

تحت رعاية صاحب السمو الشيخ محمد بن زايد آل نهيان، رئيس دولة الإمارات العربية المتحدة
Under The Patronage of H.H. Sheikh Mohamed Bin Zayed Al Nahyan, President Of The United Arab Emirates



Host



Decarbonisation Guide

ADVANCING THE DECARBONISATION AGENDA FROM GOALS TO ACTION

2-5 October 2023

Abu Dhabi, UAE

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WELCOME NOTE

Christopher Hudson
President – dmg events

The global challenge of climate change, coupled with rising energy demand, calls for urgent, collective action and game-changing solutions and partnerships. Every government, industry, business and individual has a role to play in decarbonising quicker and creating the energy system of the future, faster, while safeguarding energy security and ensuring nobody is left behind.

It is against this backdrop that ADIPEC 2023 takes place this year, under the theme of ‘Decarbonising. Faster. Together.’, with a renewed and strengthened purpose to unite industry, decision-makers, innovators and financiers to accelerate decarbonisation through innovation and collaboration.

Decarbonisation is at the heart of ADIPEC, permeating the entire event, from the cutting-edge conference programme to the innovative exhibition and exciting new features.

I am particularly excited about the all-new ADIPEC Decarbonisation Accelerator this year - a dedicated area that enables organisations to showcase their game-changing projects and solutions driving decarbonisation at scale, sparking the disruptive thinking needed to accelerate energy progress.

In another first for ADIPEC, I am also pleased to introduce the ADIPEC Decarbonisation Guide, which spotlights our exhibitors’ decarbonisation initiatives and solutions. The guide is intended to showcase the responsible actions we, as an industry, are taking, and the progress we are collectively making towards lowering emissions and supporting global energy and climate goals, ultimately for the benefit of humanity at large.

The guide complements ADIPEC’s rich conference and exhibition programme, which has been designed to promote innovation and spark global, cross-sector partnerships that tackle challenges to decarbonisation in energy and beyond.

Over four days, ADIPEC’s 10 conferences will feature more than 1,600 speakers sharing diverse perspectives and approaches. On the show floor, you will have the opportunity to visit more than 2,200 companies - including 54 NOCs, IOCs, NECs and IECs, and 30 dedicated country pavilions - all showcasing the latest solutions, strategies and innovations that are defining the future of energy.

I hope you find the Decarbonisation Guide to be of great use and that your visit to ADIPEC helps to advance our shared goal of a better, more sustainable energy future.

INTRODUCING THE ADIPEC DECARBONISATION GUIDE

Built on a nearly 40-year legacy of innovation and evolution, ADIPEC 2023 takes place under the theme, ‘Decarbonising. Faster. Together.’, uniting industries, businesses and individuals, to accelerate collaborative action and credible solutions to decarbonise quicker and create the energy system of the future, today.

ADIPEC’s central focus on decarbonisation reflects our commitment to supporting the industry in its shared goal towards a cleaner, more secure and sustainable future.

To this end, ADIPEC 2023 is pleased to introduce the ADIPEC Decarbonisation Guide. One of several decarbonisation-focused special features, the guide is designed to highlight the decarbonisation offerings of ADIPEC’s exhibitors. By showcasing the decarbonisation products and solutions offered by ADIPEC’s exhibitors, the guide helps increase engagement and adoption, as well as amplify visibility and engagement among visitors and other exhibitors.

The Decarbonisation Guide will help attendees locate and identify the decarbonisation-related products and solutions they need, learn more about new areas of decarbonisation they may not have been aware of, and hear from industry leaders on their strategies and insights towards reducing carbon emissions.

With the wider energy ecosystem gathering at ADIPEC 2023, the Decarbonisation Guide will help other participants - organisations and visitors – identify and explore the innovations, services and partners that can enable them to reduce their carbon emissions in support of the global energy transition.

Committed to accelerating energy progress, decarbonisation cuts across the entirety of ADIPEC, with other new initiatives such as the ADIPEC Decarbonisation Accelerator and Decarbonisation Connect that seek to highlight the progress being made towards creating a lower-carbon, higher-growth future.

The mission for ADIPEC 2023 is clear: prioritise decarbonisation across the energy ecosystem through collaboration and innovation, while reducing emissions and fostering global economic progress.

ADIPEC'S SUSTAINABILITY COMMITMENT AND ACTIONS

ADIPEC remains committed to championing a cleaner, more secure future, placing utmost priority on advancing climate action and ensuring that sustainability runs through the entirety of the event, from our own offerings and operations to that of our participants and stakeholders.

ADIPEC has become a signatory of the Climate Neutral Now Pledge, a global programme by the United National Framework Convention on Climate Change (UNFCCC) to support global goals towards achieving a climate-neutral world by 2050.

ADIPEC has also developed a robust roadmap towards carbon neutrality and adopted an actionable Carbon Management Plan to estimate its carbon footprint and establish clear mitigation strategies.

Reducing ADIPEC's operational footprint

ADIPEC has implemented a number of initiatives and formed strategic partnerships to reduce the environmental impact of the event.

“Powered by Clean Energy from EWEC”, ADIPEC will use clean energy across all exhibition halls, as part of a partnership with Emirates Electricity and Water Company (EWEC)

External ADIPEC exhibition tents partially powered by solar energy, as part of a partnership with Aggreko

Strong focus on preserving resources and reducing waste during the event, with initiatives including the provision of shuttle buses for all visitors and working with suppliers offering clean solutions for event build-up, design and operations

Promoting sustainability amongst ADIPEC stakeholders
ADIPEC advocates for our stakeholders – including attendees, vendors, suppliers, and participants – to contribute towards improving the overall environmental impact of the event.

In line with the United Nations Sustainable Development Goals (SDGs), detailed sustainability guidelines have been introduced in our Exhibitor Manual to encourage the more than 2,200 exhibitors to adopt environmentally responsible behaviours and practices

A partnership with CHOOOSE offers all visitors access to a carbon tracking tool to track and offset their carbon emissions

Uniting nations and industries to advance climate action

ADIPEC 2023's theme of ‘Decarbonising. Faster. Together.’, reflects our overarching ambition to support the global energy transition and act as a platform for collaboration, bold commitments and collective industry action.

10 conferences and 350+ sessions curated to address some of the world's most pressing climate and energy challenges

30 dedicated country pavilions encourage global collaboration toward tackling decarbonisation and progressing the energy transition

2,200 companies from across the energy ecosystem showcase the latest strategies and innovations defining the future of energy

16 exhibition halls including four specialised areas facilitate cross-sector collaboration to accelerate energy progress

Platforming decarbonisation solutions for transformational progress

ADIPEC 2023 seeks to spark innovative thinking and platform tangible solutions driving decarbonisation and creating the energy system of the future.

The ADIPEC Decarbonisation Accelerator showcases game-changing projects and solutions driving decarbonisation at scale

The dedicated Start-up Hub presents groundbreaking technologies advancing the energy transition

The Decarbonisation Connect platforms exhibitors' decarbonisation strategies and innovations through dedicated presentations at their stands

Eight new ADIPEC Awards categories 2023 are tailored to address the need for universal access to clean and secure energy

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ADVANCING TOWARDS NET ZERO BY 2045

Musabbeh Al Kaabi
Executive Director of Low Carbon
Solutions & International Growth, ADNOC

Our “Advancing Towards Net Zero” publication charts our net zero journey and details our plans to make crucial contributions to the energy transition. Here we present our approach to integrating climate action and responsible practice within our operations and provide greater transparency on our performance, marking a new chapter in our transformational journey to a lower carbon future.

In this rapidly changing and increasingly complex energy landscape, the destination is clear: a lower carbon future.

At ADNOC, we are excited about this journey and the positive impact we can have on ensuring an inclusive and orderly energy transition, as we steadfastly hold back emissions, not progress.

FOR MORE INFORMATION, READ OUR
ADVANCING TOWARDS NET ZERO REPORT



Understanding that there is no one-size-fits-all solution in this journey, we are making strides on multiple fronts, investing in lower-carbon solutions and pushing the boundaries of innovation and technology, with an open invitation to build and strengthen global partnerships to accelerate decarbonization solutions.

We are in the top tier of the lowest carbon intensity oil and gas producers in the world, and we continue to invest in reducing the carbon footprint of each unit of energy we produce. We are decarbonizing our operations, investing in renewables, building a global hydrogen value chain, deploying innovative climate technology solutions, and advancing nature-based solutions - such as planting 10 million mangroves in the UAE by 2030.

We support the UAE's Net Zero by 2050 Strategic Initiative. To this end, we are proud of our accelerated advancement towards zero methane emissions by 2030 and ensuring net-zero operations by 2045, continuing our legacy as a responsible global energy pioneer. We have achieved a series of significant milestones over the decades, driven by the dedication and ingenuity of our talented workforce, and have our sights set on doing more. We remain committed to being the partner of choice for navigating through the global energy transition.

ADNOC'S ENERGY TRANSITION FRAMEWORK

- 1. Decarbonizing Our Operations**
Reducing our carbon intensity by 25% by 2030 and achieving net zero by 2045.
- 2. Growing our Lower-Carbon Solutions**
Supporting our customers' net zero journey by investing to grow new energy solutions and lower-carbon technologies.
- 3. Leveraging Technology & Partnerships**
Building on our track-record of global cross-industry partnerships, operational capabilities, and technology for an inclusive transition.
- 4. Promoting Biodiversity & Nature-Based Solutions**
Working with local and global partners to create a sustainable future for biodiversity and nature-based solutions to minimize impacts of climate change.

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**In this rapidly
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increasingly complex
energy landscape, the
destination is clear:
a lower carbon future.**”

- Musabbeh Al Kaabi -



Stand no. 4435
Hall 4 (Atrium)

OMV GOES FROM VALUE CHAIN TO VALUE CIRCLE FOR A DECARBONISED FUTURE

Alfred Stern, CEO of OMV AG

ADIPEC has been one of the most important fixtures in my annual calendar for many years. Not only because of our longstanding excellent partnership with Mubadala and ADNOC, but also the ongoing fruitful multilateral exchange at the pulse of issues. This is also reflected in this year's theme «Decarbonising. Faster. Together.»

The significance of energy companies has taken on a whole new dimension in the quest to combat climate change. With the importance of sustainability in mind – of which decarbonisation is a key element – we need to reduce our use of resources like fossil fuels, by replacing them with alternatives, and to find a quicker way to drive forward the circular economy. If we want to fundamentally realign towards a decarbonised society, we need not just a few but all stakeholders on board – investors, customers, employees, politicians, the media, and the public.

In our “OMV Strategy 2030 – From Value Chain to Value Circle” we describe how that will work. We have chosen a fundamentally different path and redefined our very reason for being. We analysed future global developments and asked ourselves what OMV will look like. The result is summarized in our purpose “Re-inventing essentials for sustainable living”: we see it as our duty to develop solutions to not only ensure our quality of life, but more importantly, to enable more people to share this sense of well-being with the smallest possible carbon footprint.

Stemming from this aspiration, we address the gradual replacement of fossil-based energy sources through sustainable operations in our new Energy business segment. In Fuels & Feedstock, we strive to contribute to climate-friendly mobility and materials management as a leading provider of sustainable fuels and chemical feedstocks. In the Chemicals & Materials business, we strive to become both a global provider of special polyolefin solutions and a leading company in the field of circular economy.

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If we want to fundamentally realign towards a decarbonised society, we need all stakeholders on board – investors, customers, employees, politicians, the media, and the public.”

– Alfred Stern –

While our Energy business segment is proving its worth as the financial driver of our transformation, the sustainable direction of Fuels & Feedstock and of Chemicals & Materials are taking shape. Since we presented our strategy last year, we have already taken several important steps in the new direction. We launched promising geothermal projects in Austria and Germany and entered into a joint venture agreement to develop the geothermal potential in Austria's Vienna Basin. We are successfully expanding our sustainable aviation fuels cooperations with airlines and are continually building up production at our ReOil® plant in Schwechat near Vienna, targeting a processing capacity of 200,000 t of used plastics in synthetic feedstock for the petrochemical industry by 2027.

Borealis reached quite a few milestones recently on the way to achieving its Strategy 2030 targets. Examples include the revamp of its cracker furnaces in Stenungsund, Sweden, improving its energy efficiency and reducing its CO2 footprint, or the recent signing of an agreement to acquire Rialti S.p.A., a European producer of recycled polypropylene compounds to expand Borealis' circular offering and help its customers in meeting their sustainability ambitions.

In Romania, OMV Petrom is making strides in putting into action the transition towards a cleaner and more sustainable energy future. Our final investment decision for a strategic natural gas project, Neptun Deep, in the Black Sea, will turn Romania into one of the largest gas producers in the EU. Along its low and zero carbon targets, OMV Petrom managed to secure more than one gigawatt of capacity in photovoltaic projects and is advancing with the installation of electric vehicle charging points in Romania and the region.

In view of the ever-growing threat to the climate, our Chemicals & Materials business will play a key role. With the accelerated development and production of high-quality, sustainable chemical and plastic products, we help to ensure the efficient use of resources and to increase energy efficiency of solar panels, wind farms, electricity transmission, and mobility solutions. Overall, until 2030, an average of 40 percent of our investments will be in sustainable projects.

We have made sustainability the starting point and the core element of our strategy, and therefore the foundation of our successful development. And we will clearly stick to our chosen path.

IPIECA HELPS THE INDUSTRY ADVANCE CLEAN ENERGY SOLUTIONS

By Brian Sullivan,
Ipieca Executive Director

The major challenges faced by the world's population are dependent on an orderly and just energy transition. The oil and gas industry has a significant role to play and the organisation I lead - the global oil and gas association for advancing environmental and social performance across the energy transition - is here to help. The transition needs to support the attainment of net-zero emissions while also providing access to secure, affordable, modern energy to all, ensuring the opportunities for sustainable development are available to all parts of society, everywhere.

These goals are articulated through agreements reached at the UN, the Paris Agreement and the 2030 Agenda for Sustainable Development. As the industry interface with the UN on environmental and social issues, Ipieca supports these agreements, which are enshrined in the Ipieca Principles; a condition of membership.

The transition requires the management of both future energy systems and the current energy mix. The oil and gas industry has a role to play in this to reduce operational emissions associated with production and supply and to support a reduction in emissions associated with energy use. Energy transition features strongly in Ipieca's strategy as part of our vision and through key elements of our work programme. Operational emissions have been a focus of the industry for some time. Key opportunities are centred on energy consumption by the industry, through increased energy efficiency and electrification; by eliminating routine flaring and eradicating methane leakage. Increasing numbers of companies have made public their aims to achieve net-zero emissions. Companies and countries have signed up for the World Bank's Zero Routine Flaring by 2030 initiative, and the recently launched Aiming for Zero Methane Emissions initiative, led by the Oil and Gas Climate Initiative (OGCI), is gaining momentum. Ipieca supports this by providing a forum for members to share knowledge and good practice.

Within our Climate Change Group, we have work programmes sharing and promoting good practices and developing guidance for the whole industry on net-zero targets; energy efficiency; methane emissions; and flaring. We work with several partner organisations on this such as the World Bank's Global Gas Flaring Reduction Partnership, OGCI, and the International Association of Oil and Gas Producers.

Moving beyond operational emissions, the industry is actively pursuing scale-up of technologies to address emissions associated with energy consumption. Ipieca members are investing in technologies such as CCUS, direct air capture, natural climate solutions, low-carbon energy technologies and renewable energy, for their use, but also as new business models. Ipieca companies are planning to add over 200 gigawatts of renewable energy capacity by 2030.

Despite these being relatively new technologies at scale, the oil and gas industry has a huge wealth of relevant knowledge, skills and expertise that can contribute to their sustainable scale-up. Its experience and knowledge also extend to ensuring that as carbon sequestration technologies and low-carbon energy sources scale, they are underpinned by the highest environmental and social practices. Ipieca has produced a compendium mapping our library of good practice guidance to a range of energy technologies and we have current workstreams looking at environmental and social good practices tailored to renewable energy scale-up.

Finally, the transition to a lower-carbon world must be just and fair for workforces, communities and consumers. This will require collaboration between governments, employers, businesses, unions, communities, civil society, UN agencies and other international organisations. A just transition will need to address impacts on those who currently depend on the oil and gas industry for jobs and energy, or benefit from its social investments. It will also need to address the impacts of new types of business, promote long-term opportunities for decent work and sustainable livelihoods and make lower-carbon energy affordable and reliable for developing nations as well as developed countries. Ipieca, our members and our partners are working hard to support these aims.

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- Brian Sullivan -

Stand no. 6230
Hall 6

JODCO TAKES THE LEAD IN CLEAN ENERGY SOLUTIONS

Hiroshi Fujii, President & CEO of JODCO, speaks about the company's net zero businesses that aim to support the energy transition and ADIPEC's critical role in accelerating collective action to decarbonise the industry

How are you focusing on the energy transition and helping the industry advance clean energy solutions?

Early last year, INPEX Corporation, the parent company of JODCO, announced its long-term strategy and medium-term business plan called INPEX Vision@2022. The vision reflects our policy towards a net zero carbon society by 2050, which consists of a two-pronged approach. We will continue to focus on our core business of developing and producing crude oil and natural gas to maintain and expand a stable supply of energy while making the business cleaner. Meanwhile, we will grow our five net zero businesses, which include hydrogen/ammonia, CCUS, renewable energy, methanation and forest conservation, allocating a portion of the revenue from our oil and gas business to invest in these businesses. These businesses are positioned to support the energy transition and generate clean energy solutions, and some of our related initiatives are based in Abu Dhabi, like our clean ammonia supply chain linking the UAE and Japan and this year's agreement between Masdar and INPEX to evaluate the production of synthetic methane (e-methane) using green hydrogen and CO₂.

In your view, what are the opportunities for the industry brought about by the decarbonisation of the energy sector?

We recognise that the decarbonisation of the energy sector presents challenges as well as significant growth opportunities for our industry. Leveraging our expertise in our core business of oil and natural gas development, we are committed to advancing net-zero businesses. We are determined to address the energy trilemma and pioneer clean energy solutions. By embracing these opportunities, we can drive innovation, expand into new markets, and contribute to a sustainable and decarbonised future for the energy industry. One area where our existing capabilities can be fully applied is CCS/CCUS, especially targeting depleted oil and gas fields.

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We recognise that the decarbonisation of the energy sector presents challenges as well as significant growth opportunities for our industry.”

– Hiroshi Fujii –

Could you elaborate on any innovation, projects or initiatives undertaken by your company that contributes to a lower carbon future?

In addition to the clean energy projects in Abu Dhabi, we are driving some key initiatives in our core business areas including the following: INPEX recently acquired 50% of shares in Enel Green Power Australia (EGPA), expanding into diverse renewable energy markets leveraging wind, solar, battery storage and hybrid projects across Australia. In Japan, INPEX commenced construction of the Kashiwazaki Clean Hydrogen/Ammonia Project, through which we will build an integrated hydrogen and ammonia value chain utilising natural gas to produce hydrogen, synthesise ammonia and contribute to a low-carbon society. In Europe, INPEX's Snorre Project in Norway recently began receiving some of its power from the Hywind Tampen floating wind farm, which will reduce CO₂ emissions by about 200,000 tonnes per year.

How critical is the role of ADIPEC in accelerating industry action to decarbonise faster together?

ADIPEC plays a critical role in accelerating collective industry action to decarbonise and drive investments into clean energy. With the UAE being the first oil-producing country to aim for net-zero by 2050, ADIPEC has become a platform for showcasing energy transition initiatives and facilitating leadership dialogue. ADIPEC can actively promote the energy transition while leveraging existing energy resources and contribute significantly to shaping a sustainable and cleaner energy future by advocating faster and more collaborative decarbonisation efforts.

What are the services and technologies that you are looking to showcase at ADIPEC this year?

This year, we will showcase our clean energy projects as well as new generation chemical water shut-off technology, for which we were jointly awarded earlier this year. As in previous years, we will also be offering Japanese-style hospitality, providing a traditional tea ceremony service to visitors.

Stand no. 8320
Hall 8

KNOC CHARTS A COMPREHENSIVE PATH TO DECARBONISE THE REGION

Dongsub Kim, CEO of Korea National Oil Corporation (KNOC), talks about finding low-carbon solutions while maintaining the company's hydrocarbon business in view of energy security, and creating carbon capture utilisation and storage (CCUS) and ammonia hubs to decarbonise the region.

Can you tell us more about Korea National Oil Corporation and its strategy for the energy transition?

The world is facing an energy trilemma and we must find solutions to resolve energy security, affordability, and sustainability. While renewable energy is growing fast, oil and gas reserves should also be maintained and added. Thus, developing low-carbon energy and finding low-carbon solutions while maintaining our hydrocarbon business for national security has become the Korea National Oil Corporation's (KNOC) strategy. Based on our strengths and experiences, KNOC is expanding its low-carbon businesses in CCS, hydrogen and floating offshore wind farms. Korea will become one of the biggest consumers of hydrogen and ammonia. We will continue to develop applications of hydrogen and ammonia and ways to transport and stock them by collaborating with global energy companies including ADNOC. KNOC's portfolio should be aligned with the national energy policy for optimal energy mix and therefore we keep on communicating with government.

Could you elaborate on any innovation, projects or initiatives undertaken by your company that contributes' to a lower carbon future?

In 2022, KNOC and ADNOC signed a JSA to perform a feasibility study for clean ammonia production in Abu Dhabi before moving on to FEED stage and is working on the construction of ammonia receiving terminals and processing facilities. KNOC is also developing Korea's first large-scale carbon capture and storage (CCS) demonstration project. Simultaneously, KNOC is exploring additional storage formations near the gas field and in other offshore basins to create a comprehensive CCUS hub to decarbonise the region.

Korea is well known for its manufacturing industries. Making a good use of abundant CO2 coming from industries, we have huge opportunities to reduce CO2 by commercialising CCUS. KNOC envisions establishing a platform for CCUS by creating CCUS hubs, for which it requires international collaboration. In 2023, KNOC has signed an MOU with ExxonMobil to collaborate in CCS, hydrogen and ammonia business. It is also involved in developing a 200MW offshore floating wind farm project with Equinor. I strongly believe the technological innovation and digital transformation we are applying will accelerate the energy transition in Korea.

In your view, what are the opportunities for the industry brought about by the decarbonisation of the energy sector?

Decarbonisation is an essential task for our future. This will create new business opportunities for the energy industry. I believe the energy industry already possesses various competencies and possibilities that can be applied for finding low-carbon solutions. For instance, offshore wind farms and CCS also provide opportunities for oil companies since these projects have value chains that are similar to oil exploring mechanisms. Cross-industry, digitalisation can provide new and innovative methods to reduce CO2, which requires collaboration across sectors and industries. In line with this, a platform such as ADIPEC becomes invaluable to gather people and call for collective actions, seizing the opportunities brought by the decarbonisation of the energy sector.

How critical is the role of ADIPEC in accelerating collective industry action to decarbonise faster, together and driving investments into the clean energies of the future?

I strongly believe that ADIPEC will provide actionable solutions to reduce CO2 while maintaining economic growth, energy security and affordability. The unprecedented and abnormal climate calls for the urgent need to accelerate the energy transition. Connecting industrial leaders to drive investments in the right places is also ADIPEC's key role. At the end of the day, ADIPEC gets to diagnose, promote, and upgrade decarbonisation worldwide. It fosters collaboration among stakeholders, facilitates networking, and leads to impactful partnerships and initiatives to inspire concrete actions towards a sustainable future.

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Based on our strengths and experiences, KNOC is expanding its low-carbon businesses in CCS, hydrogen and floating offshore wind farms.”

- Dongsub Kim -

HYDROGEN IS PART OF OUR FUTURE – LET’S GET STARTED

By Samantha Gross,
Director – Energy Security and Climate Initiative
& Fellow, Foreign Policy, Brookings Institution

Hydrogen can be a key component of the world’s goal of achieving net-zero greenhouse gas emissions by 2050. However, we must keep in mind what hydrogen is, as we think about where it makes sense in our changing energy system.

Hydrogen is not a fuel like oil, coal, or natural gas. Instead, it is an energy carrier like electricity, made from other forms of energy. The advantage of hydrogen is that it has many of the useful properties of a fuel. It can be burned to produce high heat for industrial processes. Hydrogen can be stored and shipped via pipelines or ships, sometimes in the form of hydrogen carriers like ammonia since hydrogen molecules are tiny and difficult to handle. Hydrogen carriers have a higher energy density than electricity stored in a battery, making them suitable for long-distance transport like marine shipping. Hydrogen can serve as a decarbonisation pathway when certain properties of fossil fuels are necessary and other pathways don’t work or are prohibitively expensive.

Today, most hydrogen is made from natural gas, splitting the methane atom to produce hydrogen and carbon dioxide as a waste product. Future hopes for hydrogen lie in splitting water atoms using electrolysis instead, producing hydrogen along with oxygen instead of carbon dioxide. To be zero carbon, carbon dioxide associated with the process must be captured or electrolysis must use zero-carbon electricity.

The facts of zero-carbon hydrogen seem relatively straightforward, but the politics and understanding around developing the hydrogen economy are not. I’m frequently asked if hydrogen is the fuel of the future, and generally begin the discussion by stating that hydrogen isn’t even a fuel. In applications where electricity can be used directly, it should be. The extra step of transforming electricity into hydrogen makes no sense in such applications since transformation always involves energy losses. (The laws of thermodynamics have not been repealed for the energy transition.) Hydrogen only makes sense when you need its special qualities and electricity won’t do.

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The facts of zero-carbon hydrogen seem relatively straightforward, but the politics and understanding around developing the hydrogen economy are not.”

– Samantha Gross –

Additional policy arguments centre on how to get the new industry off the ground. To be truly green, you want hydrogen produced via electrolysis to use carbon-free electricity all the time. But practically, such projects are unlikely to be paired directly with renewable projects and operate only when those projects are generating electricity. Running hydrogen generation that way would be prohibitively expensive and fail to take advantage of the fact that renewable energy works best when it is spread across geography. In the future, producing hydrogen from a zero-carbon grid makes sense, but how do we get from here to there?

Insisting on pairing renewable generation with hydrogen production on an hourly basis is likely to strangle the nascent clean hydrogen industry. To produce hydrogen efficiently at low cost, electrolyzers need to run constantly, a constraint at odds with pairing them directly with intermittent renewable generation. For now, ensuring that enough new zero-carbon generation is added to the grid to cover demand from hydrogen production can help the industry get off the ground. This challenge is analogous to many businesses today that purchase credits for enough renewable power to cover their overall demand. These practices, both from hydrogen production and other businesses, increase demand for renewable power, a noble goal when the US grid is still 60% fossil-powered and the EU grid is at about 40% fossil.

This constraint should be tightened over time to ensure that green hydrogen is truly zero-carbon. Just as businesses are moving from procuring green power on an annual basis to 24-7 green power, the hydrogen industry must do the same as a greener grid makes such a policy possible. But in the meantime, we must not strangle a necessary industry by letting the perfect get in the way of the good.

Stand no. 8230
Hall 8

NEW TECHNOLOGIES TO DECARBONISE ENERGY PRODUCTION IN THE MIDDLE EAST

By Tush Doshi, Chief Operating Officer, Kent

A successful energy transition will end with the global energy supply being predominantly sourced from commodities other than coal and hydrocarbons. But given that it has taken us well over 100 years of oil and gas to get to where we are today, making that shift is going to take time and money.

The Middle East is known for its significant oil and gas reserves, which have been the backbone of its energy production and export. However, many Middle Eastern countries have also been actively investing in and developing clean energy initiatives with a view to becoming global leaders in renewable energy. In the past year, the UAE has announced plans to triple its renewable energy sources with a \$54 billion investment (Bloomberg, 2023) and Saudi Arabia has announced plans to invest around \$266 billion into clean energy (Reuters, 2023) – both citing the intention to introduce clean hydrogen into their energy mix.

Decarbonising conventional energy

Historically, oil and gas have been the primary source of revenue and energy for many countries in the region. However, continued reliance on fossil fuels contributes significantly to greenhouse gas emissions and climate change. Reducing emissions in these fossil fuel-rich countries can be challenging, as it requires a careful balancing act between transitioning to cleaner energy sources and managing their economic dependencies on oil and gas exports.

At Kent, we've been helping oil and gas operators assess and reduce their greenhouse gas emissions by providing a clear cost/benefit analysis of various emission reduction options using our award-winning Carbon Intensity Reduction Tool. Drawing upon our extensive expertise in asset planning, brownfield modifications, and asset life extension, using the Kent Carbon Intensity Reduction Tool, we can accurately simulate and assess the impact of operational and physical modifications on an asset's emissions and production. By providing a detailed offline evaluation, we offer a safe and comprehensive environment to explore different scenarios and fine-tune emissions reduction strategies.

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Developing roadmaps that allow clients to monitor their emission reductions in a step-by-step approach, we are helping them identify a timeline of events for creating a comprehensive plan. ”

– Tush Doshi –

By evaluating these options based on technical and economic criteria, we prioritise and rank them, ensuring a holistic approach to achieving sustainability goals thus enabling our clients to make well-informed investment decisions for life-of-asset. Thanks to its effectiveness, our Carbon Intensity Reduction Tool has also become a crucial component of our concept and select studies. Developing roadmaps that allow clients to monitor their emission reductions in a step-by-step approach, we are helping them identify a timeline of events for creating a comprehensive plan.

Opportunities for new energy

The Middle East is prime for developing a clean hydrogen value chain, something these countries have recognised and committed to investing in. However, implementing effective and economically viable low-carbon projects like hydrogen can be challenging due to unique production methods and associated complexities. Evaluating an ever growing supply of new technologies, lack of infrastructure and scalability are a few of the hurdles to overcome to unlock the full potential of hydrogen as a clean energy carrier. Abundant renewable resources, lower cost of production, strategic location for export, economic diversification, and energy transition goals in this region make hydrogen production an attractive option. Early signs of collaboration can already be seen with the Green Hydrogen Company at NEOM in Saudi Arabia planning to supply clean hydrogen to European buyers. At Kent, Hydrogen is not a new concept. We have been working with hydrogen on a large scale for over 50 years, gaining valuable insights into its production, handling, and use. We are using that experience to evaluate and recommend the latest technologies, pioneer new concepts, help clients gain permitting and financial decisions, and design end-to-end project solutions that drive the development of the clean energy solutions our world needs. Our deep knowledge of technologies and industrial processes gives us the authority to produce bankable engineering packages and deliver low-carbon projects safely, on time and to quality.

Stand no. A300
Hall Atrium

BUILDING THE SUSTAINABLE ENERGY SYSTEM OF THE FUTURE

Claudio Descalzi, CEO of Eni, outlines how the company is balancing energy security with tackling environmental sustainability challenges, Eni's projects and collaborations in decarbonisation, the strategic pillars of the Eni and ADNOC partnership, and much more.

How is Eni focusing on the energy transition and helping the industry advance clean energy solutions?

The energy transition requires addressing the urgency of climate change, without negative impacts on energy security and affordability, enabling industries and infrastructures to transform. As an energy company, Eni is aware that we must build a new, more resilient and redundant system to preserve the competitiveness of the economic system.

In 2023 Eni confirmed its key medium-to-long-term emissions targets: the pathway towards Eni's carbon neutrality by 2050 first envisages net-zero scope 1+2 emissions by 2035, with a plan to reach -35% of absolute carbon emissions, including Scope 3, by 2030 and -80% by 2040 (baseline 2018). Eni's strategy to reach carbon neutrality leverages an industrial transformation that strengthens available and economically sustainable technologies with a neutral approach. Our strategy is grounded on a continuous focus on new technologies and their fast-tracked deployment.

At the same time, we believe that natural gas is a "bridge" energy source in this transition path. Gas is the fossil fuel with the lowest carbon footprint capable of ensuring energy security: it is a programmable source that can support the penetration of renewable energy and the development of new energy solutions. Recognising this crucial role of gas, Eni has long been committed to reducing methane emissions.

Tell us about the strategic pillars of the Eni and ADNOC partnership, also looking at the latest agreement signed earlier this year.

Eni has been present in the UAE since 2018 with a significant portfolio of activities. The Eni and ADNOC partnership spans from exploration, production and development initiatives in the upstream sector, to downstream activities. Last March, we signed a cooperation MoU through which Eni and ADNOC will explore potential opportunities in renewable energy, blue and green hydrogen, carbon dioxide capture and storage (CCS), reduction of greenhouse gas and methane gas emissions, energy efficiency, routine gas flaring reduction and the Global Methane Pledge, to support global energy security and a sustainable energy transition.

Could you elaborate on Eni's projects and collaborations in decarbonisation? Is decarbonisation of transport a strategic focus area for Eni?

The development of bio-energy has an important potential for decarbonising the transport sector. One of the distinctive elements of Eni's strategy is the innovative vertical integration along the biofuel value chain based on the construction of agri-hubs to produce vegetable oils from raw materials that do not compete with the food chain, to be used in Eni's biorefineries to produce biofuels.

For light transport on the road, biofuels are necessary to decarbonise the vehicle fleet and to integrate electricity solutions during the path to fully develop the charging infrastructure and the growth of the renewable share in the electricity mix. For heavy transport by road, sea and air, they are indispensable, given the difficulty of electrification of these sectors and the low maturity of other solutions.

Another crucial element for the success of the transition is, therefore, the partnerships with hard-to-abate sectors. In this sense, a fundamental lever of our decarbonisation strategy is the capture and storage of CO₂, which can play a key role in decarbonisation already in the short term.

“
Gas is the fossil fuel
with the lowest carbon
footprint capable
of ensuring energy
security...”

- Claudio Descalzi -

What are you particularly looking forward to at ADIPEC this year?

ADIPEC plays a critical role in accelerating collective industry action to decarbonise and drive investments into clean energy. With the UAE being the first oil-producing country to aim for net-zero by 2050, ADIPEC has become a platform for showcasing energy transition initiatives and facilitating leadership dialogue. ADIPEC can actively promote the energy transition while leveraging existing energy resources and contribute significantly to shaping a sustainable and cleaner energy future by advocating faster and more collaborative decarbonisation efforts.

What are the services and technologies that you are looking to showcase at ADIPEC this year?

ADIPEC is one of the world's most influential meeting places where energy players and professionals come together to discuss all the main topics in the energy sector. This year, it also comes at a crucial time, in a complex international juncture and in view of the upcoming COP28, where the UAE, as hosting country, is expected to set out its vision for a clean energy transition agenda.



HALLIBURTON LEADS THE FUTURE OF ENERGY

Jeff Miller, Chairman, President, and CEO
of Halliburton

As one of the world's leading providers of products and services to the energy industry, Halliburton comes to ADIPEC 2023 ready to showcase our successes in enabling energy security, hiring and training local talent, and accelerating decarbonisation.

For more than 100 years, Halliburton's innovative technologies and sustainable solutions have helped oil and gas customers around the world achieve tremendous success. We have been working in the Middle East for 60 years, and today we help our customers here maximise value throughout the lifecycle of an asset, from locating hydrocarbons and managing geological data, to drilling and formation evaluation, well construction and completion, optimising production, and intervention solutions for successful abandonment. With our integrated drilling solutions, we use the latest technologies that help reduce a customer's total cost of ownership by drilling longer wells that maximise reservoir contact. Development and deployment of lower carbon-intensive solutions allows Halliburton and our customers to achieve emissions reduction targets while providing critical energy resources.

For example, we recently achieved two major milestones in the Middle East. First, we successfully drilled one of the longest wells ever – with a measured depth of more than 51,000 feet – using our iCruise Intelligent Rotary Steerable System, iStar Intelligent Drilling and Logging Platform, and LOGIX Autonomous Drilling Platform technologies. Next, we successfully installed the industry's first 12-zone completion for a Middle East offshore customer using our SmartWell Intelligent Completion System technology on our e-Completions platform.

Halliburton Chairman, President, and CEO, Jeff Miller will speak on the first day in the ADIPEC panel, "Transforming Upstream Portfolios to Secure Lower Carbon Solutions." He will highlight Middle East successes and share his insights on how energy companies can meet global targets while addressing emission offsets and accelerating energy progress. Join Halliburton at ADIPEC from October 2 – 5 in Hall 5, booth #5250 to learn more about how we are leading the future of energy.

“

**For more than 100 years,
Halliburton's innovative
technologies and sustainable
solutions have helped oil and
gas customers around the
world achieve tremendous
success.** ”

– Jeff Miller –

THE WAY FORWARD FOR HYDROGEN IS ‘SQUIGGLY’

By Daryl Wilson, Executive Director
of the Hydrogen Council

I was riding the London Underground recently when I noted this British term as the title of a new career book: squiggly. A term often used to describe a line that curves or twists in a way that is not regular. The squiggly line urges one to deviate from the ordinary and venture into uncharted territories. Human nature does not prefer squiggly, but squiggly is truer to reality than we would like to admit.

Just like this undulating line represents continuous growth and change, the same comparison can be drawn to hydrogen. After a very rapid, dare I say linear, rise of hydrogen in the past few years, we are now into the reality of squiggly. Uncertainty reigns in policy, funding, permitting and public sentiment on many fronts, making the way forward not easy. Faced with uncertainty, there is a strong temptation to stop and wait for the clouds to clear, but inaction is not the answer. There are some actions that just make sense no matter what happens.

Getting together, driving cost down and concentrating efforts are three key vectors of action under uncertainty. Efforts around innovation and cost reduction are also critical under all scenarios. Focusing and concentrating efforts are also key. Hydrogen ports and valleys need to further coalesce into thoughtful ecosystems involving multiple hydrogen applications clustered around supply and demand. Embracing the ecosystems way of thinking is vital at this stage. While the rapid growth of the project roster is exciting, an unconnected mess of super demonstration projects does not make the coherence of our future energy system.

“
A holistic complete
vision of beginning
with the end in mind
is needed.”

– Daryl Wilson –

A holistic complete vision of “beginning with the end in mind” is needed. There are three elements of this ecosystem approach I would like to highlight here:

1 Minimum viable starts: In June, I had the opportunity to stand aboard the Suiso Frontier, the world’s first liquid hydrogen carrier ship. This is the culmination of a vision conceived five years ago and the foundation for the first-ever international trade in liquid hydrogen. It is a great example of “a minimum viable start”. Through the work of a consortium of companies in Japan and Australia, the project has proven that “it can be done” and that some of the previously never accomplished aspects of port infrastructure are possible. The long-term dividends for large-scale change are enormous.

2 Diversity, teamwork and collaboration are essential: The scale and pace of change that needs to be sustained in overcoming climate change demands no less. There is no one company or government that can undertake all the jobs required. Over the past six months, Hydrogen Council members have concentrated their efforts on building the vision and foundation for multiple hydrogen ecosystems. If we are going to build elegant functional and cost-effective future energy systems, it will require the work of good design arising from strong teams.

3 Step-by-step: Thoughtfulness around what needs to be accomplished in each step of the ecosystem journey is the way we will make the most progress. What are the most essential things to learn, to prove, to test, to confirm now? This forms the basis of effective and expedient next step action. The harder work is to formulate what to do next. I mention many of the items above as a backdrop to the upcoming ADIPEC exhibition and conference in Abu Dhabi from October 2-5. It is here the “squiggly journey” can find its way. The collaboration between major energy players and governments is just the type of “convening” that needs to happen right now. The theme for this year’s ADIPEC – Decarbonising. Faster. Together. – speaks well to resolving what to do amid uncertainty, having the right conversations and collaborating on the ecosystems we need to build.

HOW OIL & GAS OPERATORS MEET A KEY CLIMATE CHALLENGE

By Mark Brownstein,
Environmental Defense Fund,
Senior Vice President, Energy Transition

Greenhouse gas pollution from burning fossil fuels is driving unprecedented warming. The costly and dangerous effects of record temperatures and extreme weather are everywhere. No corner of the world is untouched.

The answer is to stop putting carbon dioxide, methane and other greenhouse pollutants into the atmosphere. We need an effective energy transition. And we need it fast.

As world energy leaders gather in Abu Dhabi for ADIPEC — a premier industry event hosted only weeks before the UAE hosts the COP 28 UN global climate talks — the industry faces an important moment to show it is serious about addressing a powerful pollutant: Methane.

Methane isn't the most plentiful greenhouse gas, but it packs a big punch. When released unburned, it has 80 times the warming potential of carbon dioxide over the first 20 years. Methane from fossil fuel operations, agriculture and other sectors is responsible for about 30% of today's warming.

Researchers from Environmental Defense Fund and others have found far more methane is emitted from energy infrastructure than companies or countries report, severely undercutting industry claims that gas is a 'clean' fuel.

“
We need an effective energy transition. And we need it fast.”
– Mark Brownstein –

And methane pollution is more than an environmental problem. According to the International Energy Agency, more than 260 billion cubic meters of methane is lost every year through flaring, vents and leaks. This is a tremendous waste of an energy resource at a time when the world is scrambling to secure new sources of gas to meet current energy demands.

The good news is that this is a very solvable problem.

The International Energy Agency says the oil and gas industry can feasibly cut its methane emissions 75% using technologies available right now — much of that at no net cost. Leading oil and gas companies like ADNOC, our ADIPEC host, have committed to virtually eliminating methane emissions by 2030, and are actively implementing the technologies and practices to make this happen.

What's now needed is for all oil and gas companies to embrace their methane challenge. To seize this opportunity, operators should start with an honest accounting of emissions — using actual field measurements rather than the traditional practice of engineering estimates — and report those figures in the same transparent way they would any material business information. Then set concrete goals, make them public and continue to use real data to measure progress.

The principal industry forum for companies committed to eliminating methane emissions is the Oil and Gas Methane Partnership (OGMP), a U.N.-backed initiative that gives operators a standardized platform to set emission reduction targets, report emissions, and credibly share their actions and results with the public.

More than 100 companies responsible for over 35% of global oil and gas production have committed to measuring and reporting their methane emissions through OGMP. But that leaves out nearly two thirds of the world's production. It is time for all producers — especially the largest, national oil companies responsible for half of global production — to join their OGMP peers in this critical endeavor. The framework is developed, and the standards are set and ready.

Advancements in remote-sensing technologies, including satellites, can help industry develop more accurate inventories and improve quality of reporting. Companies that embrace this new level of data transparency and accuracy early will have a running start.

Several methane-measuring satellites, such as GHGSat and TROPOMI, are already in orbit. Next year EDF subsidiary MethaneSAT will launch the most advanced Earth observation satellite in monitoring and studying global methane emissions. It is a new tool operators can use to measure, track and report their emissions at unparalleled scale, precision and frequency.

Reducing methane is an immediate opportunity producers should not miss. The rewards are right there, right now, ready for the taking. And the Dubai COP is a crucial, time-limited window for the industry to demonstrate it is capable of stepping up with strong actions that can eliminate greenhouse gas pollution this decade.

Stand: 7152
Hall: 7

HIGHLIGHT COMPANIES OFFERING TECHNOLOGY, SOLUTIONS OR INITIATIVES RELATED TO DECARBONIZATION OR HAVE IMPLEMENTED DECARBONIZATION INITIATIVES/PROJECTS.

Wood is partnering with clients to define the right path forward to achieve their carbon reduction goals. Dan Carter, President of Decarbonisation at Wood, explains how Wood enables clients to take decarbonisation off the page, turning theory into practice; to get the most from their investment, navigate and leverage global policy changes and deliver an impactful low-carbon strategy.

Designing a low-carbon future.

Decarbonisation is a global imperative if we are to address climate risks and design a more sustainable future. It's going to take speed, scale and smart solutions to deliver a net zero world.

As world leading consultants and engineers, we understand our clients' assets intimately because we have decades of experience in designing and building them.

Our remarkable team of experts excel in the complex – and a practical approach to decarbonisation at pace, is one of the most complex challenges of a generation.

A world-class offer

We have an industry-leading decarbonisation offer. Put simply, we combine advisory and technical expertise to design, implement and deliver effective carbon management solutions. This blended approach of advisory and implementation is important as our clients are often at different phases in assessing challenge areas relating to their carbon reduction goals and therefore need a range of solutions. Within our advisory offer, we help our clients to identify and fully scope their biggest challenges. We define their baseline and lifecycle emissions, set targets and then develop a roadmap and action plan to help reduce.

On the implementation side, we group solutions around the options clients typically have when it comes to decarbonising their portfolios; substituting hydrocarbons with lower-carbon alternatives, capturing emissions before they're emitted into the atmosphere, and reducing emissions through infrastructure improvements or process optimisation activities.

Decarbonisation solutions in action

Advisory

We have worked with a leading energy company to develop a five-year roadmap to identify how to reduce emissions from one of their gas basins in Southeast Asia. Ten initiatives, encompassing traditional engineering modifications and digital solutions, were prioritised that could deliver a 13% reduction in Scope 1 emissions, helping to abate over 225,000 tons of CO2 – the equivalent of 45,000 cars – and generating over US\$30m net present value (NPV) benefit.

Similarly, with one NOC client in the Middle East, we assessed options

to reduce emissions intensity on one of their developments. We identified an opportunity to reduce Scope 2 emissions by 130,000 tonnes a year through the introduction of an emissions monitoring and optimisation solution.

Substitute solutions

We are pioneering new solutions to help power operational assets from lower-carbon sources – we have completed electrification scopes on the Bul Hanine field in Qatar and in Europe, and we're modifying some of Equinor's Hywind Tampen platforms so they can be powered using offshore wind. In hydrogen, we have an outstanding track record, having designed and built over 130 plants in over 40 countries over the last 60 years. In the UAE, we are currently working with ADNOC to design a world-class facility that will produce one million tons of blue ammonia a year.

Capture solutions

We are pioneering in the carbon capture and storage (CCS) space, having completed over 175 studies across the globe over the last 40 years, and are involved in some of the industry's most complex projects.

We are currently delivering one of the world's largest CCS hubs in the Middle East; we are designing a 400km long pipeline to transport CO2 in Canada; and are working on a 'first-of-a-kind' project at a UK industrial cluster to define how to safely capture and move CO2 from multiple emitters.

Optimising assets to reduce emissions

With one operator in the Middle East and North Africa region, our engineering modifications helped to reduce flaring from one of their offshore facilities. This helped to remove four million tonnes of CO2 entering the atmosphere each year, representing 1% of the total volume of global flaring.

We are carrying out similar work with another major client in the Middle East and the gas that had historically been flared, is now being captured and monetised and used to support economic development across the country.

We also offer an industry-leading methane mapping and analysis solution. 'Iris Edge' enables clients to identify, quantify and visualise any leaks. Given methane is 25x times more potent than CO2 in trapping heat in the atmosphere, this type of solution will be key in supporting the journey towards net zero.

Wood's decarbonisation team will be 'On Air at ADIPEC', participating in live podcasts on stand 7152.

“

Decarbonisation is a global imperative if we are to address climate risks and design a more sustainable future. It's going to take speed, scale and smart solutions to deliver a net zero world.”

- Dan Carter -



HEAR FROM 1,600 INDUSTRY LEADERS AT ADIPEC CONFERENCES

350+
SESSIONS

1,600
SPEAKERS

7
STRATEGIC
CONFERENCES

3
TECHNICAL
CONFERENCES

DECARBONISATION STRATEGIC CONFERENCE THEMES

Global collaboration, funding and government-led actions from across the energy value chain and the broader industrial ecosystem will be crucial to a clean energy transition. The focus of this year's programme will provide critical insights on the following themes:

Reinforcing regulatory systems to guide and accelerate emissions reduction

Setting clear-cut standards and policies is vital to allow businesses to make long-term plans for emission reduction efforts to succeed. Ambitious targets, robust measuring, reporting and verification systems, innovation and commercialisation incentives, enforcement and market-making mechanisms, public participation, and international cooperation are all key elements in establishing a regulatory framework for a new industrial base that can effectively support businesses in reducing their emissions.

Driving investment in new technology to scale down the cost of clean energy

Transforming the world's energy systems through the deployment of carbon reduction technologies and solutions involves substantial investment in clean energy infrastructure. Driving technological advances will be crucial to delivering accessible and affordable green energy.

STRATEGIC CONFERENCES

- Strategic Conference
- Hydrogen Strategic Conference
- Decarbonisation Strategic Conference
- Manufacturing & Industrialisation Strategic Conference
- Maritime & Logistics Conference
- ADIPEC Forum For Diversity, Equity And Inclusion
- Future Leaders Programme

TECHNICAL CONFERENCES

- Technical Conference
- Downstream Technical Conference
- Manufacturing & Industrialisation Technical Conference

Enhancing grid infrastructure to unlock the potential of renewables and low-carbon solutions as energy sources

Renewable energy and low-carbon solutions have the potential to significantly reduce energy dependence on fossil fuels and help mitigate the impacts of climate change. Establishing diversity in energy sources is a key factor to meet the challenges of energy supply and demand, and improving grid infrastructure will play a vital role in unlocking this capability.

Decarbonising end-use and heavy-industry sectors

The decarbonisation of heavy-industry sectors present unique challenges of their own. Recognising the capabilities of energy efficiency, electrification, and new energy carriers as key enablers in the energy system opens opportunities for effective, tailored solutions to decarbonise operations across heavy-emitting sectors.



Monday 2 October 2023

OPENING KEYNOTE ADDRESS

12:00 - 12:15

Location: Conference Room B

Decarbonisation outlook: the pathway to net-zero

The United Arab Emirates is taking centre stage with decarbonisation at the forefront of its efforts to address clean energy security and deliver a just energy and equitable transition and long-term sustainability. Its commitment to decarbonise the energy sector is propelled by a national drive to achieve net-zero emissions by 2050. In what ways can government and industries work together in collaboration with civil society to achieve decarbonisation objectives?

Attendee insights

Gain insights into the UAE's recent steps towards achieving decarbonisation and how every stakeholder across the energy sector can contribute to its success.

STRATEGIC PANEL

12:15 - 13:15

Location: Conference Room B

Addressing the invisible: driving down value chain emissions in the energy sector

Tackling value chain emissions can help organisations progress in their decarbonisation and sustainability journey, but collecting and tracking these emissions is inherently difficult without reliable data. Energy companies prioritising value chain emissions reduction are facing challenges such as obtaining an accurate measure of current emissions, lack of reporting standards and policies, and transparency between supply chain partners. An alignment amongst companies, suppliers and end-users must be set in place to effectively advance each of their individual and shared mitigation targets.

Attendee insights

Understand the importance of standardising the process of measuring emissions across the value chain and why positive engagement and collaboration between businesses and stakeholders are the first steps for mitigation strategies to work.

LEADERSHIP PERSPECTIVES

13:15 - 14:00

Location: Conference Room B

Methane

Curbing methane emissions: a global imperative

One of the most effective ways to rapidly limit greenhouse gases is through methane abatement. This year, at least 40% of total methane in the atmosphere has been attributed to the energy sector. Mitigating emissions requires the enactment of regulatory policies such as those that will oblige operators to provide the highest standard of measurement, report and verification of emissions, carry out comprehensive surveys to detect and repair methane leaks, and cease all non-emergency flaring and venting practices. With the help of existing technologies and the collective compliance of major oil and gas producers, these regulations will enable the energy industry to effectively abate and create a new supply, and a stabilised market for captured methane.

Attendee insights

Understand the vital role of energy producers, operators and policymakers in methane abatement. Recognise the opportunities for technology companies to provide credible and workable solutions.

LEARN MORE ABOUT THE ADIPEC 2023 CONFERENCES

BOOK YOUR DELEGATE PASS

adipec.com/conferences

Tuesday 3 October 2023

STRATEGIC PANEL

10:00 – 11:00

Location: Decarbonisation Theatre

DAC and CCUS as enablers of carbon neutrality

Direct air capture (DAC) and carbon capture, utilisation and storage (CCUS) are prominent and important technological options to reduce carbon emissions and achieve net-zero ambitions. The source of carbon and technical functionality may differ between DAC and CCUS, but both technologies face the obstacle of being capital and energy intensive. To accelerate the deployment of these carbon capture technologies, governments must increase research and development funding, expand carbon offset procurement, and implement progressive regulations and subsidies that support the commercialisation and incentivisation of carbon capture.

Attendee insights

Understand the key importance of carbon capture technologies in facilitating a faster transition to a net-zero energy system and why organisations should advance these technologies.

LEADERSHIP PERSPECTIVES

11:00 – 11:45

Location: Decarbonisation Theatre

Decarbonising every drop: a net-zero road map for NOCs

While international oil companies (IOCs) are at the forefront of investing in low-carbon initiatives, there is growing pressure for national oil companies (NOCs) to advance at pace with their own decarbonisation journeys. NOCs represent a key opportunity for accelerating decarbonisation with their capacity to diversify energy portfolios, reduce related emissions, produce and promote low-carbon fuel, and advocate for climate policies. What can NOCs individually and collectively do to make an instrumental impact on the energy transition? Can greater collaboration with IOCs help catalyse sustainable funds and immediate solutions to manage the transition to a new age of energy?

Attendee insights

Gain insights on how NOC leaders are navigating the current energy system and understand the central role they play in building synergy to reach an inclusive and effective transition to a low-carbon economy.

STRATEGIC PANEL

11:45 – 12:45

Location: Decarbonisation Theatre

Carbon tax vs. subsidies: what is the best regulatory method to accelerate emissions reduction?

Carbon taxes and subsidies are two policy measures that can be used to accelerate emissions reduction. Some experts believe that subsidy policies are more effective than carbon tax policies since they incentivise the development of low-carbon technologies and industries. Others disagree since carbon tax is a market-based mechanism encouraging organisations to eliminate added operating costs, which leads to avoidance of emissions. As a drawback, carbon taxes can be regressive while subsidies can be expensive and may not be sustainable in the long term. In enacting these measures, policymakers must consider factors like policy design, level of tax or subsidy, the sectors covered, duration and the impact of the policy on different stakeholders, including consumers, producers, and the government.

Attendee insights

Understand the different implications of implementing carbon taxes and subsidies and how both can help achieve net-zero through the acceleration of carbon emissions.

LEADERSHIP INTERVIEW

12:45 - 13:15

Location: Decarbonisation Theatre

Hydrogen Fuel Cells

Decarbonising road transportation: can hydrogen fuel cell technology meet clean energy expectations?

Achieving decarbonisation in the road transportation sector through the application of hydrogen fuel cell technology shows great promise for its capacity to generate electricity while only producing heat and clean water as byproducts. Over the next few years, it is foreseen that there will be a surge in the number of hydrogen-powered vehicles, including fuel cell trucks, taking to the roads. However, some challenges like lower energy density relative to liquid fuels, high cost, and limited infrastructure for hydrogen refuelling must be addressed to increase the competitiveness of fuel cell vehicles.

Attendee insights

Gain insights on hydrogen fuel cell technology development and understand its opportunities and how it can be a vessel to support decarbonisation in road transport.

LEADERSHIP PERSPECTIVES

14:20 - 15:00

Location: Decarbonisation Theatre

Decarbonising steel production: is there a future for green steel?

Green steel production is a relatively new concept expected to play an important role in the transition to a low-carbon economy. Traditional steel fabrication typically involves burning fossil fuels resulting in significant carbon emissions. With the help of renewable energy sources and recycled materials, the production of green steel is seen as a promising solution to reduce the carbon footprint of the steel industry. However, an underdeveloped infrastructure along with the lack of affordable green energy supply and the high cost of technologies make for the biggest challenges in implementing measures to decarbonise steel production. Overcoming this will need broader strategies that include the adoption of low-carbon solutions, a shift to a circular economy, and established policies on green premiums and green financing that will open opportunities for public-private investment in clean technology.

Attendee insights

Gain insights on the development of green steel production and understand the opportunity it creates to decarbonise a heavy-industry sector.



Wednesday 4 October 2023

STRATEGIC PANEL

10:00 – 11:00

Location: Decarbonisation Theatre

Renewable energy: scaling solar and wind power

Renewable energy has seen its largest increase in global capacity, largely due to the growth of solar and wind power and the further decommissioning of fossil fuel power plants in several large economies. Despite this, barriers remain to fully integrating renewables into the energy mix including intermittency, storage, and grid integration issues. Scaling renewable energy requires significant investment in infrastructure, including transmission lines, energy storage facilities, and new grid technologies. Addressing these challenges will require a coordinated effort among policymakers, industry leaders, and other stakeholders in order to develop and implement innovative solutions to support renewable energy growth.

Attendee insights

Understand the impact of solar and wind power as renewable sources of energy in decarbonising the global energy system.

LEADERSHIP PERSPECTIVES

11:00 – 11:45

Location: Decarbonisation Theatre

Electrification

Strategic electrification: supporting decarbonisation across sectors

According to the International Energy Agency, electrification holds great potential for reducing final energy demand due to the higher efficiency of electric technologies compared with fossil fuel-based alternatives. The demand for electrification technologies is mainly driven by transport, building heating, and industrial sectors where markets for electric vehicles and heat pumps are on the rise. To carry this momentum forward, significant funding for innovation and more policies supporting electricity networks are required to decrease the cost of alternative technologies and encourage key sectors to adopt electrification as part of their value chain.

Attendee insights

Understand the technical potential for electrification and how it can serve as an anchor to the decarbonisation strategies of multiple industries.

STRATEGIC PANEL

11:45 – 12:45

Location: Decarbonisation Theatre

Powering nuclear energy to support a low-carbon energy system

Nuclear energy has shown steady growth over the years as some countries continue to pursue it as a viable option for their energy needs, despite its risks. Part of this growth can be attributed to its high-capacity factor, the capability to generate reliable and carbon-free power, and the recent developments in reactor technologies such as small modular reactors, advanced reactors, and high-temperature gas-cooled reactors. But a variety of barriers and risks exist, such as the management of radioactive nuclear waste, high costs, and public perception of nuclear energy. The successful deployment of nuclear energy relies on both the public and private sectors collaborating to develop the nuclear industry in a manner that mitigates risks, facilitates swift implementation, and fosters the growth of nuclear energy.

Attendee insights

Gain insights on the development of nuclear power as a key enabler of secure transitions to low-emissions energy systems.

LEADERSHIP INTERVIEW

12:45 - 13:15

Location: Decarbonisation Theatre

Unlocking battery storage technology as a catalyst of clean energy

Renewable energy production is crucial for global decarbonisation, but the development of energy storage systems is equally important to address the intermittent nature of solar and wind power. Today's leading technology of choice for battery energy storage systems is lithium-ion due to its cost-effectiveness and high efficiency, but long-duration energy storage is slowly gaining traction as an alternative to enable storage of large quantities of low-cost energy over long timescales. This is particularly important as the electricity sector moves towards 100% clean energy. As utility-scale battery costs and renewable energy prices decline, the utilisation of battery-based energy storage systems will increase, playing a larger role in the transition towards a decarbonised global economy.

Attendee insights

Gain insights on the essential function of battery storage technology as an enabler of clean energy and understand how it can help accelerate the decarbonisation of energy systems.



Thursday 5 October 2023

STRATEGIC PANEL

10:00 – 11:00

Location: Decarbonisation Theatre

Decarbonising aviation: is net-zero air travel achievable?

Decarbonising commercial aviation needs large-scale investments in the development of new technology and aircraft, including hybrid-electric aircraft, fuel-burn efficiency applications, contrail mitigation solutions and sustainable aviation fuel. But disadvantages such as the expensive and inadequate supply of biofuels, as well as the limited infrastructure to develop hybrid-electric aircraft could slow its progress. Governments, airlines, and the wider aviation industry must work together to accelerate the transition to a more sustainable aviation sector.

Attendee insights

Gain an understanding of the progress and obstacles in decarbonising the aviation industry as one of the hard-to-abate sectors.

LEADERSHIP PERSPECTIVES

11:00 – 11:45

Location: Decarbonisation Theatre

Circular Economy

Circular economy: boosting decarbonisation through circular solutions

Adopting a circular economy in the energy sector presents opportunities to develop a sustainable and low-carbon energy system by reducing dependence on fossil fuels and mining, supporting carbon recycling, and promoting the long-term use of renewable energy sources and the preservation of critical minerals. While the circular economy enables a promising vision for a more sustainable future, it also faces several challenges that must be addressed in order to realise its potential. Some of these barriers include the need to build circular economy principles into the design of the energy transition, a significant shift away from traditional linear approaches to economic activity, a lack of suitable technologies for recycling and repurposing materials and energy resources, the high cost of implementation and the lack of supportive policies and regulations that incentivise circular economy practices.

Attendee insights

Understand the value of circular economy as a decarbonisation strategy and how energy companies can adopt elements of circularity into their operations.

LEADERSHIP INTERVIEW

11:45 – 12:15

Location: Decarbonisation Theatre

Decarbonising cement production: can producers reach carbon neutrality by 2050?

According to the Global Cement and Concrete Association, cement production accounts for approximately 7% of global direct carbon emissions. Major producers are actively taking measures to reduce emissions by 2030. but decarbonising the cement industry, by 2050, will necessitate technological innovation, operational enhancements, the adoption of carbon capture technologies, reducing clinker content in cement, and promoting the use of alternative fuels. Additionally, challenges such as high emissions from the calcination process of cement production, along with the limited alternatives to cement substitution, will also have to be addressed to make progress in the decarbonisation efforts.

Attendee insights

Gain insights on the recent developments in the decarbonisation of the cement industry and understand its impact in achieving net-zero emissions by 2050.

LEADERSHIP PERSPECTIVES

12:15 – 13:00

Location: Decarbonisation Theatre

Energy Efficiency

Harnessing the potential of energy efficiency to lower emissions

Improving energy efficiency is a significant step towards decarbonising our energy systems. In addition to its potential in mitigating climate change by reducing emissions, it can also contribute to lowering energy expenses for consumers and enhancing competitiveness for businesses. Energy efficiency delivers several environmental benefits essential to decarbonisation strategies, but challenges such as volatile energy prices, limited access to financing and technical expertise, lack of awareness and education, and energy security concerns can hinder its progress for businesses and end-users alike.

Attendee insights

Understand the significant role of energy efficiency in today's energy systems and how it can massively contribute to achieving a net zero world.

SUPPORTERS

PIONEERING DEPLOYABLE
AND SCALABLE NET ZERO
SOLUTIONS

8 RIVERS



8 Rivers is a climate technology company based in Durham, North Carolina, that focuses on infrastructure-scale clean technology innovation and commercialization. As a global leader in carbon capture, we develop and deliver sustainable solutions to enable the world’s largest companies to meet their emissions reduction targets. We began in 2008 as a small team of visionaries, engineers, and entrepreneurs tempted by the prospect of solving the most difficult global challenges. After a period of eclectic inventing, our scope narrowed around a novel clean energy thesis: to meaningfully decarbonize, we must engage and develop solutions for the oil and gas industry. Shortly after, a small but mighty team of 8 Rivers founders and principals invented the Allam-Fetvedt Cycle (AFC), our solution to generating ultra-low emissions, base-load energy from carbon-based fuels.

We learn from our partners directly where they face challenges and set out to develop targeted solutions to meet those needs. We quickly determine if promising new decarbonization solutions will be affordable, scalable, and impactful enough to solve these major challenges.

The 8 Rivers innovation platform is driven by a techno-economic evaluation process that prioritizes balancing economics and science. By combining deep technical analysis with advanced financial modeling, our unique approach to innovation empowers us to tackle the world’s most meaningful decarbonization challenges, even in difficult and often overlooked markets.

To commercialize the AFC technology for natural gas, we founded NET Power (NYSE: NPWR) which recently went public, having raised gross proceeds of \$670 million. The 8 Rivers team continues to support the advancement of NET Power, including leading several commercial project deployments.

Since developing the AFC, 8 Rivers has become a world leader in carbon capture and oxy-combustion, holding more patents in CO2

Cross-sector Decarbonization

8 Rivers is a clean energy and climate technology company with a diversified portfolio of decarbonization-focused technologies. We aim to be the pre-eminent company in the energy transition, recognized for our innovation, aggregation, and deployment of net-zero solutions, estimating at least a billion tons of CO₂ reduction by 2035. 8 Rivers offers cross-sector decarbonization solutions and continues to innovate based on needs across the energy transition.

related to energy systems than any other entity globally. We believe that the energy transition is an enormous problem that requires an array of solutions. In that spirit, we have rapidly increased our technology portfolio to include industry-leading technologies in ultra-low-carbon hydrogen, sour gas to sweet gas conversion, and direct air capture.

Our first 8RH2 clean hydrogen project will produce nearly 1M tons of ultra-low carbon intensity ammonia per year. To accelerate direct air capture, we will be deploying the Carbon XPRIZE Award-winning Calcite DAC technology, first at the 50,000 tons carbon removal per year scale, and then scaling up to millions of tons per year.

These are two of the many projects we are actively developing to quickly bring our portfolio to market. As our ambitions have grown, so has our world-class team which is now spread around the globe. 8 Rivers has evolved over the past 15 years into a leading decarbonization solution provider - we are inventing, deploying, and scaling infrastructure-scale solutions for the thorniest decarbonization challenges.

As the momentum for climate technology grows, we have established a unique position for driving the energy transition forward. Notably, our partnership with the SK Group, which began with a \$100 million investment in 2022 and then grew in 2023, has propelled our rapid growth trajectory and positioned us to support a broader range of decarbonization efforts globally.

Looking ahead, 8 Rivers will be a major driving force in industrial decarbonization. With our diverse portfolio, in-depth industry knowledge, and strategic partnerships, we provide customers with economic and actionable pathways to decarbonize. By integrating markets and technologies through our solutions platform, we can successfully partner with the world’s largest emitters to take real steps toward decarbonization.

Innovation and collaboration across the full energy value chain is critical to accelerate decarbonization of industry and facilitate the transition to a low carbon society.

By Johan de Villiers, Regional Division President , ABB Energy Industries

Climate change is arguably the most pressing challenge facing humanity, and requires concerted global action from industry, government, and wider society. There is no silver bullet to the global warming crisis; instead, it requires a mix of innovative technologies, investment, and legislation.

In the UAE the government has put forward a clear vision and targets to achieve by 2030 which includes increasing the nation’s clean energy share by 30 percent and reducing emission from power consumption by 70 per cent by 2030, including drastically reducing emissions from the energy sector and energy intensive industries. These objectives are mirrored across the entire MENA region.

However, the energy transition is not going to happen overnight; it’s an evolution, not a revolution. At ABB Energy Industries our focus is on supporting a concept of ‘net additions, minimizing emissions.’ By that we mean finding ways we can add the required capacity and diversity to our global energy mix whilst at the same time building efficiencies to make existing hydrocarbon energy infrastructure as sustainable as possible. Success across both relies on continuous innovation to deliver both the existing and emerging technologies which are already helping to transform the global energy industry.

One example is Carbon Capture and Storage (CCS), which is increasingly being recognised as key to helping industry, especially hard-to-abate, reach their net zero targets. Decarbonizing industry overall is essential to achieving net-zero emissions by 2050. According to McKinsey & Company analysis uptake by industry needs to grow 120-fold by 2050, but if successful, CCS alone could be responsible for reducing carbon emissions generated by the industrial sector by 45 percent.

That’s why ABB has partnered with Pace CCS to make the capture, transportation, and storage of industrial carbon dioxide emissions more accessible, to drive scale. One of the biggest challenges to mainstream CCS adoption has been a lack of operational practice across the full value chain. Companies can see the benefits of CCS but are reluctant to make the investment without clear knowledge of how things will work on the ground.

So, together, ABB and Pace CCS have developed digital twin technology that simulates the design stage and tests scenarios to deliver proof of concept to ensure the design is fit for purpose to help customers make the integration of CCS into offshore operations more accessible and affordable, and less risky.

Another area we are actively involved in is supporting decarbonization of hard to abate industries such as chemicals, steel, and cement.

According to the International Energy Agency (IEA), chemicals, cement, and steel production collectively account for 70 percent of industrial CO₂ emissions, equal to approximately six billion tons annually and that the decarbonization of heavy industries is essential to achieving net-zero emissions by 2050.

Technology innovation is once again making progress in these fields. ABB has partnered with Finnish technology company Coolbrook to accelerate the development and scale of Coolbrook’s patented RotoDynamic technology which uses electrification powered by clean energy to drastically cut the CO₂ emissions in steam cracking, one of the world’s most carbon-intensive industrial processes, by up to 2.4 billion tons annually.



Coolbrook’s RotoDynamic Reactor replaces a conventional furnace by directly imparting the rotor shaft’s mechanical energy to the hydrocarbon fluid. This is achieved by aerodynamic action through a rotating blade flow. When powered by electricity from renewable sources rather than fossil fuels, the technology eliminates CO₂ emissions in the steam-cracking process.

Enhancing the solution, ABB is providing its automation, electrification and digitalization expertise, as well as integrating its electric motors and variable speed drives, to further enhance Coolbrook’s technology by optimizing energy efficiency and operational processes

The two partnerships, centred around collaboration and technology development for scale up, underpin ABB’s sustainability strategy and commitment to help customers reduce their annual CO₂ emissions by 100 megatons by 2030. To truly achieve these goals, and those of the energy transition we believe need to build an entire ecosystem. No one can do this alone, which is where collaborations such as with Pace CCS and Coolbrook, and many others, come into play.



Stand: A405
Hall: Atrium
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www.adportsgroup.com



In an era marked by the urgency for major global players to address decarbonisation, AD Ports Group, a global leader in trade, logistics, and industry exemplifies their unwavering commitment to pioneering innovative strategies that contribute to the global energy transition and a decarbonised future. The Group has placed sustainability at the core of its operations and recognises the importance of collective action, which is why all five vertically-integrated Clusters that encompass AD Ports Group are committed to meeting global sustainable development goals and aligning with the UAE's ambitious sustainability commitments.

At the forefront of AD Ports Group's efforts is the integration of sustainability and decarbonisation into their Green Ports developments. The Group's comprehensive decarbonisation roadmap comprises of a spectrum of initiatives, including energy efficiency measures, electrification, the transition to renewable energy, and the establishment of sustainable infrastructure. Moreover, through innovation, AD Ports Group has been exploring alternative energy sources such as hydrogen and methanol fuel systems for hybrid vessels, ensuring a transition towards greener fuels.

Collaboration plays a pivotal role in AD Ports Group's sustainability strategy. The Group is actively cooperating with key international partners to champion clean hydrogen energy handling and transport within ports. This approach extends to on-ground solutions, with proof of concepts in hydrogen-powered energy supply, net-zero desalination, sustainable logistics employing drone delivery, and even carbon capture for synthetic carbon-neutral fuel production. These initiatives are not merely conceptual but tangible steps towards a more sustainable future.

Through fostering a commitment to a circular economy, KEZAD Group, part of AD Ports Group's Economic Cities and Free Zones Cluster, sources materials within its ecosystem, to minimise waste and drive synergies among KEZAD Group's family of companies. This integration extends to a partnership with TotalEnergies to explore solar energy opportunities across KEZAD's industrial ecosystem, creating a positive impact while utilising sustainable solutions.

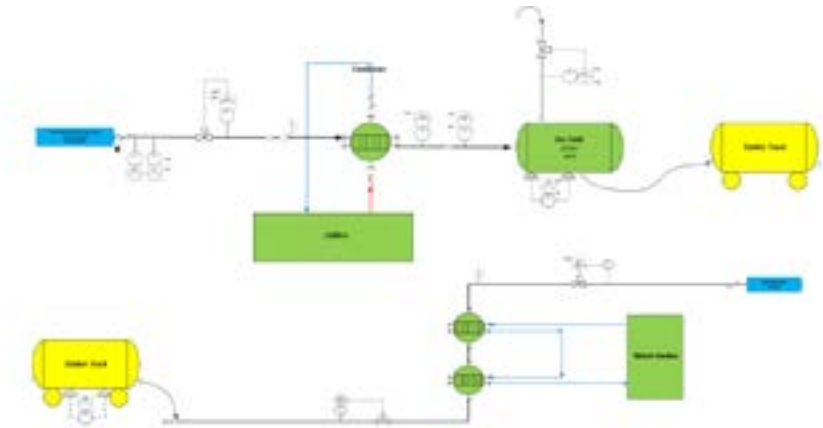
It is clear that AD Ports Group's influence spans beyond its own operations. The Group collaborates with clients and partners, fostering open communication and idea-sharing to drive sustainability across businesses. By engaging with a wide network, AD Ports Group magnifies its impact, catalysing change on a larger scale.

The Group's pursuit of sustainability extends to warehousing and transportation operations within the Logistics Cluster. Advanced insulation solutions and solar powered integration at KLP21, a prominent food logistics centre, reflect AD Ports Group's dedication to energy efficiency and emission reduction. Furthermore, the optimisation of the transport fleet through newer, more efficient models, and the exploration of electric vehicles, showcases the Group's commitment to reducing carbon emissions.

Through these initiatives and collaborations, AD Ports Group plays a crucial role in driving the global decarbonisation agenda and as the world tackles the challenges of a changing climate, AD Ports Group is a beacon of hope, showcasing the potential for sustainable business practices to shape a more environmentally friendly future.



Stand: 12434
Hall:12
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www.aggreko.com



Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions.

Blue Ammonia is a low-carbon approach to ammonia production which combines traditional ammonia synthesis using natural gas with carbon capture and storage (CCS). The scope of the technology deployed is to capture the CO2 generated at the SMR as reaction by-product to allow its permanent storage and reduce the carbon footprint of each ton of Ammonia produced. It is a new potential source of energy used to produce electricity low carbon emissions. Application can grow beyond current applications and support energy transition towards low-carbon fuels.

How does your decarbonisation-related product, process or solution benefit the industry or users?

Objective of the application is to:

- Achieve sustainable goals of low-carbon emission
- Protect environment from GHG (Green House Gas) emissions

Aggreko engineered a temporary solution consisting of a Condensation skid and Injector and successfully implemented in a project where it helped to store 1,500 tons of CO2. The Customer hired the Engineered Temporary Solutions on a limited time period, minimizing the Capital Investments to the pipework necessary to connect the temporary skids to the existing installations. In doing so, the Technological and Financial risks have also been minimized, the Customer retained the privilege to increase the hiring time as long as its Economic Benefits remained strong vs. Rental Costs. As Customer scope also included the certification of the overall Sequestration and Storage chain, Aggreko supplied a temporary system to capture key data. This allowed the Customer to certify an equivalent amount of Ammonia as "Blue" which is sold at a premium price.

Please provide any examples of how your decarbonization-related product, process or solution has been used in the field and what sort of impact it has or can have.

As part of Fertiglobe and ADNOC strategy to explore opportunities in hydrogen and hydrogen carrier fuels such as Blue Ammonia, with the ambition to position the UAE as leader for low-carbon hydrogen, the initiative was taken by Fertil in 2021 to install a prototype CO2 liquefaction unit at the already existing Fertil-1 plant. The liquefied CO2 was then transported to one of the compression facility in Al-Reyadah, Abu Dhabi owned by ADNOC onshore, where it was evaporated and injected into the compressor suction. The project was successfully commissioned in August 2021 and 1,000MT of Blue Ammonia was secured by end of March 2022. CO2 liquefaction unit includes VLTs (very low temperature chillers), Heat exchanger, circulation pumps and other piping and power accessories were taken on rental basis including operation and maintenance services provided by Aggreko. The project has in turn reflected the reduction of GHG emission by 1,500MT of CO2 to the atmosphere. The facility involved the transportation of 50 tons per day of liquid CO2 from Ruwais to Abu Dhabi.

How will you be promoting your decarbonisation efforts at ADIPEC 2023?

We are exhibiting at ADIPEC with an exhibition stand where we have spokesperson explaining the solution.



Stand: 5354
Hall: 5

www.aws.amazon.com



Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions

With today’s energy industry rapidly changing, the need for energy companies to innovate is critical. As customer behaviors evolve, energy demand increases, and the need to decarbonize accelerates, energy organizations will need to increase innovation through the latest cloud technologies such as AI, ML, edge computing, and many others. Those cloud technologies, along with many others, form the foundation of energy solutions such as Renewables Data Lake, Carbon Data Lake and Emissions Monitoring Systems that are helping the industry accelerate the energy transition. The Emissions Monitoring Systems solution provides a centralized, accurate, and continuous view of measured emissions alongside operational data. This allows facility engineers, operations GMs, and environmental teams to see measured emissions so they can quickly act (maintain, operate, design), driving down per-unit-volume carbon intensity (kgCO2e/bbl), reducing equipment failures and safety incidents, retaining product volume, and curtailing environmental impacts. The Renewables Data Lake & Analytics is a cloud native solution that offers customers IoT data ingestion pipeline, data lake and advanced analytics for their renewable energy assets. This solution allows customers to monitor and optimize their renewable generation fleets at a relatively low cost, and at scale. This solution can serve as a foundation for renewable project lifecycle optimization. Carbon Data Lake is a solution that allows customer to take data from their operations across disparate sources, such as distributed energy assets, and consolidate it in a more simplified manner. This solution provides customers and partners with the foundational infrastructure that can be extended to support use cases including monitoring, tracking, reporting, and impact verification of greenhouse gas emissions. Beyond solutions, AWS offers the

Clean Energy Accelerator program a high-pace, non-equity dilutive accelerator designed to facilitate partnerships with leading energy organizations and mature startups developing breakthrough clean energy technologies. CEA aims to solve the innovation gap that exists today as the world navigates the energy transition.

How does your decarbonisation-related product, process or solution benefit the industry or users?

The Emissions Monitoring Systems solution provides a centralized, accurate, and continuous view of measured emissions alongside operational data. This allows facility engineers, operations GMs, and environmental teams to see measured emissions so they can quickly act (maintain, operate, design), driving down per-unit-volume carbon intensity (kgCO2e/bbl), reducing equipment failures and safety incidents, retaining product volume, and curtailing environmental impacts. The Renewables Data Lake & Analytics is a cloud native solution that offers customers IoT data ingestion pipeline, data lake and advanced analytics for their renewable energy assets. This solution allows customers to monitor and optimize their renewable generation fleets at a relatively low cost, and at scale. This solution can serve as a foundation for renewable project lifecycle optimization. Carbon Data Lake is a solution that allows customer to take data from their operations across disparate sources, such as distributed energy assets, and consolidate it in a more simplified manner. This solution provides customers and partners with the foundational infrastructure that can be extended to support use cases including monitoring, tracking, reporting, and impact

verification of greenhouse gas emissions. The Clean Energy Accelerator program is a high-pace, non-equity dilutive accelerator designed to facilitate partnerships with leading energy organizations and mature startups developing breakthrough clean energy technologies. CEA aims to solve the innovation gap that exists today by partnering with clean energy and climate tech startups to accelerate their commercial viability.

Please provide any examples of how your decarbonisation-related product, process or solution has been used in the field and what sort of impact it has or can have.

Greenko is one of the largest operators of renewable assets in India with an installed capacity of 7.5 GW. Originally completely on premises, Greenko was struggling to derive value from data trapped in historians, rising IT infrastructure costs and delays in onboarding of new renewable sites. With the Renewables Data Lake & Analytics Solution, Greenko developed a scalable, cost efficient and secure IoT data ingestion and analytics platform, which eliminated data silos allowed them to get real time insights into the health of their wind turbines, spread across 15 states of India. Since the inception of the Clean Energy Accelerator in May of 2021, more than 1,100 startups from across 64 countries have applied to the program. All energy companies who participated as the startups’ piloting partners in 2022 have returned to the new edition- plus a few more, with the likes of Enel, Iberdrola, EDF, Siemens Energy and others. The program includes international

support from VCs and industry bodies such as, the Climate Pledge Fund, EIT Climate-KIC, ETF Partners, Blackrock Decarbonization Partners, Eurelectric, Lisbon Municipality, Wind Europe, and others. We’ve started to see some encouraging results. To date, the program has helped over 14 pilot kickoffs (and growing), influenced more than \$207 million in seed funding for clean energy and climate technology startups and across the board accelerated their growth trajectories.

How will you be promoting your decarbonisation efforts at ADIPEC 2023?

AWS leaders and executives will be presenting on these solutions throughout their conference sessions.

THE STRATEGIC ROLE OF DIGITALIZATION IN ACHIEVING DECARBONIZATION TODAY

Ron Beck, Aspen Technology Inc, October 2023

Pundits, geopolitical analysts, and strategists tie together decarbonization and digitalization in the same breath. There is a reason. The past, piecemeal approaches to design and project execution will not meet the world's 2030 and 2050 decarbonization objectives. Fortunately for asset operators, the AspenTech asset optimization solutions are ready today to achieve energy efficiency and carbon avoidance across the energy and chemicals value chain, and innovate digitally faster and better than ever before.

Here is a quick tour of how digital is helping asset operators decarbonize:

Energy efficiency. Whether a polished, shiny-new mega-asset or an aging production facility, energy efficiency is a crucial decarbonization opportunity. AspenTech offers a complete energy optimization solutions basket that digitally reduces energy use 10-20%. This includes adaptive process control (Aspen DMC3), online digital twins, comprising first-principles models supercharged by hybrid models incorporating AI for energy intensive units (Aspen HYSYS), next-generation site and multisite planning, to optimize feedstock selections minimizing carbon intensity, and supply chain planning to minimize energy use in products transportation outbound. Together these digital strategies optimize energy use on the demand side.

Electrification and Utilities Optimization. Renewable energy is a significant decarbonization strategy for energy-intensive assets. To optimize the deployment of renewable energy, industrial microgrid solutions (using Aspen OSI DERMS) will improve and optimize utilization of renewable sources by 5-10% and sitewide and multi-site utilities modeling, online and offline (Aspen Utilities Planner) will constantly provide decision support to make the utilities choices that balance decarbonization and OPEX, reduce water use by processes and steam utilities, and track renewables to monetize green credits. These optimize the energy supply side.

Strategic planning. A dizzying array of alternatives for carbon capture, carbon utilization, hydrogen production, and bio-feedstock integration are available for upstream, downstream and chemicals applications. Where this makes most economic, decarbonization, and strategic sense is a crucial, and decisions must usually be made, regarding new technologies, with little detailed engineering or performance information available. Strategic planners are challenged to make decisions that minimize risk but maximize future value. A comprehensive set of digital solutions can provide decision support in this context. Last ADIPEC, AspenTech and ARAMCO announced a strategic partnership to bring ARAMCO ideas and intellectual property into software to be commercialized by AspenTech. A progress report will be made during the ADIPEC technical conference sessions. Systems-level, probability-based models (using Aspen Fidelis) are helping project sponsors sort through the dizzying array of options for designing the desired hydrogen systems; ensuring investor confidence and certainty, that has been used by an AspenTech energy customer in the global south and another in South Asia to perform feasibility analysis for large-scale hydrogen production system. As a proof of concept for country-wide planning, AspenTech has employed Multi-site planning (Using Aspen Unified PIMS) to design hydrogen economy end-to-end solutions for the State of California and for New England, in the US.

Permitting of carbon and hydrogen storage. Companies face CCS and DAC permitting. Regulators want confidence regarding subsurface carbon storage and monitoring over long term. The same subsurface modeling that help the oil and gas industry optimize their oil and gas production, helps characterize target depleted reservoirs and saline aquifers for CO2 sequestration (AspenTech SSE Suite). Here, AI is also a key solution element in predicting the most certain subsurface target zones. The net result is an acceleration of the permit process, and assuring companies buying carbon offsets that sequestered carbon is being securely stored in place.



Speed and Scale for CCUS, DAC and hydrogen. The industrywide challenge is the speed with which carbon capture and hydrogen projects must proceed. (See the accompanying figure.) The only way to accomplish this is via automated engineering workflows to achieve design and project certainty, through repeatable and accelerated project designs. ENI Progetti has fully captured their CO2 capture technology in an automated FEED system (Aspen Basic Engineering). This enables front end execution of CO2 capture projects 30 to 90% faster. Industry will need to adopt such “born digital” approaches to project execution to meet company and industry-wide goals for net zero. Today’s approach to project-by-project engineering simply is an approach that will not meet the requirement.

LEVERAGING TECHNOLOGY TO ACCELERATE THE PATH TO NET-ZERO

Baker is an energy technology company providing solutions to energy and industrial customers worldwide.. Its mission to take energy forward - making it safer, cleaner, and more efficient for people and the planet.

We are reducing the carbon intensity of our operations, applying proven low-carbon technology to help our customers meet their environmental goals, and innovating for the future of energy.

We understand that the energy transition is here, with its trilemma of sustainability, affordability, and security. Accordingly, we must accelerate deployment or current technology and development of future technology to meet Paris Agreement goals. While technologies in use today can deliver significant emission reductions, they are insufficient on their own to meet the Paris Agreement goals. We need a dual approach to implement efficiency measures today and invest in new energy solutions for the future.

We also believe that since reliance on hydrocarbons will not disappear, there for efficiency and lowering emissions matter. For at least the next 30 years, oil and gas will continue to play an important part in meeting global energy demand – even in the most aggressive of energy transition scenarios. And we are working on solutions to reduce emissions.

Partnerships are key; there is no path to net-zero without collaboration, integrated thinking, and common sustainability standards. It will take energy producers, technology and service providers, energy buyers, policymakers, and the community at large to work closely together to achieve our collective ambitions. Today, we know this matters more than ever.

We take a dual approach to a sustainable energy future. First, we are deploying the most efficient and least emissive technologies to make progress on the path to net-zero today. These technologies and solutions include clean power, efficient oilfield, emissions abatement and intelligent asset management and optimization.

Second, we are investing in sustainable energy technology for tomorrow. By accelerating the adoption and deployment of new fuel sources and emission solutions, we can decarbonize energy for tomorrow. We continue to develop technology solutions to help our customers produce cleaner and more efficient energy to meet the world’s growing demand. These solutions include: Hydrogen: we provide advanced technologies to accelerate hydrogen deployment as an alternative source of energy. The opportunity to use hydrogen as a zero-emissions fuel source has significant growth potential. For example, we are active in generation, where we have reconfigured our NovalT™ turbines so they can run on up to 100% hydrogen. In addition to generation, our compression technology has applications in hydrogen production, storage, liquefaction, and transportation.

Geothermal: We believe the geothermal industry will play an increasingly significant role in global energy mix on the shared journey to net-zero carbon emissions by 2050. Baker Hughes has been active in geothermal hotspots for more than 40 years with projects in more than 20 countries across five continents.

Carbon Capture Utilization and Storage (CCUS): is a critical solution to help meet the Paris Climate Agreement goals and to achieve decarbonization of the oil and gas sector. We have exposure in several areas within the CCUS value chain. These include post-combustion capture, compression, subsurface storage, and long-term integrity and monitoring.

Energy storage: As renewable energy continues to grow; energy storage will play an increasingly significant role in energy systems. Our initial focus is on liquid air storage and compressed air storage, which leverage our core turbomachinery technology.




As an energy technology company, Baker Hughes offers truly differentiated technology at scale across a variety of energy sources—from oil and gas to alternative and renewable energy. The scope and scale of our portfolio gives us a unique advantage to bring the most complete suite of low-carbon solutions to energy and other industrial markets. This is a capability our customers require and look for to reduce the carbon intensity of their operations, particularly on major projects. We also continue to innovate on new low-carbon products and services to help our customers reduce their emissions from oil and gas operations as well as to support the future energy mix that includes a range of alternative and renewable energy sources.


CHEVRON BOOTH SPEAKERS

subject to change

Booth Area	Start	End	Speaker	Title	Subject
Monday, October 2	10:00 AM	1:00 PM	Open Showcase: Technologies & Portfolio Companies		
	1:15 PM	1:45 PM	Luis Alcoser	Future Energy Fund General Manager	Investing in Future Energy Startups
	2:00 PM	2:30 PM	Silixa, Ionomr	Special Session with Portfolio Companies	<p>Special Session with companies in the industry highlighting their lower carbon technologies and innovation within the industry.</p> <p>Silixa develops sensing systems for energy and security using acoustic and temperature sensors.</p> <p>Ionomr specializes in ion-exchange membranes and hydrogen production, fuel cells and electrochemical applications</p>
	2:45 PM	3:30 PM	Ingu, Hydrogenius, RayGen	Special Session with Portfolio Companies	<p>Special Session with companies in the industry highlighting their lower carbon technologies and innovation within the industry.</p> <p>Ingu makes mini mobile sensors that detect leaks, geometric defects, magnetic anomalies and deposits in pipelines.</p> <p>Hydrogenious is a developer of liquid organic hydrogen carrier technology</p> <p>Raygen is developing PV Ultra and Thermal Hydro ETC technologies that could improve long-duration energy storage and grid stability</p>
	3:45 PM	4:30 PM	Katie Pelliccio	General Manager of Technology Strategy and Performance	Chevron technologies and strategy
	4:45 PM	5:30 PM	Cesar Taba	Carbon Reduction Manager	Lower Carbon through Marginal Abatement Cost Curves (MACC)
	Start	End	Speaker	Title	Subject
Tuesday, October 3	10:15 AM	11:00 AM	Katie Pelliccio	General Manager of Technology Strategy and Performance	Technologies and Strategy Unlocking the Future of Energy
	11:15 AM	12:00 PM	Cesar Taba	Carbon Reduction Manager	Lower Carbon through Marginal Abatement Cost Curves (MACC)
	12:00 PM	1:00 PM	LUNCH / Open Showcase: Technologies & Portfolio Companies		
	1:15 PM	1:45 PM	Luis Alcoser	Future Energy Fund General Manager	Investing in Future Energy Startups
	2:00 PM	2:45 PM	Marisa Hamsik	General Manager, Strategy & Market Insights – Offsets & Emerging Technology, Chevron New Energies	Chevron New Energies Delivering Lower Carbon Solutions
			KC Littlefield	General Manager of Technology Commercialization in CCUS, Chevron New Energies	
	2:45 PM	3:30 PM	Carbon Clean and Svante	Special Session with Portfolio Companies	<p>Carbon Clean specializes in cost-effective industrial carbon capture</p> <p>Svante specializes in solid sorbent-based carbon capture and removal technology</p>
	3:30 PM	5:30 PM	Open Showcase: Technologies & Portfolio Companies		

* Confirmed speaker's attendance time subject to change





Stand: 14250
Hall: 14
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	Start	End	Speaker	Title	Subject
Wednesday, October 4	10:30 AM	11:00 AM	Luis Alcoser	Future Energy Fund General Manager	Investing in Future Energy Startups
					Special Session with companies in the industry highlighting their lower carbon technologies and innovation within the industry.
	11:15 AM	11:45 PM	Silixa, Ionomr	Special Session with Portfolio Companies	Silixa develops sensing systems for energy and security using acoustic and temperature sensors. Ionomr specializes in ion-exchange membranes and hydrogen production, fuel cells and electrochemical applications
	12:00AM	1:00PM	LUNCH / Open Showcase: Technologies & Portfolio Companies		
	1:00 PM	1:45 PM	Ingu, Hydrogenius	Special Session with Portfolio Companies	Special Session with companies in the industry highlighting their lower carbon technologies and innovation within the industry. Ingu makes mini mobile sensors that detect leaks, geometric defects, magnetic anomalies and deposits in pipelines. Hydrogenious is a developer of liquid organic hydrogen carrier technology RayGen is developing PV Ultra and Thermal Hydro ETC technologies that could improve long-duration energy storage and grid stability
	2:00 PM	2:45 PM	Marisa Hamsik	General Manager, Strategy & Market Insights – Offsets & Emerging Technology, Chevron New Energies	Chevron New Energies Delivering Lower Carbon Solutions
			KC Littlefield	General Manager of Technology Commercialization in CCUS, Chevron New Energies	
	3:00 PM	3:45 PM	Carbon Clean and Svante	Special Session with Portfolio Companies	Carbon Clean specializes in cost-effective industrial carbon capture Svante specializes in solid sorbent-based carbon capture and removal technology
	4:00 PM	4:45 PM	Katie Pelliccio	General Manager of Technology Strategy and Performance	Technologies and Strategy Unlocking the Future of Energy
	4:45 PM	5:30 PM	Open Showcase: Technologies & Portfolio Companies		
	Start	End	Speaker	Title	Subject
Thursday, October 5	10:30 AM	11:15 AM	Katie Pelliccio	General Manager of Technology Strategy and Performance	Technologies and Strategy Unlocking the Future of Energy
	11:30 AM	12:15 AM	Marisa Hamsik	General Manager, Strategy & Market Insights – Offsets & Emerging Technology, Chevron New Energies	Chevron New Energies Delivering Lower Carbon Solutions
			KC Littlefield	General Manager of Technology Commercialization in CCUS, Chevron New Energies	
	12:15 PM	1:00 PM	LUNCH / Open Showcase: Technologies & Portfolio Companies		
	1:15 PM	2:00 PM	Luis Alcoser	Future Energy Fund General Manager	Investing in Future Energy Startups
	2:00 PM	5:00 PM	Open Showcase: Technologies & Portfolio Companies		



For over 110 years, Elliott and Ebara have been synonymous with innovative engineering, highly reliable products, and unwavering commitment to customer satisfaction.

Elliott Ebara's global engineering and manufacturing produce efficient and reliable rotating equipment, including centrifugal and axial compressors, centrifugal pumps, steam turbines, and power recovery expanders for traditional energy markets such as oil & gas, to emerging new energy markets such as CCUS (Carbon Capture, Utilization and Storage), hydrogen & ammonia, and very high pressure and temperatures or ultra-low cryogenic applications. Our global network of full-service repair centers, field service teams, and sales and support offices extend throughout North and South America, Europe, the Middle East, and Asia.

As we look around us today, it is clear that we live in a world that is changing fast. Climate change, sustainability, ESG, and energy transition have become everyday phrases.

Our focus on the energy transition lies in the development and deployment of new and emerging advanced technologies that will provide pathways for us to look ahead, and also go beyond expectations to provide solutions to environmental and energy issues.

Our vision is to be the best solution provider in the energy sector by providing premier equipment and services, while actively leading sustainability efforts worldwide. Sustainability goals for 2030 declared by Ebara Corporation are to reduce GHG emissions by 55% as compared to 2018 as Scope 1 & 2, by 100 million tons in terms of CO2 conversion as Scope 3, and we target to achieve carbon neutrality by 2050.

We are excited to be at ADIPEC 2023 as a key exhibitor and participant. We are here to learn and understand the new, changing world of sustainable energy transition, showcase our existing and new technologies, and engage with our stakeholders, with our prime focus on customer-centric solutions for the energy transition as follows.

-Hydrogen: Ebara, along with Elliott, has a wide variety of businesses and technologies spanning the entire hydrogen value chain. When it comes to hydrogen production, we employ chemical recycling technologies that can convert waste into versatile gases, including hydrogen. Additionally, we are actively developing turquoise hydrogen production technology, which enables the generation of hydrogen from methane without producing carbon dioxide. We also specialize in various fluid machinery technologies for hydrogen transportation. This includes centrifugal compressors and Flex-Op™ Configurable Compressor solutions for transporting gaseous hydrogen, as well as cryogenic centrifugal pumps for liquefied hydrogen. Furthermore, we offer solutions for hydrogen utilization, such as high-pressure cryogenic plunger pumps designed for handling liquefied hydrogen in refueling stations and hydrogen-fired absorption chiller-heater systems.

-Ammonia: Currently, Elliott and Ebara have an extensive track record of delivering cryogenic centrifugal pumps for handling liquid ammonia. We are now expanding our technology and business to meet the growing demand for large-scale ammonia use as a clean fuel and hydrogen carrier. One of our notable technical features is a leakage-free submersible structure achieved through magnetic coupling or canned motor technology. This innovation contributes to environmentally friendly solutions for ammonia transportation and storage.

-Carbon Capture, Utilization and Storage (CCUS): We offer a diverse range of fluid machinery suitable for handling carbon dioxide in various fluid conditions. For example, we provide compressors for boosting and recompressing gaseous CO2 in pipeline applications, as well as pumps for injecting and transferring liquid or supercritical CO2. What sets Ebara apart is our unique ability to provide both compressors and pumps for CO2 applications. This enables us to offer a CO2 Phase Hybrid Compressor Pump Solution, optimizing both capital expenditure and operating expenditure based on our reliable compressor and pump technology.

Stand: 12340
Hall: 12

www.elliott-turbo.com



-Natural Gas: Natural gas is abundant, cost-effective, and recognized as the cleanest-burning fossil fuel. Compressors play a vital role in the natural gas pipeline network. Our pipeline compressors, designed by Elliott, are gearless, low-emission motor-driven units for long-distance gas transportation

Please visit our booth to discuss how we can join together to create a sustainable and better world for our future generations.

EMDAD'S JOURNEY IN SUSTAINABILITY & DECARBONISATION

With the forward thinking and continued support of our visionary leaders UAE secured a prominent position as the regional and Global Catalyst of Environment and Climate action.

ESG and Sustainability were always key components of our business strategy. EMDAD was a forerunner in decarbonization, with our thrust in renewable energy and carbon capture.

In the early 90s, EMDAD partnered with advanced engineering technology providers Enerflex, Canada and Hitachi, Japan, in offering sustainable technologies in acid gas removal, re-injection and storage. Enerflex offers a range of sustainable solutions with their Electrolyzers for Green Hydrogen and their Gas Treatment, Separation for Blue Hydrogen together Carbon Capture and Storage on EPC basis.

Long term Carbon storage in subsurface is a very complex task. It could spoil ground water resources if the well integrity is compromised. Emdad together with Welltec offer well integrity solutions with corrosion resistant annulus barrier designed for CO2 applications, thus protecting against leakage. Welltec Flow Valve technology helps CO2 to be distributed into multiple reservoirs and control back production for future Power to X solutions, that could use excess power to produce valuable products with CO2.

Fugitive emission of CO2 storage wells and the leakage of Methane in abandoned wells are a major source of GHG emissions that are often unaccounted for. EMDAD partnered with Hiber to offer most advanced satellite based digital continuous remote monitoring solutions for these remote un-monitored wells, thus reducing the GHG emissions into the atmosphere.

For over 25 years, EMDAD together with its partner ERM has been supporting the Country with Consultancy services in Environment Impact Assessment, Low Carbon Economy Transition, ESG/Carbon Performance Improvements and Transition and Biodiversity protection.

As ADNOC was looking for reliable solar system that could operate in unmanned desert locations, EMDAD partnered with reputed Solar system manufacturer Phaesun, Germany in 2005. In over 15 years, we have supplied more than 2,500 solar systems of various capacities, with oil field specifications, to highly critical applications.

In the process, EMDAD acquired the technology for Solar system design and manufacturing and have localized the production with the support of our technology partners. We now have full-fledged Renewables business line as EMDAD Energy, that could offer Solar, Wind and Hybrid solutions and could execute a project on EPC basis.

Geothermal energy offers unique advantages to the Renewable Power Grids of the future. It provides a reliable and abundant source of renewable energy all year around, which can be utilized in multiple ways.

With our technology partners TNO, we are executing studies in producing Geothermal Energy around the oil field locations. Hydrovolve hammer technology helps the drill bits while reaching greater depths in hard volcanic rock formations. The hammer action enables huge Rate of Penetration in hard rocks while reducing wear on the drill bits.

Welltec Enhanced Geothermal Systems for greater utilization of thermal energy reducing the heat loss in the process. Welltec Annulus Barriers can withstand very high temperatures and pressures of the Geothermal applications while resisting high acidic corrosion while our partner Wellboss offers Multistage completion technology for controlled fracking in deep wells. While reaching depths above 10,000 ft the Super critical fluid temperatures damage the downhole tools due to overheating. Coretrax has developed DAV Mx circulation sub technology that could withstand the temperature while allowing fluid flow of drilling fluids to reduce downhole temperature and high



Stand: 2430, 3130
Hall: 2

www.emdad.ae



drilling efficiency. In support of UAE's commitment to phase-out Ozone depleting Greenhouse Gases and Adnoc environment goals, EMDAD is successfully executing a major Halon Removal Project for ADNOC's offshore sites. The Project removes Halons and replaces them with environment friendly Novec in the gas-based Fire Extinguishing systems.

As a major initiative, EMDAD signed an MOU with an innovative technology provider to convert Hydrocarbons into Green hydrogen and Graphene thus eliminating the need for Carbon capture and storage.

Graphene is a disruptive technology; one that could open up new markets and even replace existing technologies or materials. It has wide ranging applications such as Semiconductors, Energy Storage, Membranes, Biomedical, Composites, Ultra-sensitive sensors etc. We are confident that the technology will help in value addition without pollution and open new opportunities for the Country, while supporting the Sustainability Goals and ADNOC's 2045 vision.



Stand: A300
Hall: Atrium
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www.eni.com

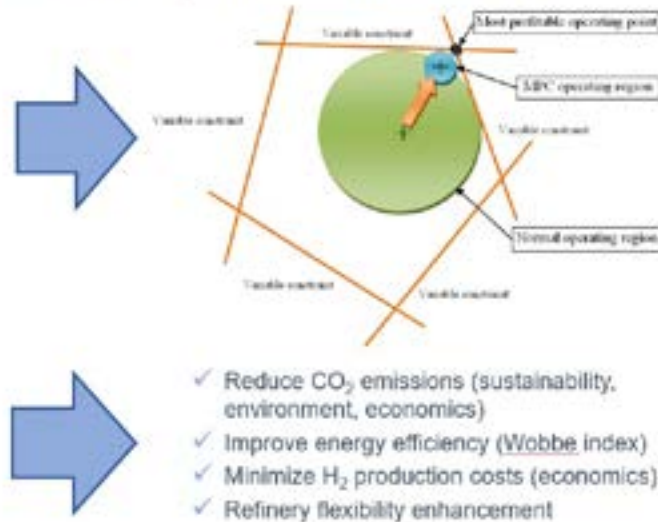
High Conversion Refinery H₂ Network Optimization Via MPC

The approach

- Multivariable Predictive Control (MPC) system to control & optimize refinery H₂ network
- Scope of work limited to a strategic section that can deeply impact over the entire H₂ network
- Low project cost
- Short time to deliver

Why optimize? Targets

- Minimize H₂ losses to fuel gas
- Minimize H₂ bleeds
- Minimize H₂ unbalance between producers and consumers
- Stabilize pure H₂ network pressures



Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions.

Eni Sannazzaro de' Burgondi refinery, a high conversion and complex site, has looked at an automated system to improve its hydrogen network and, without third party support and based on in-house expertise, has implemented an advanced process control application, specifically a Multivariable Predictive Control, that allows to minimize the hydrogen unbalance between producers and consumers, thus minimizing the associated hydrogen losses to blowdown grid and to the fuel gas network, consequently reducing hydrogen production costs and relative CO₂ emissions, stabilizing hydrogen grids pressures, therefore increasing site sustainability, flexibility and energy efficiency

How does your decarbonisation-related product, process or solution benefit the industry or users?

The momentum behind hydrogen as strategic vector to satisfy refining sector needs remains strong over the years. Nowadays, the hydrogen production typically involves high energy and carbon demanding processes. Consequently, hydrogen production significantly impacts on a refinery carbon footprint, on its energy efficiency and on the overall site sustainability. Therefore, any opportunity or solution aimed at optimizing hydrogen production and consumption is a positive and valuable action to pursue from environmental, sustainability, energy efficiency and economic standpoints.

Please provide any examples of how your decarbonization-related product, process or solution has been used in the field and what sort of impact it has or can have.

The overall project demonstrates how the implementation of a Multivariable Predictive Control system interestingly contributes to reduce a high conversion refinery carbon footprint and its hydrogen production cost via a fast-track and a low-cost initiative, being the site characterized by a complex hydrogen network with multiple hydrogen grids and steam reforming units to modulate the hydrogen production.

SEIZING THE OPPORTUNITY TO MEET THE WORLD'S EVOLVING NEEDS AND REDUCE EMISSIONS

Over a century of sustained global economic growth has resulted in the world's current levels of greenhouse gas emissions.

Getting the planet on a path to net zero will require unprecedented innovation and collaboration among governments, companies, universities, and others. To achieve sustained global emissions reductions, we'll need a thoughtful and comprehensive approach. It must balance benefits and costs, be sensitive to people's needs, and avoid economic hardships, market disruptions, and energy and product shortages.

When considering the skills and capabilities required to achieve this, there's no question that the energy industry has a critical role to play – one much bigger than most people realize.

ExxonMobil is doing our part.

Since 2016, we've made significant progress, reducing our Scope 1 and 2 operated emissions at a far faster rate than society as a whole. And we're committed to do even more, with further reductions built into our future operating plans.

As we've delivered on our past commitments, and work to achieve our plan objectives, we see the opportunity to help other essential industries and customers achieve their goals to lower emissions.

"Opportunity" is the operative word. That's partly why we established our Low Carbon Solutions business.

Since the world's climate challenge is immense, the opportunity it creates is equally immense.

We're working to establish a competitively advantaged foundation that secures a leading position in this new market. Our focus is on the global economy's hard-to-decarbonize sectors – think heavy industry, power generation, and commercial transportation. These are areas where cost-effective solutions are lacking, where we can make a unique and significant contribution, and where we can provide a vision for how society can succeed. The same competitive advantages that have underpinned the success of our traditional businesses for more than a hundred years will serve as the foundation for building a world-class, competitively advantaged Low Carbon Solutions business.

We know the challenge is enormous.

To tackle it, the world needs large, world-scale solutions.

We need them deployed globally, and at much lower costs than today.

The world needs to establish a new industry – a carbon-reduction industry – with new value chains and products.

These needs play to ExxonMobil's strengths.

Over our entire history and across the globe, we have built industries where none previously existed.

We see this even today with our developments in Papua New Guinea, Guyana, and Mozambique.

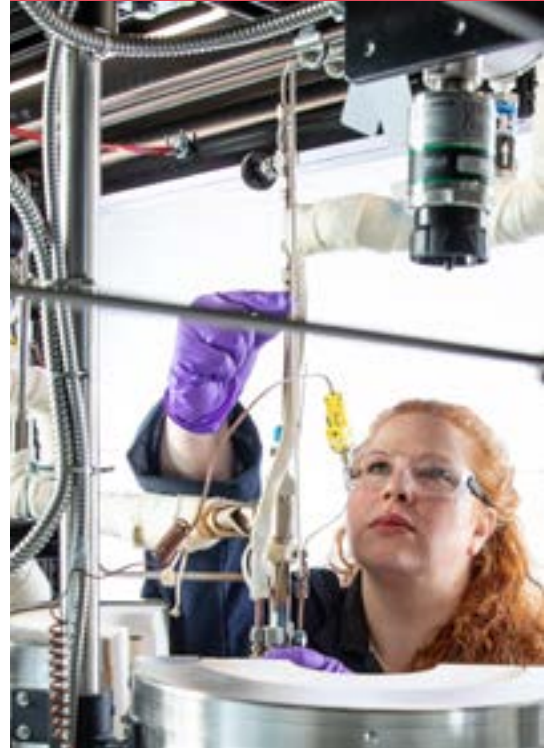
In the United States, meanwhile, we've established new, end-to-end, global value chains, connecting production in the Permian Basin of New Mexico and West Texas with manufacturing assets on the U.S. Gulf Coast, and with chemical, fuels, and LNG customers in the United States, South America, Africa, Europe, and Asia.

At our core, we're a technology company that manages and transforms molecules at scale, bringing value-added solutions to our partners and customers. We do this in a variety of ways, from modeling the subsurface and maximizing resource recovery to producing unique, high-value products,



Stand: A142
Hall: Atrium
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www.corporate.exxonmobil.com



all supported by safe, reliable, and efficient logistics and manufacturing prowess and top-tier science and engineering.

Of course, all our past successes and current strengths stem from the commitment, experience, and capabilities of our people. Their skills, tenacity and resiliency are the bedrock on which our company is built.

ExxonMobil's Low Carbon Solutions business leverages these, giving us the ability to invest in the largest and highest-return, low-carbon opportunities anywhere in the world.

We're an organization that works to meet our commitments, deliver capital-efficient projects on time, and achieve the highest standards for safe and reliable operations. It's what makes us a preferred partner. As the energy system evolves, our focus on the fundamentals and investments in an integrated and diversified portfolio of advantaged businesses, anchored in a common set of core capabilities, positions us for industry-leading success.

The strategy that we've developed, the organization we've built, and the businesses we're focused on position us to grow and create value for many decades to come, all while helping the world realize its ambitions to build a lower-emission economy well into the 21st century.



As a global leader in the production and export of urea and ammonia, Fertiglobe is powering the industries of tomorrow and leading the decarbonization of industry, food, transport, and energy.

Introduction

Established in 2019 as a strategic partnership between ADNOC and OCI Global, Fertiglobe is currently the world’s largest seaborne exporter of urea and ammonia combined, and the number one producer of nitrogen fertilizers by production capacity in the Middle East and North Africa (MENA) region. As a leader in merchant ammonia and early mover in low-carbon ammonia projects, Fertiglobe also aims to play a role in the decarbonization of industry, food, transport, and energy, and it is ideally placed to further strengthen its leadership position in the coming years as the demand for renewable and low-carbon ammonia continues to grow. Fertiglobe is headquartered in Abu Dhabi, incorporated in Abu Dhabi Global Market (ADGM), and it has been listed on the Abu Dhabi Securities Exchange (ADX) since October 2021. Fertiglobe is committed to being an environmental steward and to capturing the significant opportunity offered by the global shift to cleaner energy sources. With ammonia’s end markets covering food, fuel, and feedstock, the company believes that low-carbon and renewable ammonia represents an opportunity to decarbonize a sizable portion of today’s global greenhouse gas (GHG) emissions across agricultural, industrial, and transportation sectors.

Projects

Egypt Green Hydrogen/ Ammonia
Egypt Green is Africa’s first integrated green hydrogen plant and marks a foundational step in Fertiglobe’s green hydrogen and ammonia portfolio aiming to accelerate global climate action through emissions reduction. The project aims to establish a hydrogen production plant based on water-electrolysis technology with 100MW capacity powered via a high voltage substation connected to the Egyptian Electricity Transmission Company (EETC) grid. The plant will be powered by 250+ MW of solar and wind to produce up to 15,000 tons of renewable hydrogen per year as feedstock to the ammonia production facility of Egyptian Fertilizers Company (EFC) – a 100% Fertiglobe owned ammonia & urea production facility in Egypt, to produce up to 90,000 metric tons of green ammonia per annum. The electrolyzer plant and renewable power supply assets are being developed by Fertiglobe, Scatec, Orascom Construction and The Sovereign Fund of Egypt (TFSE) is backed by several international financial institutions. Considered as a flagship project for COP27, the project has been benefitting from the highest level of government support. The project received ISCC Plus Certification for renewable ammonia production from Fertiglobe’s Egypt facilities in Q4 2022 and when fully developed will be RED II compliant. In parallel, Fertiglobe is developing the first phase of Egypt Green. A 15MW plant using PEM technology, making it one of the first of its kind. Critical hydrogen tie-ins to existing ammonia plants were developed. The first phase was commissioned in November 2022 and in Q2 2023 was producing green hydrogen and successfully injecting into EFC to produce green ammonia.

Project Crystal

The consortium of Fertiglobe, Abu Dhabi Future Energy Company (Masdar) and Engie are developing a 150MW electrolyser facility for the production of green hydrogen, to supply Fertiglobe’s existing ammonia plant at Fertil, Fertiglobe’ s UAE operating company. . The 100MW electrolysis capacity will produce around 9,000 tons of renewable hydrogen per annum as feedstock to Fertil, to produce around 50,000 metric tons of green ammonia per annum. The renewable electricity will be generated across several existing renewable generation facilities in the region with a total of approximately 100MW and 125MW of wind and solar PV capacity respectively, all dedicated to supplying the project. The following are ongoing projects demonstrating tangible actions and leadership in the low carbon ammonia space:



- **Low Carbon Ammonia Project in the UAE:**
In partnership with Ta’aziz (majority owned by ADNOC and ADQ), GS Energy Corporation and Mitsui & Co. Fertiglobe is developing a 1 million tons per annum of low carbon ammonia plant in Ta’ziz Industrial Chemicals Zone. Significant progress was made in early 2023, with the announcement of the signing of the shareholder’s agreement, following which Fertiglobe, on behalf of the project, signed the Engineering, Procurement and Construction contract with Tecnimont S.p.A
- **Low Carbon Ammonia Pilot in the UAE:**
pilot project to capture 18 ktpa of CO2 from Fertiglobe’s Fertil 2 plant to be used for CCS (first time in the UAE) to produce low carbon ammonia.

As the climate change discussion progresses, capturing methane remains a focal point of decarbonization efforts. The need for energy is increasing each year mainly driven by demand in non-OECD countries. According to the IEA, 775 million people do not have access to electricity and this number is increasing. Based on this fact alone, we believe peak oil demand has not been reached. Human reliance on fossil fuels will continue for many years to come, and these growing economies will need reliable, cost-effective energy.

Recently, the United Nations’ Intergovernmental Panel on Climate Change predicted emissions will peak before 2025 and called for reductions including the limitation of fossil fuel usage. What the experts don’t always acknowledge is the technology to capture emissions at the wellsite is available, and venting and flaring can be eliminated. The solution to Scope 1 and Scope 2 emissions is vapor recovery. A responsibly produced barrel of oil (“green barrel”) is achievable with a Flogistix Vapor Recovery Unit (VRU). As upstream and midstream operators implement VRUs at their tank batteries and production facilities, they quickly realize that the high MMBTU gas captured not only eliminates their methane and VOC emissions at the point of production but also provides an attractive economic return.

According to the Energy Institute’s Statistical Review of World Energy, in 2023, fossil fuels continue to dominate as the primary energy source worldwide maintaining 82% of the total share. With natural gas remaining flat, oil has rebounded, reaching a consumption level near pre-pandemic levels. Historical data shows consumption in 2010 was 87%. At this rate of decline, fossil fuel consumption will not reach zero for nearly 200 years.

Flogistix utilizes data and technology to help oil and gas producers capture emissions to reduce environmental impact while increasing revenues. As the leading provider of vapor recovery units, Flogistix designs, builds, and maintains VRUs all across the world. Using advanced compressor technology, Flogistix equipment puts an end to the need to vent or flare and allows operators to develop their oil and gas resources efficiently and economically.

High runtime is essential for effective vapor recovery. Based on our years of experience of working with the largest E&Ps in the United States, we have designed our equipment to run consistently in a variety of challenging environments, and we currently maintain an industry-leading runtime in excess of 99%. In 2022, the positive environmental impact of our fleet of approximately 3,000 VRUs in the United States across the various shale basins was in excess of 10 MMTs of CO2e.

Using both petroleum engineering expertise and cloud computing technology, Flogistix can design a highly intelligent vapor recovery unit that provides full transparency on how the VRU is running. Our proprietary LOGIX PLC creates a “Smart” VRU that allows the unit to operate in a variety of conditions and also allows the operator to adjust the unit remotely, eliminating unnecessary trips to the field. Our FLUX dashboard gives real-time insight into fleet operations allowing customers to better monitor runtime and maximize investments. FLUX can be accessed on a laptop or mobile device and provides a variety of reports that can be shared throughout the company.

The data compiled by a Flogistix VRU is valuable to those companies addressing sustainability concerns. While the current drive to energy transition is changing the oil and natural gas industry in ways many never anticipated, technology developed by the Flogistix team provides vital statistics regarding environmental sustainability. Stringent regulations and the influence of ESG initiatives on markets are forcing companies to assess sustainability, risk, and ethical practices on operations. This movement is changing the criteria used by investors when determining what is a suitable investment. Flogistix data provides prompt and accurate emissions management details suitable for Sustainability reporting.



- Partnering with Flogistix allows producers to:**
- Eliminate venting and flaring;
 - Comply with applicable regulations;
 - Provide an additional revenue stream from these valuable vapors; and
 - Provide investor confidence with responsibly produced oil.
- Flogistix VRUs can also be designed to capture methane emissions from sources of renewable natural gas such as landfills and dairy farms. Let our team of engineers, technology experts, and other specialized professionals provide vapor recovery and other atmospheric solutions for your emissions needs.

HONEYWELL IS LEADING THE ENERGY TRANSITION THROUGH TECHNOLOGY INNOVATION AND A CENTURY WORTH OF EXPERIENCE AND EXPERTISE

Honeywell

Stand: 4150

Hall: 4

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www.honeywell.com

Learn more by scanning the QR code.

When you think about sustainable energy, you probably picture fields filled with solar panels, mountainsides covered with wind turbines and highways occupied by electric cars. These are important elements of our world's ongoing energy transition, for sure.

But the evolution to a lower-carbon economy also includes reducing the environmental impact of hard-to-abate industries like heavy-duty road transport, oil and gas, aviation, shipping, steel, aluminum, cement and chemicals.

Moving forward in any meaningful way means finding ways to shrink these industries' environmental footprints without affecting their ability to deliver the products and services essential to our quality of life. Sustainable transition for the oil, gas and wider energy industry is a top priority for any countries that are serious about meeting Net Zero targets. This will be a key focus for Honeywell at the Abu Dhabi International Petroleum Exhibition and Conference (ADIPEC), which will take place from 02-05 October in the UAE capital. The mega gathering of energy leaders and specialists will highlight the need for faster, collective, decarbonization.

Events like ADPIEC and COP28 in Dubai in November, will be important opportunities for Honeywell to demonstrate its ready now innovations that are making sustainable attainable for the energy sector today. Honeywell continues to transform the energy industry, solving customers' toughest challenges through relentless innovation and

digital technology that is grounded in a heritage of invention.

While pursuing its own goal of becoming carbon neutral across its operations and facilities by 2035, Honeywell is supporting sustainability initiatives declared by regional governments including the UAE and Kingdom of Saudi Arabia. In 2019, Honeywell was selected as ADNOC's partner for improving asset and machinery management across its upstream and downstream operations as part of a 10 year agreement. Through the use of its AI technologies for asset monitoring and predictive analysis, Honeywell has been supporting ADNOC's digital transformation to help maximize the uptime, efficiency, predictability and performance of operations. Honeywell has also been supporting ADNOC for many years through localization initiatives that focus on the development of skills, knowledge and capabilities of local UAE workforces, to ensure greater sustainability for years to come.

At Honeywell, a world-class teams of engineers are actively pursuing innovations to help customers in heavy industries achieve their sustainability goals. The company has created proven solutions to drive energy transition in such areas as carbon capture, utilization and storage; sustainable aviation and diesel fuels; hydrogen recovery; and energy storage. Many of the technologies needed for the energy transition are not new – they're built on the foundation of proven technologies applied in new ways.

Carbon capture, utilization and storage

Honeywell UOP pioneered carbon capture, utilization and storage (CCUS) technologies that can reduce carbon dioxide (CO₂) emissions from coal-fired power plants, iron and steel mills, cement plants and other industrial facilities. The CCUS process captures CO₂ from flue gases so it can be safely moved, reused or stored. More than 15 million tons of CO₂ per year are currently being processed using our technology and our customers have the capacity to capture 40 million tons annually through our installed projects.

Sustainable Aviation Fuel (SAF)

Honeywell pioneered SAF production with its Ecofining™ technology. Initially, the process used animal fats, vegetable oils, waste cooking oil, algae oil and other noncompeting feedstocks to produce highly efficient biofuels. Now, our new ethanol-to-jet fuel process builds on that original innovation to support the global aviation sector's efforts to reduce GHG emissions and meet SAF production targets with an abundant feedstock like ethanol. Honeywell's UOP eFining - the latest technology in a line of offerings that are driving the decarbonization of the aviation sector - is a methanol to jet fuel (MTJ) processing technology that can convert eMethanol to eSAF reliably and at scale.

Hydrogen Production and Transportation

Hydrogen is a game-changing green energy source with a diverse range of applications, including industrial and transportation uses. Demand for hydrogen is expected to grow 5-7-fold over the next 30 years. Honeywell has developed a portfolio of differentiated low-cost solutions to enable customers to decarbonize through clean hydrogen energy. Honeywell Blue Hydrogen and Carbon Capture solutions can deliver between 55-90% CO₂ capture and emissions reduction. This includes "back-end" hydrogen purification and carbon dioxide separation that can be optimized for any end use application.

In April of this year, Honeywell announced Honeywell Liquid Organic Hydrogen Carrier (LOHC), a solution that enables the long-distance transportation of clean hydrogen. This cost-effective solution can help meet the growing requirements for hydrogen use across various industries by leveraging existing refinery and transportation infrastructure.

These are just some of the examples of solutions that Honeywell will showcase at ADIPEC 2023. The event will display the need for the energy sector to actively implement cutting-edge technologies now to shape a more sustainable future together.

IMMEDIATE CLIMATE ACTION
THROUGH ELIMINATION OF
FINANCIAL BARRIERS



To date our impact equals 9.9 million tons of CO₂e removed and 72 million euros of carbon-credit finance generated. From 2023 to 2030 we aim to achieve emission reductions of over 61 million tons of CO₂e. Our success so far is largely attributed to our multidisciplinary team which is adept at operating under challenging conditions and brings over two decades' experience in monetizing emission reductions and deploying finance in innovative ways.

Since January 2023 we have been working as a strategic partner of Climate Investment (CI), formed by the Oil and Gas Climate Initiative (OGCI), a specialist investor which comprises the 12 largest oil and gas majors which account for around 30% of global operated production: Aramco, bp, Chevron, CNPC, Eni, Equinor, ExxonMobil, Occidental, Petrobras, Repsol, Shell and TotalEnergies. This partnership lends us a matchless position in the sector to generate large-scale emission-reduction impacts and share strategic and technical know-how with our clients.

ICA-Finance was born as a result of the demerger of Carbon Limits AS in 2021. Our projects were previously implemented under the UNFCCC Clean Development Mechanism (CDM) and are currently developed under the EU Fuel Quality Directive (FQD) offset scheme. We maintain a strong partnership with Carbon Limits which continues its work as a world-class environmental consultancy also based in Oslo. In addition, we develop partnerships with regional and sectorial entities depending on individual project needs. One example is our standing partnership with the Iraqi Green Climate Organization (IGCO), a non-profit governmental organization based in Baghdad, Iraq.

We concentrate our expertise on three project types: (1) leak detection and repair, (2) flare gas recovery and (3) vapor capture from upstream hydrocarbon storage tanks, pre-treatment facilities, gas processing plants, and loading stations. We typically begin projects with a hands-on inventory of the target facilities, then advise the client on all possible emission reduction projects. Next, we provide the upfront project financing and contract the third-party service providers, manage the projects, and create verified emission reductions. On a case-by-case basis we may offer CapEx financing, the amount and availability depending on external financial partners, as well as investments to enable broader emission reduction programs with even greater impacts.

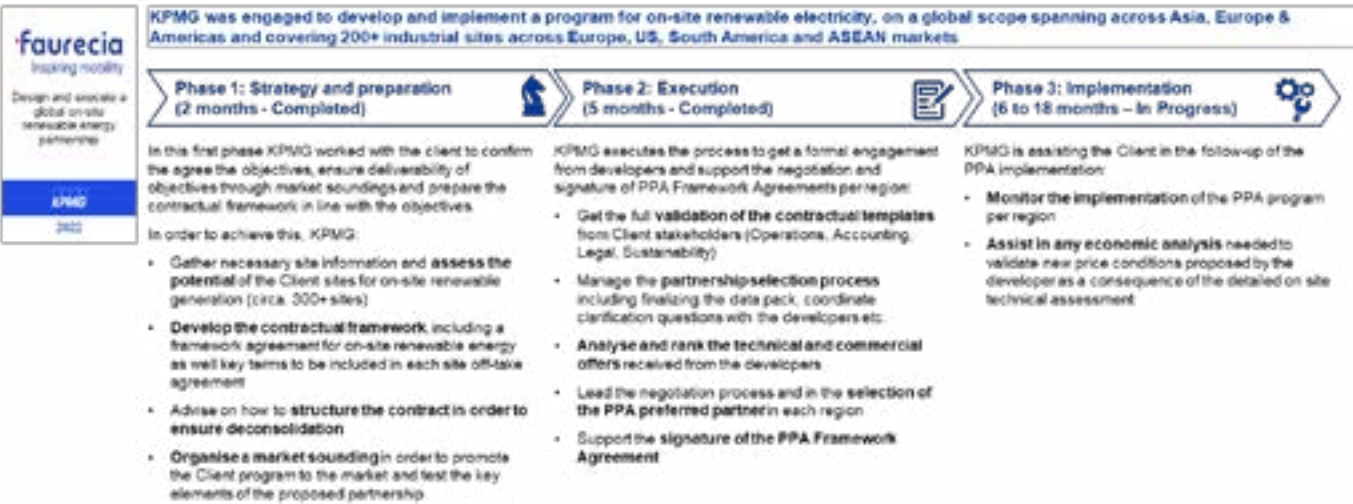
ICA-Finance only engages in climate mitigation at existing oil and gas infrastructure with significant emission-reductions potential. We stay away from projects that expand oil and gas production capacity. In the context of the energy transition, we are conscious of not engaging in activities that would represent oil and gas “lock-in.”

Our niche focus, combined with the support of key stakeholders, holds the potential to help mitigate emission reduction challenges at a large scale, and make a substantial positive impact on the environment.

We welcome outreach from stakeholders with the same (or a similar) mission to jointly bring about impactful momentum that lasts long after the projects end.

We lead the partnership process for Faurecia for decarbonizing its operations across 200+ sites

French tier-one supplier – On-site PPA Program



Most businesses are now convinced that they will have to reduce their carbon emissions and they are increasingly making net zero a concrete goal. Meeting this challenge will require a thorough examination of technologies and business models and no one business can get there on its own.

Partnerships, whether public-private or private-private, is an effective way to develop new solutions so that we can increase efficiencies and reach international climate goals:

Public-private partnerships: Green infrastructure has successfully been delivered through collaboration between the public and private sector, whether through design, construction, operations, maintenance or finance, and this partnership is more important now than ever. Below are the key lessons learnt of delivering successful partnerships:

- The **legal and policy frameworks** that governments put in place are enablers that support faster expansion of green partnerships and instil confidence in the private sector

- **Maintain flexibility in partnerships** as there is no one-size-fits-all partnership model that can ensure value for money, budget certainty, affordability and sustainable long-term outcomes

- The **allocation of risk** is a recurring challenge in large-scale partnerships. Ideally, the party best placed to manage a specific risk should do so and be remunerated for it

Private-private partnerships: Companies are realising that their core operations may not deliver the value-for-money outcomes for decarbonisation therefore looking for partnership for expertise, capital deployment and execution.

KPMG has been working on such partnerships and above is a recent example of our work.

LUKOIL GROUP DECARBONIZATION STRATEGY

The LUKOIL Group's climatic strategy was developed in 2019 as part of the corporate strategic development program in response to the global trends in energy transition. The strategy paves the way for adapting the LUKOIL Group's business model to the consequences of climate change and is tailored to the opportunities offered by the production of new low-carbon products and services.

LUKOIL is focused on the use of best practices that the Company is planning to leverage in order to achieve its climate goal. LUKOIL Group entities became the foundation for creating production service units that now act as competency centers to support key operations of the LUKOIL Group's oil and gas production, oil refining, gas processing and petrochemical enterprises.

Production service units are intended to provide smart services based on the continuous improvement framework principles for all-round asset performance enhancement, introduction and dissemination of best practices. In 2020, the units implemented more than 300 innovation (venturing) projects that address nine UN sustainable development goals.

In addition, a Decarbonization Laboratory was created in one of the units to develop and test promising projects and technologies. The lab is supposed to conduct scientific research in cooperation with technology partners, and analyze the performance of key projects.

Examples:

Development of an integrated flue gas recycling technology with the use of micro algae and conversion of micro algae biomass into biofuel (bio-oil).

The Company's specialists working in cooperation with one of the universities carried out applied scientific research to cultivate micro algae in a CO₂ rich environment, and to accumulate a bio-component.

The use of gaseous CO₂ for the production of bio-fuels will help cut CO₂ emissions at both oil and gas production facilities, and help consumers using transportation vehicles reduce their CO₂ footprint.

As part of the work, the parameters influencing the growth of micro algae biomass were studied, and strains for maximized lipid oil accumulation were identified. A lipid oil sample, – a biocomponent to be possibly utilized as part of diesel fuel for biofuel production purposes, was developed. The Company's scientific research laboratory conducted a survey on a pilot plant, which demonstrated that lipid oil can be used as one of the raw materials for diesel fuel hydrotreating.

In 2023, efforts were initiated to submit a patent application to utilize CO₂ as part of the biocomponent (micro algae) cultivation process. Plans include further R&D efforts to evaluate possible use of this technology to create a pilot unit and deploy it at Company Group facilities.

Energy efficiency improvement

LUKOIL's specialists developed and patented energy efficiency improvement technologies for process furnaces being the most energy intensive refinery equipment. Patents were obtained for the following solutions:

"A blast cleaning agent for the surfaces of heat exchanger furnaces and boilers." The above technology helped cut CO₂ emissions by 17 thousand tons per year.

"Energy saving coatings with thermal indication for metal surfaces." The coating helps reduce heat loss by lowering the infra-red radiation into the environment. The above technology helped cut CO₂ emissions by 1.2 thousand tons per year.



CO₂ capturing and utilization

LUKOIL's specialists were involved as experts in a preliminary feasibility study to utilize carbon dioxide from flue gases at the Company's facilities. Solutions were proposed to optimize and improve the CO₂ separation process by injecting CO₂ into formations for enhanced oil recovery and long-term burial purposes.

This effort will result in proposals on the ways of capturing CO₂ and its chemical utilization (producing low-carbon footprint products), preparing the formation for injection as an alternative way of utilization, and preparing it as a commercial product to be sold to internal and regional market consumers.

Development and implementation of CO₂ Huff & Puff injection technology with the use of a solvent

The technology is being developed to improve performance of high-viscosity heavy oil production involving the injection of various hydrocarbon solvents and carbon dioxide.

In 2022-2023 solvents were selected and tested, the research of CO₂ influence on viscous oils was conducted, CO₂ was injected with solvents based on formation models, and the best possible CO₂ injection technologies with solvents were proposed. In 2023, field tests will be conducted to test the improved CO₂ Huff & Puff injection technology with the use of a solvent.

SUSTAINABLE AVIATION FUEL INVESTMENT AND FEEDSTOCK CALCULATIONS BY MICROALGAE APPLICATIONS WITH BIOREFINERY APPROACH

Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions.

Carbon Asset Development (Project origination, Asset development and validation/verification, Monetization of the asset, brokerage and trading services) Climate Change Risk Management (GHG inventory management and emission reduction strategies to reach Net Zero) Climate Finance Advisory Service (Financial innovation for climate change management)

How does your decarbonisation-related product, process or solution benefit the industry or users?

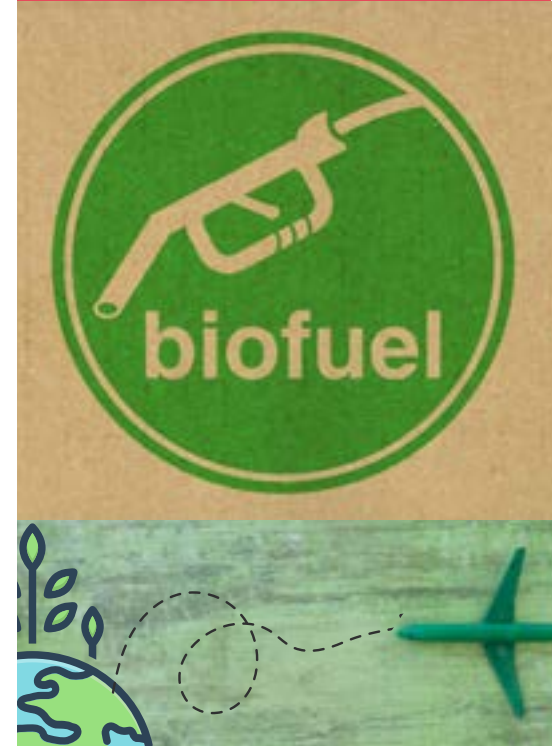
Mundo Verde Climate is a carbon credit developer and advisory firm that helps businesses and organizations reduce their carbon emissions and offset their remaining emissions by investing in high-quality carbon projects. Mundo Verde Climate is committed to helping businesses and organizations reduce their carbon emissions and achieve their sustainability goals. The company's services are based on a deep understanding of carbon markets and the latest carbon offset methodologies. Mundo Verde Climate also has a strong track record of success, having helped a number of businesses and organizations reduce their carbon emissions and offset their remaining emissions.

Please provide any examples of how your decarbonization-related product, process or solution has been used in the field and what sort of impact it has or can have.

As a product: SAGE is driving the transition towards a more sustainable, low-emission future for the petrochemical industry and the world at large. Our mission is to become a leading company in carbon-neutral certification. We aim to support various organizations, particularly commodity traders and oil companies, in their transition to a low-carbon standard. Overall, we encourage sustainable practices, promote the reduction of greenhouse gas emissions, and actively collaborate with our partners to combat the effects of climate change. Projects: Renewable Energy Projects, Biogas Projects, AFOLU projects



www.mv-climate.com/project





Stand: 4270

Hall: 4

www.nabors.com

1. Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions

Tackling scope one emissions from oil and gas operations requires innovative, purpose-built technologies that are economic and scalable. Nabors has commercialized multiple technologies under the Nabors Energy Transition Solutions (NETS) product line that lower fuel costs and emissions from drilling operations. This expansive portfolio of technologies includes emissions reporting, fuel enhancers, AI-based engine management systems, energy storage technologies, and highline power solutions. As importantly, these products were designed to be deployed on any drilling rig, regardless of rig manufacturer.

2. How does your decarbonisation-related product, process or solution benefit the industry or users?

The International Energy Agency (IEA) recently reported that 15% of global energy-related emissions come from oil and gas operations. These scope one emissions are low hanging fruit that many oil and gas companies are focused on minimizing or zeroing out, evidenced by recent net zero pledges and GHG emissions targets.

In support of this, we have implemented these technologies on Nabors rigs, effectively supporting our own environmental initiatives while simultaneously contributing to the sustainability goals of our customers (oil and gas operators). As importantly, Nabors has purposefully made these solutions rig agnostic, meaning they can be deployed on any rig, even those owned by companies that would have traditionally been considered a competitor of ours.

3. Please provide any examples of how your decarbonisation-related product, process or solution has been used in the field and what sort of impact it has or can have.

Customers in the Middle East have recently conducted successful trials of these solutions. Among them is nanO2® fuel enhancer, a highly effective fuel additive designed to optimize the performance of rig engines. Using the nanO2® fuel enhancer, fuel efficiency and carbon emissions improve up to 8% without expensive engine modifications. This proven technology delivers tangible benefits regarding environmental impact and operational cost savings.

The nanO2® fuel enhancer also delivered an average increase in fuel efficiency of 5.3% across five drilling rigs in Columbia, resulting in a total of 250 metric tons of carbon emissions saved. The product was also recently used on a completion operation in West Texas, yielding a 5.4% increase in fuel efficiency.

With a focus on enhancing workers' visibility and overall wellsite illumination, the Canrig ILLUMIC® Lighting System has been successfully installed for customers in Saudi Arabia. It incorporates energy-efficient and maintenance-free LED fixtures. ILLUMIC is a LED crown-mounted lighting system that increases LED life span to over 10 years, lowers overall noise by reducing generators at the rigsite, saves fuel and lowers carbon emissions.

The SmartPOWER™ engine management system, like the auto-start and stop feature on modern vehicles, uses AI to analyze live rig data and automatically run the optimal number of engines to meet the rig's forecasted power demand. The implementation of SmartPOWER™ technology in South Texas optimized the diesel power generation system by automating the number of generators needed to meet the forecasted demand. This innovative approach resulted in 15% reduction in engine run hours, 6% reduction in fuel savings usage and 24 metric tons of carbon emissions saved.

The PowerTAP™ highline power transformer module, used to plug the rig into the local power grid, virtually eliminates scope one rig emissions. PowerTAP is currently deployed on 20 rigs. Recently, Hess electrified its entire Nabors rig fleet operating in North Dakota using the PowerTAP module.

In summary, the NETS portfolio provides economic and environmental benefits. By improving energy efficiency and reducing fuel consumption, costs and emissions are minimized.

In recognition of our efforts to lower the carbon intensity of drilling and of our investments in alternative energy sources and innovative technologies, Nabors received the Energy Transition – Upstream award at the 2022 Platts Global Energy Awards.

Nabors was named "Service Provider of the Year" and "Highly Commended for Sustainability Initiative of the Year" at the 13th Annual Oil & Gas Middle East Awards, held in Dubai on March 2, 2023. Our 2022 emissions targets were to reduce Scope 1 GHG emissions per foot drilled for Nabors Drilling USA and Nabors international rigs by 7.5% and 5%, respectively, using a 2020 baseline. We are proud to report we reduced our Scope 1 GHG emissions per foot drilled for

Nabors Drilling USA by 8.8% from our baseline year of 2020 and we reduced our Scope 1 GHG emissions per foot drilled for Nabors international rigs by over 30% from our baseline year of 2020.

Our 2023 targets include, achieving 41.7 lbs CO2 per foot drilled or a 3% reduction in Scope 1 GHG emissions intensity for Nabors Drilling USA in 2023, using a 2022 baseline and 89 lbs CO2 per foot drilled or a 3.7% reduction in Scope 1 GHG emissions intensity for Nabors international rigs in 2023, using a 2022 baseline.

4. How will you be promoting your decarbonisation efforts at ADIPEC 2023?

Nabors is a decarbonisation zone sponsor at ADIPEC 2023. Our subject matter experts will be on hand at stand 4270 to showcase our automated technologies and decarbonisation solutions that can elevate drilling operations and lower carbon emissions.

Guillermo Sierra, Vice President of Strategic Initiatives and Energy Transition is part of a decarbonisation webinar (held last week of August- dates to be confirmed by DMG). Guillermo will provide valuable insights on our energy transition strategy and our approach to venture investments. Nabors has made nine venture investments in disruptive companies helping achieve clean, renewable and dispatchable energy.

James Hall, Sr. Director of Energy Transition is part of a panel discussion at the ADIPEC Decarbonisation Innovation Sessions held at the decarbonisation theatre. Monday, October 2, James along with other industry leaders will lead discussions on leveraging existing technologies to lower emissions from drilling operations.

NAYARA ENERGY'S HOLISTIC SUSTAINABILITY APPROACH: LEADING THE WAY TOWARDS A GREENER, SAFER, AND INCLUSIVE FUTURE

Nayara Energy, a downstream company of international scale, is leading the way in sustainable practices across various domains, ranging from renewable energy to environmental conservation, waste management, safety, inclusive development and best-in-class governance practices. With an intent to further embed sustainability into the core functioning of the organisation, the Company undertook a meticulous materiality assessment activity covering 21 Environment, Social, and Governance (ESG) topics concerning the downstream oil and gas sector as per international sustainability frameworks. The assessment was designed to be overarching and encompassed the diverse perspectives of 6 cohorts of stakeholders – local communities, regulators, lenders, investor groups, employees and management. In the realm of renewable energy, Nayara Energy is making impressive strides. Their ambitious plan to establish a 10 MW Captive Solar Power Plant at the Vadinar Refinery in Gujarat is poised to significantly reduce carbon emissions by about 20,000 metric tonnes annually. Additionally, the company has already completed the installation of a 500-kW captive solar power plant at its Pali fuel depot in Rajasthan, effectively preventing 730 metric tonnes of CO₂e emissions each year. In Maharashtra, Nayara Energy commissioned its first 300 kVA solar power plant at the Wardha depot in March 2019, resulting in an annual saving of 550 metric tonnes of CO₂e emissions. Moreover, as part of their commitment to cleaner energy sources, Nayara's franchisees have converted 300 retail outlets to solar power, collectively generating 2 MW of clean energy. These endeavors underscore Nayara Energy's dedication to sustainability and environmental responsibility, setting a commendable example for the industry.

In 2022, Nayara Energy achieved a 10% ethanol blending rate in its gasoline sales, reducing CO₂e emissions by an impressive 220,000 tons per million KL of blended gasoline. The company is also investing in substantial grain-based ethanol production plants to manufacture its own bioethanol in the near future, reinforcing its commitment to sustainable energy solutions.

Over the past decade, Nayara Energy has undertaken a commendable initiative to nurture 175 hectares of mangrove plantations in the adjacent coastal regions. This voluntary commitment reflects their dedication to conserving regional biodiversity and establishing substantial 'carbon sinks' that enhance the local environment. Furthermore, within the premises of Nayara Energy's Vadinar refinery, a thriving 'green belt' adorned with over 300,000 trees flourishes. The company's forward-looking goals include planting an additional 100,000 trees in the coming years, solidifying their commitment to a greener and more sustainable future while actively participating in environmental preservation and rejuvenation efforts.

Nayara Energy excels in water management within India's refining sector. They meet over 85% of their water needs through seawater desalination, avoiding groundwater extraction, treating all wastewater with zero hydrocarbon content, and maintaining a substantial rainwater harvesting pond with a capacity of 120,000 megaliters. In corporate social responsibility (CSR), Nayara Energy has prioritized water resource management in 15 nearby villages. Through their Gram Samruddhi CSR program, the company has implemented various initiatives aimed at water conservation and sustainability, including drip irrigation systems, soil moisture conservation techniques, and storage/recharge infrastructure. As a result, local communities now boast an impressive water storage capacity of around 18 million cubic meters, significantly enhancing water security.

Nayara Energy's Vadinar refinery also excels in waste management, with 92% of generated waste reprocessed internally, 3% sold to cement manufacturers for co-processing, and another 3% recycled through government-certified recyclers. Furthermore, in 2022, Nayara Energy achieved a significant milestone of 50 million LTI-free (Lost Time Injury) man-hours at its Vadinar refinery, setting a noteworthy global record. The company's commitment to occupational safety is evident in its aspiration for zero fatalities across all operations, supported by best-in-class KPIs compared to global and domestic peers, with a Total Recordable Incident Rate (TRIR) consistently below 0.6. The refinery has also maintained an impeccable record of zero tier 1 process safety events. Additionally, Nayara Energy has equipped more than 400 retail outlets with Vapor Recovery Systems (VRS), effectively preventing vapor emissions into the atmosphere, ensuring customer health and safety, and contributing to the mitigation of environmental impact from volatile organic compounds (VOCs).



www.nayaraenergy.com



Lastly, Nayara Energy has demonstrated a robust commitment to enhancing energy security in underserved regions of India, particularly in the North and North-East. In the fiscal year 2022, the company constructed 211 fuel retail outlets in these remote areas, providing essential energy resources and facilitating economic growth.

Nayara Energy's proactive policies also extend to inclusive development, with a preferential procurement policy that supports local communities by sourcing materials and services from vendors in 34 nearby villages. Moreover, the company actively supports Indian Micro, Small, and Medium Enterprises (MSMEs), procuring over 25% of the total value of its non-hydrocarbon requirements from these enterprises. These practices not only contribute to economic empowerment but also reinforce Nayara Energy's commitment to inclusive and sustainable development.

Positioning Sustainability at the Heart of the Business: NMDC Group's Energy Transition Commitment

As 2023 was declared the Year of Sustainability in the UAE, the importance of sustainability for the country and region has become even more evident.

For NMDC Group, sustainability is an unwavering commitment, deeply ingrained into our corporate DNA. Our sustainability vision encompasses our dedication to environmental protection, consistent innovation, and alignment with global decarbonization aims.

Green Energy Partnerships

NMDC Group's green energy ethos stems from a perfect blend of time-honored values and contemporary innovation. We deeply recognize the intrinsic value of our planet's resources and consider our dedication to sustainable practices both a tribute to our predecessors and a covenant with future generations.

Our groundbreaking collaboration with pioneers like Technip Energies has positioned us at the forefront of the energy transition landscape. We're channeling this partnership through joint venture NT Energies, to maximize green energy opportunities, focusing heavily on blue and green hydrogen production. Beyond hydrogen, we are also ambitiously venturing into pioneering projects ranging from waste-to-energy transformations to biorefining and advanced biochemistry.

We've also partnered with Technip Energies for the FEED phase of the Carbon Capture and Storage (CCS) project at the Kasawari offshore gas field in Malaysia, one of the largest offshore CCS projects in the world.

Tangible Actions for a Sustainable Tomorrow

Our energy projects also include installing monopole foundations for the 640 MW Yunlin wind farm, a clear demonstration of our endeavors in the renewable energy sector. In parallel, our mangrove restoration efforts in Abu Dhabi is a commitment not just to nature but also to the global community, signaling our allegiance to the broader climate goals set by global environmental agencies.

Our sustainability mission is far-reaching, extending beyond our corporate boundaries. By hosting extensive workshops, interactive sessions, and grassroots movements, we're democratizing sustainability, ensuring that every individual, regardless of their role in the community, is equipped and motivated for a green transformation.

The Power of Collaboration

A significant strength of NMDC Group's sustainability endeavors is our commitment to stakeholder engagement. We believe in a comprehensive approach, where feedback from every stakeholder, be it an investor, a partner, an employee, or a client, is invaluable. This collaborative effort helps us fine-tune our strategies, ensuring they're aligned with global best practices and local nuances.

When it comes to our employees, we've institutionalized continuous training, ensuring that every team member, from top-tier executives to on-field technicians, is well-versed with the latest in sustainable practices. This commitment underscores our belief: an informed team is the backbone of our sustainable vision.

In addition, we've seamlessly integrated sustainability and decarbonization into our foundational principles. Our dedicated R&D wings consistently scout for innovations, ensuring that our strategies are not only relevant for today's challenges but are also adaptable for those on the horizon.

Going Forward: NMDC Group's Vision

Looking ahead, NMDC Group has outlined a clear roadmap for the next three decades. By 2050, we aim to be a carbon-neutral organization, leading the MENA region in sustainable practices across all our operational domains. Our blueprint includes a mix of short-term tactical plans and long-term strategic initiatives, ensuring sustained progress towards our overarching goal.

Embarking on a Collective Journey to Sustainability



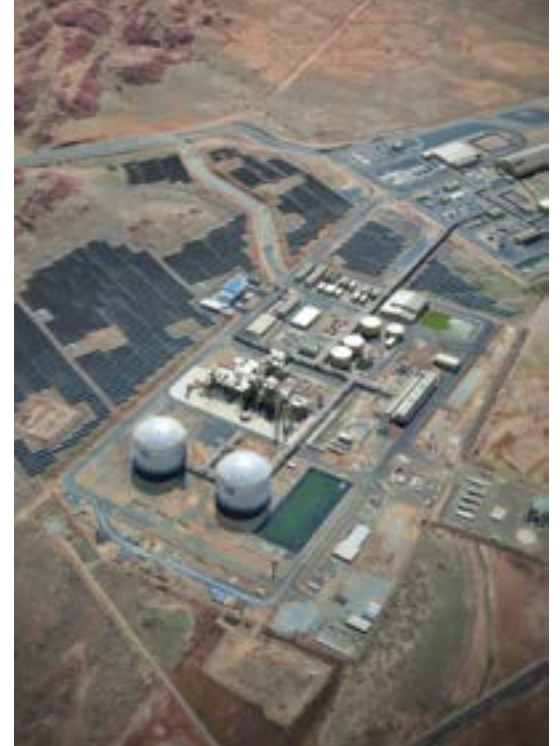
شركة الجرافات
البحرية الوطنية
NMDC

NPCC
شركة النفط والغاز
البحرية الوطنية

NMDC Group

Stand: 6130
Hall: 6

www.nmdc.com



NMDC Group prides itself on playing a vital role in supporting the UAE's Net Zero plan and is committed to contributing to the decarbonization of the Energy sector and wider UAE economy, while also building the necessary infrastructure to enable climate adaptation solutions and protect our communities from the risks posed by climate change. With Abu Dhabi taking the lead in green initiatives and hosting groundbreaking events like ADIPEC and COP28, NMDC Group strives to be a paragon of sustainable energy resource management. The path ahead is collaborative, and together, we can sculpt a legacy characterized by a greener, more sustainable future.



Introduction to Practical Decarbonization of Platforms and Rigs

The practical decarbonization of platforms and rigs in the oil and gas industry has moved from theory to action due to the urgency of addressing climate change. These offshore facilities have long been associated with significant carbon emissions, primarily driven by their reliance on fossil fuels. This document outlines the tangible strategies and on-the-ground steps required to effectively decarbonize platforms and rigs, aligning the industry with sustainable practices and global emission reduction goals.

The practical decarbonization of platforms and rigs holds immense importance for the future of the energy industry. Beyond the environmental imperative, it presents economic advantages such as improved operational efficiency, reduced operational costs, and enhanced reputation. By transitioning to cleaner operations, the industry ensures its resilience in an ever-evolving energy landscape.

Practical Strategies for Decarbonization

- Practical decarbonization starts with transitioning energy sources. Instead of merely discussing the shift, begin by replacing conventional diesel generators with hybrid systems that integrate renewable sources like solar panels and wind turbines. Collaborate with renewable energy providers to establish reliable energy supply.
- Incorporate practical battery storage solutions that can store excess energy during peak generation periods, ensuring uninterrupted operations even when renewable energy production is low.
- Practical electrification efforts involve tangible steps. Retrofit existing drilling equipment, pumps, and other machinery with electric alternatives. Collaborate with electrical engineering experts to integrate these components with renewable energy sources on-site. Work with local energy providers to ensure a consistent supply of renewable electricity, thus reducing direct carbon emissions from operations.
- The practical implementation of CCS entails more than theory. Collaborate with engineering firms specialized in CCS to design and install practical carbon capture equipment on exhaust systems.

Establish partnerships with transportation companies to create feasible solutions for transporting captured CO2 to storage sites. Collaborate with experts in geology and subsurface engineering to ensure the safe and efficient storage of captured carbon underground.

- Practical energy efficiency enhancements are not abstract concepts. Assess existing equipment and identify practical opportunities for replacement with energy- efficient alternatives. Collaborate with technology providers to integrate IoT sensors and monitoring systems into operations. This practical approach enables real-time optimization and alerts, reducing energy waste. Implement predictive maintenance strategies to identify potential inefficiencies and failures before they occur, minimizing downtime and energy consumption.

Short about in shipping sector - We can't stress enough on how severe the climate impact will be. If left unchecked, such carbon emissions can increase by 50-250% by 2050, according to an International Maritime Organization (IMO) study.

At present, the IMO is undertaking measures to prevent shipping emission-induced climate change. One of the important steps taken by IMO is to draft the Initial IMO GHG Strategy. Let's look at it in detail. Implementation and Challenges

The demand to substantially eliminate the 1,076 million tonnes (2018) of greenhouse gas (GHG) emissions , which includes carbon dioxide (CO2), methane (CH4), and nitrous oxide (N2O), expressed in CO2e[1] or CO2eq of total shipping (international, domestic and fishing) is often centred on assets like ships, engines, and alternative fuels. While these are valid considerations, it is essential to focus on the entire range of decarbonization enablers spread across clusters of value chains (VCs).

Three interrelated maritime VCs are playing a critical role in decarbonizing shipping: marine fuel, shipbuilding, and maritime operational value chains.

Implementation Challenges. Practical decarbonization faces a range of challenges. High initial costs are a significant barrier. To overcome

this, establish practical partnerships with financial institutions that specialize in renewable energy projects. Collaborate with governments to secure practical incentives, grants, and subsidies that can offset upfront investments. Develop practical training programs to ensure that your workforce possesses the necessary skills to operate and maintain the new technologies and systems.

Regulatory Support and Incentives. Practical collaboration with regulatory bodies is essential. Engage in practical dialogues with governments to advocate for supportive policies. Practical regulatory incentives, such as tax breaks and fast-track permitting processes, can significantly accelerate the adoption of cleaner technologies. Collaborate with industry associations to represent your practical decarbonization efforts and contribute to the development of practical industry standards.

Collaboration and Industry Leadership. Practical decarbonization requires industry-wide collaboration. Form practical consortia of oil and gas companies to pool resources, share practical experiences, and jointly invest in research and development. Practical industry leadership means setting quantifiable decarbonization targets and regularly assessing progress. Share practical case studies of successful implementation to inspire others and create a practical culture of innovation.

Conclusion. The practical decarbonization of platforms and rigs is a concrete, actionable endeavor. By transitioning to renewable energy sources, electrifying operations, implementing CCS technologies, and enhancing energy efficiency in tangible ways, platforms and rigs can tangibly reduce their carbon footprint. Through practical collaboration, regulatory support, and innovative strategies, the oil and gas sector can practically contribute to a sustainable energy future and effectively address the pressing challenges of climate change.

Stand: 15092
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Case Studies and Real-World Examples

Highlight a practical case study where a platform successfully transitioned to renewable energy sources. Provide practical details such as the type and capacity of renewable installations, energy storage solutions, and how the transition impacted emissions and operations. Showcase the practical collaboration with renewable energy providers that made this transition possible.

Detail a practical scenario where a rig's operations were electrified, reducing direct emissions. Describe the practical steps taken to retrofit equipment and establish a reliable source of renewable electricity. Highlight practical benefits such as emission reductions, operational efficiency gains, and potential cost savings.

Present a practical example of carbon capture and storage implementation. Discuss how practical partnerships were formed with experts in carbon capture technology, transportation, and subsurface engineering. Highlight the practical aspects of capturing, transporting, and storing carbon dioxide, showcasing the environmental impact of the initiative.

Share a practical energy efficiency success story where an offshore facility undertook equipment upgrades and implemented predictive maintenance. Provide practical figures on energy savings, reduced maintenance costs, and minimized downtime. Illustrate how real-time monitoring and predictive maintenance practices practically led to improved operational efficiency.

Conclusion

The decarbonization of platforms and rigs is an urgent and complex task, but it is an essential step toward achieving a sustainable energy future. By embracing renewable energy sources, electrification, carbon capture, and energy efficiency enhancements, the oil and gas industry can significantly reduce its carbon footprint while continuing to meet global energy demands. Through collective efforts, innovation, and a commitment to environmental stewardship, platforms and rigs can transform into models of sustainable energy production and contribute to the global fight against climate change.



Stand: A120
Hall: Atrium

www.oxy.com



Direct Air Capture (DAC) is a technology that removes carbon dioxide from the atmosphere. Using high-powered fans, air is drawn into a processing facility where the CO₂ is separated through a series of reactions. The CO₂ can then be either securely stored in underground reservoirs through geologic sequestration or can be used to make new products such as low carbon fuels, cements or plastics. Direct Air Capture is a vital technology for rapidly removing large volumes of CO₂ from the atmosphere to help achieve global climate targets. It is particularly important for hard-to-decarbonize industries such as aviation, maritime and long-distance trucking.

1PointFive's DAC facilities will be the largest of their kind, with our first facility, which is currently under construction in the United States, designed to capture 500,000 metric tonnes of CO₂ each year.

At ADIPEC, Oxy will have a stand featuring our subsidiary 1PointFive and their Direct Air Capture facility. We will showcase progress on our first Direct Air Capture facility as well as highlight our current and future development plans for DAC facilities and Sequestration sites. We will feature a virtual walkthrough experience of our Direct Air Capture facility, a 3D model of our facility supplemented with augmented reality and a video taking us into a sequestration reservoir showcasing a variety of CO₂ trapping mechanisms.

Additionally, Oxy will have several presentations and videos showcasing our strategy to achieve net-zero in our scope 1,2 and 3 emissions; highlighting initiatives and specific projects that are underway to reduce our operational emissions.

BRINGING AUTONOMOUS BATTERY STORAGE TO POWER OIL AND GAS DRILLING, LOWERING EMISSIONS

A "stealth" solution for oil and gas drilling emissions management

One of the toughest challenges to solve for decarbonizing drilling operations is balancing the need for power with the need to reduce the environmental footprint. Generators are essential to oil and gas drilling operations, but they use a lot of fuel and are a source of emissions. Our EcoCell® battery tech reduces the reliance on generators for fuel savings and emissions reductions.

At Patterson-UTI, we are achieving proven results from our EcoCell® lithium hybrid power management system with deployment within our operations across one of the largest fleets of land-based drilling rigs in North America. EcoCell® is one of many innovations we deliver for customers to achieve emissions reductions.

EcoCell® leverages stored energy to optimize fuel efficiency and reduce fuel costs. This battery storage system can also operate autonomously and independently, even when generators are offline. This ability differentiates EcoCell® from traditional battery energy storage systems (ESS) on drilling rigs that require at least one generator to be online to maintain a basic microgrid system.

Seeking a means to reduce emissions as well as noise, we developed stealth mode, which is capable of running a drilling rig exclusively off a battery energy storage system, during non-critical operations. This results in fuel and emissions savings, as well as improved generator life and improved overall efficiency.

Working Smarter, Not Harder

The implementation of this control system optimizes time with generators offline while minimizing the number of additional generator starts and adhering to battery discharge limitations.

That may seem simple, but EcoCell® is smarter, too.

When the battery system determines that the operation will not require significant power consumption, it automatically shuts down the last online generator and seamlessly switches to a grid-forming mode, where the batteries alone supply power to all rig equipment.

The rig will continue to operate without any generators until the battery state of charge drops to a certain threshold, at which point the system automatically starts a generator. When the additional generator comes online, it will run at high efficiency for a short period of time to quickly recharge the battery and prepare to enter stealth mode again.

Stealthy Reliability

EcoCell® stealth mode provides rigs with instantaneous power and the ability to operate without diesel or natural gas-fueled generators online for extended periods, while avoiding any impact on operations. Stealth mode provides performance improvements for rigs, in varying amounts depending on the respective specifics of a given operational scenario.

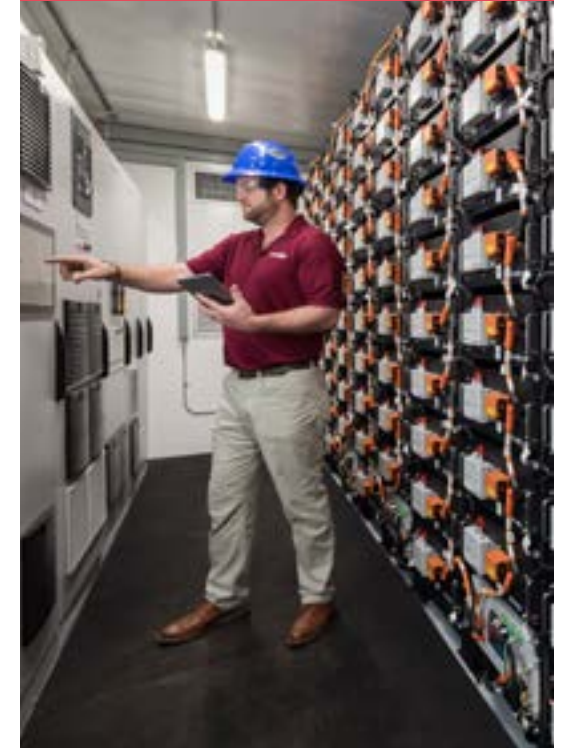
While drillers are committed to reducing emissions, they still require reliability. To achieve emissions reductions, other options include purpose-built control technologies, such as selective catalytic reduction (SCR) and diesel particulate filters (DPF). These are effective for targeting individual types of emissions, but do not broadly reduce all emissions.

To address emissions comprehensively, drilling contractors need multiple solutions that can deliver reductions across the board. A high-spec land rig may consume 550,000 to 650,000 gallons of fuel per annum and, by deploying EcoCell®, that volume could be reduced by more than 20%.



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www.patenergy.com



Lower Emissions, Smoother Operations

Our analysis of operational data with EcoCell® shows it reduces some types of emissions by more than half and reduces CO₂ emissions by approximately 1,000 metric tons per year per rig.

EcoCell® technology delivers other benefits as well. It enables maintenance intervals to be extended because fewer generators are run to carry out drilling activities. Depending on the price of fuel for the operator, fuel savings can offset the cost of the EcoCell® system.

The lithium-ion batteries in the system provide 584 kW-hours of energy storage, divided among six racks equipped with protection and monitoring technology. EcoCell® is equipped to handle the most demanding drilling conditions while optimizing emissions.

EcoCell® lithium battery hybrid energy management systems are running at several Patterson-UTI drilling rigs, and we are expanding their use within our fleet. We also are making this technology available to other drilling contractors that want to improve operations.

Patterson-UTI is a first mover and industry leader in providing critical-path services for oil and gas field operations. EcoCell® is an offering within our EcoVerse™ sustainable solutions to help its customers achieve their emissions-reduction goals.



Stand: 12242
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www.proman.org



1. Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions

Proman and ADNOC are developing the UAE’s first methanol plant in the TA’ZIZ Industrial Chemicals Zone. On completion, our world-scale Abu Dhabi plant will be one of the most technologically advanced and low-emission natural gas to methanol facilities in the world, unlocking new local manufacturing and value-add export potential and supporting the growing global demand for methanol as a cleaner source of energy. Methanol is emerging as a key enabler for the global energy transition, driven by its range of uses and proven decarbonisation potential. Its inherently cleaner-burning properties make it one of the most attractive low-emission alternatives to conventional fossil fuels today. Around the world it is already being used to decarbonise road, rail and marine transport, in power generation, and as a highly efficient hydrogen carrier. Case study: According to the International Maritime Organization, global shipping is responsible for around 3% of all greenhouse gas emissions. To become more sustainable, shipping must switch to cleaner fuels. Methanol has become one of the most popular and practical options, with record-breaking orders for methanol-fuelled newbuild and retrofit vessels in 2023.

Proman, via its joint venture with Stena Bulk, already has four industry-leading low-emission tankers operating on methanol today. Compared to conventional marine fuels, methanol:

- Eliminates particulate matter and sulphur oxide emissions;
- Reduces NOx emissions by up to 80%;
- Cuts CO2 by up to 15% (tank to wake), increasing to over 95% if using green methanol;
- Is 200x less toxic for marine life in the event of a spill;
- Is fully biodegradable and water soluble.

Methanol’s adaptability and compatibility with existing technologies make it an important contributor as we transition to a more sustainable and low-carbon future. With a proven and highly scalable net-zero pathway, methanol is an ideal bridge fuel to fully renewable energy in the coming decades. Proman leads the development of the market for methanol as a clean, biodegradable, and sustainable energy product. Visit our booth in the Decarbonisation Zone to find out more.

PTTEP’S DECARBONIZATION INITIATIVES AT ADIPEC 2023

PTTEP is on the path to building energy security and becoming a low-carbon organization. We set forth to reach Net Zero Greenhouse Gas Emissions by 2050 with our **EP Net Zero 2050** concept. This goal covers both direct emissions (scope 1) and indirect emissions (Scope 2) of the exploration and production business under PTTEP’s operational control. PTTEP also has set interim targets to reduce greenhouse gas emission intensity by at least 30% by 2030 and 50% by 2040 (from base year 2020) and to achieve **net zero greenhouse gas emissions in 2050**.

Under the EP Net Zero 2050 concept, we have established the following plans:

Exploring for Lower Carbon E&P Portfolio

The E&P Portfolio is managed to transform PTTEP into a lower-carbon organization. New projects with an emphasis on natural gas and greenhouse gas intensity will be factored into the investment decision-making process.

Production and Planet in Balance

PTTEP will pursue the development of technology to reduce greenhouse gas emissions from the production process, in particular **Carbon Capture and Storage (CCS)** which will dramatically reduce greenhouse gas emissions. The captured emissions will be injected and sequestered in the reservoirs located in the Gulf of Thailand and Malaysia, and will be the first of its kind in Thailand.

PTTEP initiated Thailand’s first CCS project study in 2021 at Arthit offshore gas exploration field in the Gulf of Thailand, aiming to capture a maximum 1 million tons of carbon dioxide equivalent per annum. PTTEP expects to execute CCS technology at Arthit Field in 2026 which will significantly reduce emissions from its petroleum production process. CCS project study is concurrently taking place at Lang Lebah field, in Block SK410B, a huge gas field in Malaysia discovered by PTTEP.

Aside, PTTEP is studying technology for Carbon Capture and Utilization, to convert CO2 into value-added products. One of our projects is **SEACURE**, which sequesters carbon in artificial reefs via a concrete curing technology that chemically converts CO2 into calcium carbonate (CaCO3) embedded in concrete. The artificial reefs integrated with CO2 curing is used as a way to conserve marine resources and increase biodiversity. Moreover, the additional application can be used for coastal erosion resistance.

Currently, the production volume of concrete artificial reef is estimated at 10,000 pieces per annum. Increased utilization of artificial reefs in Thailand and Southeast Asia is expected to increase that number to be 100,000 - 300,000 pieces. The SEACURE initiative can remove 2,800 to 8,400 tons of CO2 equivalent annually or the same amount as a plot of trees on a 1,680 - 5,040 acre piece of land, as well as being a way for the sustainable conservation of the coral reef ecosystem.

PTTEP also focuses on emissions offsetting through blue carbon solutions and the reforestation of trees forests and mangroves (Carbon Removal Project) which will increase the natural carbon sink with the target to absorb more than 2 MMTCO2 in 2050. **Ocean for Life projects** will be continuously conducted to improve the biodiversity abundance and marine ecosystems as healthy oceans to ensure that coastal ecosystems remain efficient sources of carbon sink.

Apart from Exploration & Production, PTTEP is also exploring beyond E&P business opportunities in response to the new landscape of the energy transition to foster business growth in the future with Advanced Technology, one of those opportunities identified is Smart Forest Solution which using “**Varuna**” Analytics platform, a multispectral drone, and satellites to manage green areas and monitor changes in



Stand: CN51
Hall: Concourse
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www.pttep.com



natural resources and the environment. Varuna has applied aerial imaging technology to monitor changes in green areas. Providing a new method of calculating carbon credit over large green area (Large Scale Carbon Credit Solution) by integrating satellite imagery technology, multispectral drone imagery and on-ground data to be used to process geospatial data with artificial intelligence (AI) technology through the “**Varuna**” Analytics platform and can monitor changes in green areas, preventing risks of wildfire and generating carbon credits for PTTEP’s offsetting activities.

These decarbonization initiatives are part of our endless journey towards PTTEP achieving net zero greenhouse gas emissions in 2050. Discover more of PTTEP’s innovation and technology and talk with our experts at PTTEP’s booth in ADIPEC 2023.


SAMSUNG

SAMSUNG ENGINEERING



Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions

We, Samsung Engineering, have introduced a circular economy model as a solution to the societal challenge of climate crisis. To supply clean energy and reduce carbon emissions, we are making strategic investments to secure early-stage technologies and promoting various flagship projects, globally. Regarding our early technology acquisitions, we are pleased to introduce three venture partners we have invested at the exhibition. This introduction will include novel technologies related to carbon capture and hydrogen production.

In our project development efforts, we are actively engaged in the entire clean energy value chain, covering hydrogen/ammonia production, and carbon capture and storage. To secure a reliable supply of clean hydrogen/ammonia, we are currently developing the H2biscus project in Malaysia and the Hydrogen Duqm project in Oman. In addition, we are advancing the Shepherd project, which is the first transboundary CCS initiative in Asia. This project involves the capture of carbon dioxides in South Korea and its subsequent transportation to Malaysia for underground storage.

How does your decarbonisation-related product, process or solution benefit the industry or users?

Samsung Engineering offers eco-friendly solutions, driving the circular economy through waste-to-energy, supporting emission reduction through process/energy optimization study for existing facilities, and adopting carbon capture, utilization and storage (CCUS) technologies to new projects. We also provide clean energy through the production, conversion and utilization of green and blue hydrogen. We are committed to becoming a company that takes proactive measures to accommodate the energy shift. Together with our clients, we plan and execute a phased roadmap to achieve the net-zero targets, securing core green energy technologies and developing flagship projects.

Please provide any examples of how your decarbonisation-related product, process or solution has been used in the field and what sort of impact it has or can have.

In alignment with the fast-developing energy shift paradigm, Samsung Engineering is expanding its presence in the green solution sector, offering decarbonization solutions. To initiate this journey, Samsung Engineering has formed strategic partnerships and investments with promising venture companies. These partners are diligently developing and showcasing their distinctive technologies to apply their new core values to emerging decarbonization sectors. Along with the core technologies developed by these companies, Samsung Engineering has been formulating a valued strategy to facilitate commercialization of these new decarbonization technologies. This includes hydrogen production through close joint development with the companies. Once demonstrated as a commercial model in a standard package, integrated with our modularization expertise, Samsung Engineering can evolve into a total solution provider, extending beyond its previous role as a former EPC contractor.

Stand: 9420
Hall: 9

www.samsungengineering.com



Through flagship projects that are developed and executed, Samsung Engineering will demonstrate how we are implementing our decarbonization strategies. Project Shepherd represents a significant business value chain model, encompassing carbon capture and CO2 storage that spans national borders. Working alongside Korean private sectors and Malaysia Sarawak Economic Development Corporation Energy, Samsung Engineering is advancing the clean hydrogen development project. Upon completion, green hydrogen and green ammonia will be produced in Sarawak, Malaysia.

We will lead the entire project cycle, covering direct investment, construction, transportation and utilization. This project will serve as an exemplary model that enhances the global recognition for renewable energy trade and hydrogen transportation between Korea and Malaysia, while also driving the development of hydrogen-related standards in both countries.

Once again, these flagship projects will illustrate Samsung Engineering's vision of actively shaping our future decarbonization value.

How will you be promoting your decarbonisation efforts at ADIPEC 2023?

Samsung Engineering will be an active participant in ADIPEC 2023, spanning the entire four-day schedule. First of all, we will set up a dedicated exhibition space within our booth, aligned with this year's ADIPEC theme, 'Decarbonising. Faster. Together'. Within this segment, we will introduce a selection of flagship projects developed by Samsung Engineering for the decarbonization. Additionally, we will highlight innovative energy transition technologies developed by the

companies we invested in and collaborated with for green solutions. The introduction will feature these three companies, along with concise description of their core technologies in the carbon capture sector and hydrogen production from waste gas. Visitors will have access to technical information through visualized mock-up models. Once they select specific options on our kiosk, they can see the further details on each chosen keyword via video or written descriptions.

In addition, on the second day of the event, Samsung Engineering has planned a joint presentation session. We will extend invitations to the ventures we have invested in, and an executive from Samsung Engineering will provide an overview of our green solution strategy while executives from these three companies also join the session.

The presentation is expected to last about an hour, during which each company's technical capabilities and collaboration plan with Samsung Engineering will be unveiled. Following the session, we will provide an overview of the Green Solution Flagship projects currently under development by Samsung Engineering. These flagship projects encompass CCUS and green hydrogen/ammonia production.

Samsung Engineering's Presentation Program:

2nd Oct'23 :

-13:30 ~ 14:30 pm - Smart Safety and Quality Platform
-14:30 ~ 15:00 pm - Project Delivery Solution
-15:00 ~ 15:30 pm - ECO Solution Provider for Circular Economy

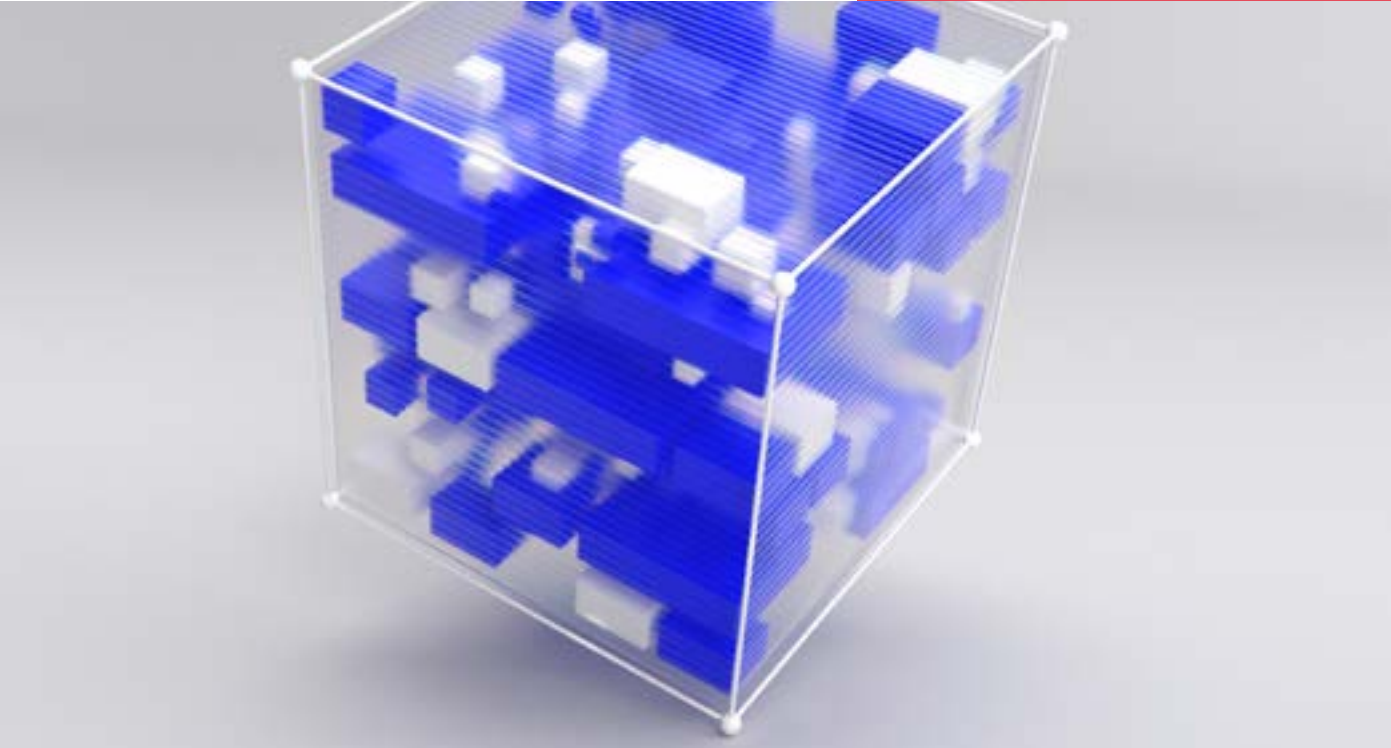
3rd Oct'23:

-13:30 ~ 14:30 pm - Sustainable Technology Solution
-14:30 ~ 15:00 pm - Sustainable Project Development (Flagship PJT)
-15:00 ~ 15:30 pm - Smart Safety Platform (Arabic)

ENERGY STORAGE



Stand: 4330
Hall: 4
-
www.slb.com



Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions

Energy Storage Secure access to energy when needed is imperative as energy demand increases. And reliable systems to store and distribute energy are critical to building a balanced energy future we can count on. Renewable energy sources like solar and wind power hold great potential for a sustainable future, but their intermittent nature poses a significant challenge for grid flexibility. Stationary energy storage technologies are key to absorb and manage fluctuations in supply and demand—and battery energy storage systems (BESS) are one of the most adaptable and on-demand solutions. Energy storage systems can store energy in times of oversupply and use it during demand peaks or in periods with little or no renewable energy generation, ensuring a reliable and continuous supply of electricity. Backed up by long-standing technology industrialization leadership, digital systems, remote operations safety standards, and operational performance, SLB integrated stationary energy storage solution that can be deployed globally. An innovative solution based on nickel-hydrogen battery technology used by NASA for more than 30 years, was refined by researchers at Stanford University to enhance performance and reduce cost. This disruptive technology, developed by our partner EnerVenue, creates an innovative battery storage solution deployed by SLB with an optimized system design, integration, and deployment to your energy storage needs.

How does your decarbonisation-related product, process or solution benefit the industry or users?

The SLB battery energy storage technology provides the most durable energy storage system for commercial, industrial, and grid-scale applications. It's 30-year lifespan, 30,000 cycles, and ability to cycle 3 times per day with no degradation, is changing the narrative in the energy storage space. Furthermore, the solution is safe, with no fire or thermal runaway risk; it is flexible as it has a discharge duration that ranges from 2 to 12 hours; and it is sustainable, as it is 99% recyclable at end of life. The technology can also operate in a wide range of temperatures, ranging from -10 degC to 45 degC, with no need of HVAC.

Please provide any examples of how your decarbonisation-related product, process or solution has been used in the field and what sort of impact it has or can have.

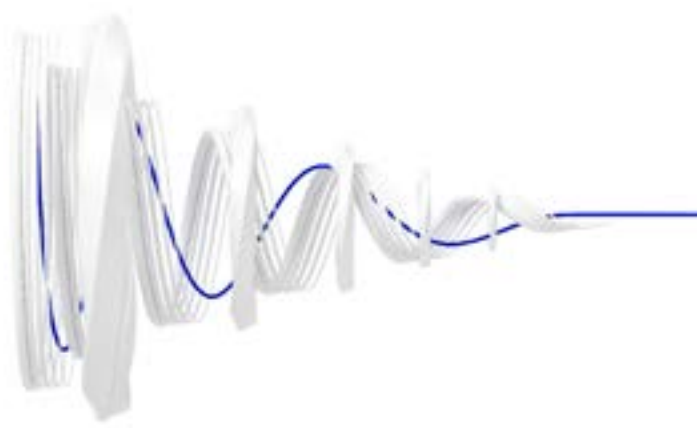
Provide reliability for grid stabilization and flexibility.

How will you be promoting your decarbonisation efforts at ADIPEC 2023?

Come visit us on our Booth for more details.

TRANSITION TECHNOLOGIES

Transition Technologies: EcoShield and Aqueous Fluids Solutions The SLB Transition Technologies™ portfolio includes proven technologies that drive high performance while reducing CO2 emissions. Using a scientific methodology developed by our engineers, the impacts of these technologies have proved to reduce footprint now. Our method categorizes the environmental attributes of these Transition Technologies and links them to universally recognized United Nations Sustainable Development Goals (SDGs). Another solution in our Transition Technologies portfolio includes our Aqueous Fluid Solutions. Operators are moving toward water-based fluids for their operations to comply with sustainability requirements. In anticipation, we have developed the most complete portfolio of Aqueous Fluid Solutions that not only deliver sustainability with competitive performance in drilling and reservoir drill-in fluids (RDFs), but also advanced digital management and automation, along with sustainability tools that help quantify reduced emissions through the entire fluids management life cycle. So, you maintain your performance edge while lowering total cost of ownership and sustainability footprint. These fluids help keep operations above water by lowering logistical costs, eliminating transport of base oil or cuttings, and minimizing the costs associated with lost circulation.



How does your decarbonisation-related product, process or solution benefit the industry or users?

EcoShield™ geopolymer cement-free system is one solution that will continue the decarbonization of the oil and gas industry. Cement manufacturing accounts for more than 5% of the global anthropogenic CO2 emissions. Decarbonizing the well construction process, while adhering to safety and performance standards, is critical to our industry's pathway to net zero. EcoShield system delivers industry-standard zonal isolation capabilities while significantly minimizing impact from upstream oil and gas production.

Please provide any examples of how your decarbonisation-related product, process or solution has been used in the field and what sort of impact it has or can have.

By cementing wells without cement, EcoShield system has the potential to avoid up to 5 million metric tons of CO2 emissions annually—the equivalent of removing 1.1 million cars from the road each year.

How will you be promoting your decarbonisation efforts at ADIPEC 2023?

Stop by and see us in Booth #4330 to learn more about how our Transition Technologies can help you achieve your sustainability goals.

GEO THERMAL

With minimal greenhouse gas emissions and the ability to provide locally sourced “baseload power,” geothermal energy provides a clean and reliable energy source. Conventionally sourced geothermal power generates about 16,000 kW of energy today. However, there is potential for additional development propelled by technology and expertise focusing on addressing the industry challenges to scale including reducing exploration risk, lowering drilling costs, and improving resource sustainability. With 50 years of offering leading expertise in geothermal consulting in over 300 of the world’s geothermal projects, SLB is leveraging this knowledge to enhance its software for the unique needs of geothermal subsurface characterization, resource assessments, numerical simulations, and more. SLB offers GeothermEx consulting services—advanced digital, exploration, drilling, and production technologies to overcome the specific challenges of the geothermal industry. For example, harder rock and higher temperatures led to the development of drillbit technologies, such as Xplorer Kaldera™ high-temperature seals for roller cone bits, and the ThermoBlade™ thermal-resistant diamond element bit. Both integrate advanced materials and specialized components to deliver longer bit runs with improved reliability. Another example is that high-enthalpy geothermal wells that reliably deliver high fluid flow rates led to the development of the Reda Thermal™ power-efficient geothermal electric submersible pump. Together, these efforts reduce initial exploration risks and the costs of development for geothermal project developers and financiers, enabling more projects to reach FID. In five decades, we’ve enabled development of 8.5 GW of power, derisking investments of more than USD 14 billion for conventional geothermal projects. Now, as the world pivots to cleaner energies, we are at the forefront of ground-breaking geothermal pursuits. From countrywide geothermal potential evaluation, to providing advanced technologies to improve operational performance, SLB applies its legacy of geothermal-specific expertise to its consulting services and technologies to advance geothermal projects across the world.

How does your decarbonisation-related product, process or solution benefit the industry or users?

SLB’s portfolio of solutions and services help make geothermal energy more accessible, less risky, and more cost-effective for developers and financiers, thereby improving the chances of projects to pass FID and move into full development and production. Our products and services may help revitalize or remediate existing geothermal wells to improve flow rates, increase wattage generated or manage the long-term sustainability of the source. As a result, the end consumer receives clean, baseload power or electricity with minimal to no CO2 emissions.

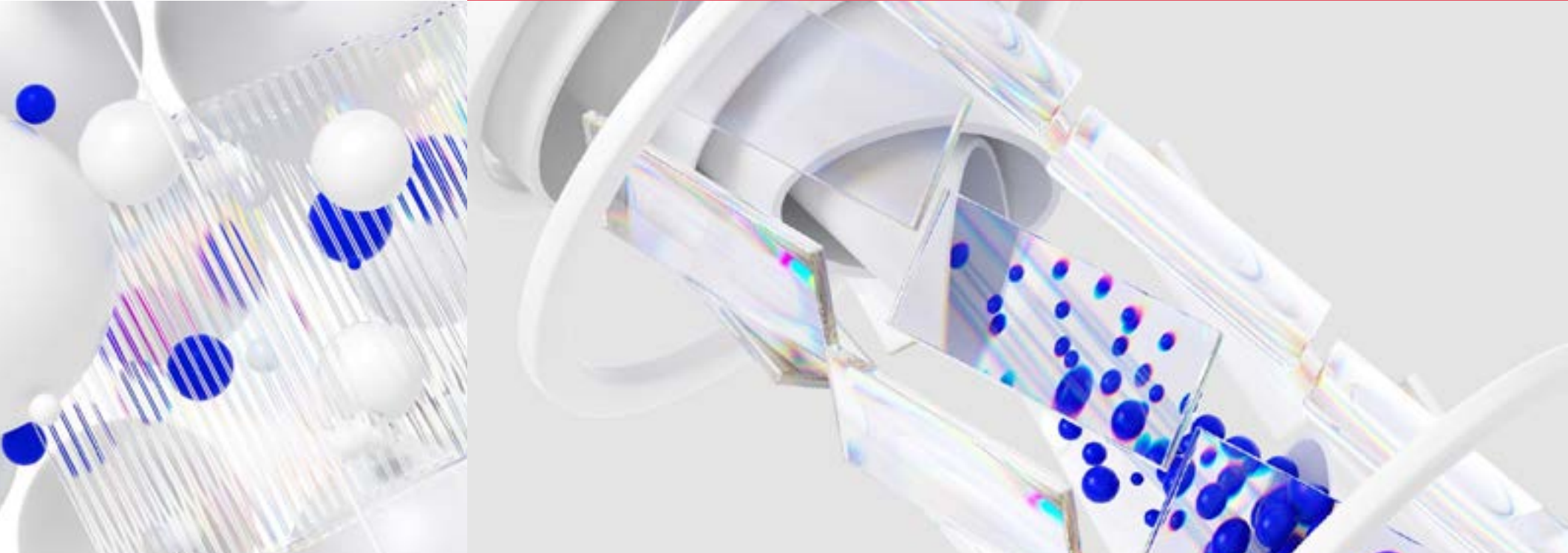
Please provide any examples of how your decarbonisation-related product, process or solution has been used in the field and what sort of impact it has or can have.

- SLB has provided exploration, drilling, feasibility studies, and operations for four production and three injection wells as a geothermal project in Turkey
- SLB is collaborating with Oman’s Ministry of Energy and Minerals and the Oman Investment Authority to build a national strategy that develops the potential of Oman’s geothermal resources.
- SLB has provided fracture characterization and numerical simulation studies at the United States Department of Energy’s Utah FORGE’s site, where the feasibility of EGS technologies and methodologies are being tested.

How will you be promoting your decarbonisation efforts at ADIPEC 2023?

SLB will be presenting the geothermal offerings at our booth.

CCUS



Stand: 4330
Hall: 4
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www.slb.com

How does your decarbonisation-related product, process or solution benefit the industry or users?

With the increasing regulatory push towards decarbonization and the tightening of emission standards, the feasibility of geological storage sites becomes crucial. Emitters and pore-space owners require expertise in identifying sites with optimal characteristics such as permeability, porosity, and geological stability, alongside assessing the potential storage capacity, safety parameters, and regulatory compliance. The market is also driven by the need to minimize operational costs and environmental impact by selecting sites in proximity to CO2 sources and with readily available infrastructure. This confluence of factors makes SLB’s Carbon Storage Site Screening and Ranking and Carbon Storage Evaluation solutions crucial components in the fight against climate change. SLB’s Carbon Storage Site Screening and Ranking and Carbon Storage Evaluation solutions help provide a consistent methodology leveraging industry-leading solutions to quickly and cost-effectively screen, rank, and evaluate potential storage sites. Whether a client is an oil and gas company considering the development of its depleted fields or saline aquifers as potential storage sites, or an emitter looking at the potential for CO2 storage under their property, SLB leverages its decades of experience in the subsurface to assess a site’s potential performance as well as any health, safety or environmental risks.

Please provide any examples of how your decarbonisation-related product, process or solution has been used in the field and what sort of impact it has or can have.

- At the Northern Lights project in Norway, the Delfi™ digital platform was used to collaborate on innovative digital solutions across the

CCUS value chain and optimize the CO2 storage capacity evaluation process.

- At the Illinois Basin ADM Site, SLB was an operational partner for site characterization, modelling, and project management. The project is now more than 10-years old and monitoring of the plume continues to track the CO2 containment.
- At Project Tundra in North Dakota, SLB performed data analysis and reservoir modeling using advanced integrated reservoir performance technologies and developed a workflow for understanding of injection well behavior.
- At a post combustion capture facility in Canada, which was the first integrated commercial CCUS facility of a saline aquifer in Canada, SLB provided seismic acquisition, subsurface characterization, well design, injection operations, and MMV services.

How will you be promoting your decarbonisation efforts at ADIPEC 2023?

Fred Majkut, senior vice-president of Carbon Solutions will be speaking on the following panel as part of the Hydrogen Strategic Conference “Blue hydrogen: unblocking progress with CCUS on the journey to net zero”. At SLB booth following the panel participation, we will have a booth event for the introduction of the new Carbon Storage Solutions.

METHANE EMISSIONS

Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions

SLB’s Methane Emissions Elimination – 2nd Generation Point Sensor SLB will launch our next-generation methane point instrument at ADIPEC 2023, a rapid evolution from its predecessor. With its size reduced to a tenth of the original, enhanced ruggedness, and plug-and-play functionality, this instrument revolutionizes methane monitoring. Designed for affordable, small-scale or fast large-scale deployment, its ease of use empowers field staff to install it quickly and easily without specialized training or tools, fostering rapid deployment and cost savings. The instrument’s impact is substantial, enabling mass methane monitoring essential for mitigating direct emissions from oil & gas operations and curbing global warming. Comparable to self-installed home security systems, customers can conveniently set it up upon delivery, reducing complexity and costs. Key features: - Next-generation continuous methane measurement technology for enhanced monitoring - Small, self-sufficient, and plug-and-play design, suitable for various scales and operational scenarios - Integrates innovative technology for cost-effective deployment, - Supports OGMP (O&G Methane Partnership) level 5 standards.

How does your decarbonisation-related product, process or solution benefit the industry or users?

Addressing the pressing issue of direct methane emissions, equivalent in impact to an entire continent’s contribution to global warming, the instrument holds the potential to significantly contribute to climate change mitigation. Designed for rapid methane monitoring scale-up, it empowers operators to adopt and seamlessly implement monitoring strategies.

Please provide any examples of how your decarbonisation-related product, process or solution has been used in the field and what sort of impact it has or can have.

Our next-generation methane point instrument marks a transformative step in methane monitoring. Its compactness, user-friendliness, and technological alignment position it as an invaluable tool for operators aiming to mitigate emissions, conform to regulatory standards, and drive sustainability in the oil & gas sector.

How will you be promoting your decarbonisation efforts at ADIPEC 2023?

Join us at ADIPEC 2023 Booth 4330 to learn more about how you can detect and eliminate methane emissions in your operations.

DECARBONIZING ONSHORE DRILLING, COMPLETION, AND PRODUCTION ACTIVITIES WITH TECHNIPFMC'S E-MISSION™ THERMAL APPLICATION

Decarbonizing the onshore production process of traditional energy sources is an important step towards reducing greenhouse gas (GHG) emissions. One key contributor is the flaring of excess methane, so by reducing this in existing and new facilities' design, operators can take a significant step in cutting emissions and increasing production efficiency. As part of TechnipFMC's focus on decreasing carbon intensity, the company has developed and implemented the e-Mission™ Thermal app to optimize asset performance and improve operational efficiencies.

A holistic, automated solution, e-Mission™ uses artificial intelligence and machine learning to recognize and anticipate each well's unique patterns of production. Installed on new or existing drilling, completion, and production facilities, it uses real-time actionable data and insights to automate optimization. Its sensors track every stage of the process, from wellhead through to flare and export line.

Its impact is immediate. In just three months at one site in the U.S Permian Basin, e-Mission™ slashed routine facility emissions by 47 percent and burner emissions by 96 percent. During another six-month trial, one customer cut CO2 equivalent emissions by 2,240 metric tons – the same amount generated by driving 5.6 million miles in an average U.S. automobile. Gas that would have been flared was instead exported as sellable oil.

Put simply, e-Mission™ reduces carbon intensity and increases production by carefully managing temperature and pressure in real-time. The technology is not limited to new well sites as it can be quickly retrofitted to existing onshore equipment to deliver rapid results.

How is this achievable? Through TechnipFMC's focus on technology, integration, and automation.

e-Mission™ uses differentiated core technologies that enable integrated solutions to leverage the benefits of smarter designs. Its pre-engineered, modular components bring down engineering, time, and cost. And intelligent products are remotely managed using actionable data – reducing manpower in the field, maximizing uptime, and enabling enhanced production.

The suite combines information that many brownfield sites already measure – such as data about temperatures, pressures, etc – with our algorithms to determine where to optimize systems to slash flaring. e-Mission™ evaluates the data fed back from the field and uses automation to remotely adjust the system parameters to ensure operators get the best value and environmental outcomes. This real-time feedback loop gives operators the ability to consistently integrate data so they can identify issues early, quantify actual emission events, and leverage advanced analytics to prevent future emission events. Data is used to identify process changes that lead to systematic intermittent interventions, as well as visualize events in real time and provide alarm notification based on the event's significance. e-Mission™'s simple dashboard visualizes historical and real time events, identifying probable sources and causes. It also generates regulatory reporting.

e-Mission™ is the only solution with the ability to monitor and calibrate controls to reduce flaring in real time. Many operators have focused first on identifying the causes of emissions in their drilling, completion, and production activities then monitoring for trends to establish an elimination plan. e-Mission™ provides the needed next step: the ability to make immediate adjustments in their production system to reduce gas and flaring in the process.



**Stand: 4420
Hall: 4**

www.technipfmc.com



The system requires no additional instrumentation or equipment and can be implemented in a matter of hours. We collaborate to understand each customer's needs for each individual site, then quickly and easily implement e-Mission™. Customers don't have to change their operating procedures – it runs seamlessly behind the scenes.

The e-Mission™ Thermal app also has safety benefits. Employees are out of the red zone but still in full control of the well site. e-Mission™ utilizes our User-Configurable Open System (UCOS) control system as its base, with all the alarms and shutdown signals of a typical control system embedded there. Control resides in our Edge computing system, on a physical unit out in the field, so any interruptions in telecommunications connectivity won't affect operations, and automated shutdowns to ensure the site remains safe. The systems are linked to the cloud. Our InsiteX app gives TechnipFMC and the operator real-time visibility of every parameter.

Energy companies worldwide are making ESG and emissions commitments and having a technology they can retrofit to existing equipment to help achieve that is an impactful benefit.

TENARIS'S COMMITMENT FOR A SUSTAINABLE FUTURE IN ENERGY

The world's energy future is being shaped by the dual challenge of climate change and the rising demand for energy. Tenaris, as a leading global manufacturer and supplier of steel pipes and services for the global energy industry and other industrial applications, is committed to playing its part by reducing the environmental footprint of its operations and by developing new technologies for the next generation of energy.

The company has pledged to achieve a 30% reduction in its CO2 emissions intensity rate by 2030 considering scopes 1, 2, and 3, compared with 2018 levels. This medium-term target forms part of a broader long-term objective of achieving carbon neutrality. Tenaris aims to achieve this target by using a higher proportion of recycled steel scrap in the metallic mix, investments to increase energy efficiency, and the use of renewables for part of their energy requirements. As a significant step in this direction, Tenaris invested approximately \$200 million the construction of a wind farm located in the province of Buenos Aires, Argentina. The wind park, expected to be operative by end of October 2023, would supply close to 50 percent of Tenaris's electricity requirements for its Siderca mill in Argentina, reducing CO2 emissions by 152,000 t/yr.

On the product development front, Tenaris has been consolidating its technical expertise over the years to develop key competences and the technologies required to ensure reliable solutions to support the deployment of low carbon energy applications. By leveraging on its technological capabilities and drive for innovation, Tenaris can support the energy transition with an advanced portfolio of solutions for hydrogen storage and transportation, Carbon Capture and Storage (CCS), and geothermal installations.

CCS is a segment that will have relevant impact in the coming years. Tenaris is placing its experience in developing knowledge and trialing new technologies at the service of Carbon Capture and Storage developments, actively collaborating with public and private entities and operators to find new ways to address these challenges and ensure the safe and efficient development of CCS projects.

Low temperatures and corrosion are the main technical challenges affecting CO2 transportation and storage. Tenaris has run full-scale testing for TenarisHydril Blue® premium connections with Dopeless® technology at temperatures near -80°C, to prove its gas sealability performance at extremely low potential operating temperatures. Leveraging decades of testing and successful use in oil and gas wells, and experience in pioneering CCUS projects, TenarisHydril premium connections are an optimal solution to be applied in CO2 injection wells, while Tenaris's expertise working in corrosive conditions will ensure reliable products for offshore and onshore transportation for CO2 use and sequestration.

As the relevance of hydrogen continues to grow in the world's pathway to a net-zero future, back in 2021 Tenaris launched THera™ - Tenaris Hydrogen era - its proprietary materials technology for hydrogen applications. These include hydrogen storage systems for refueling stations designed for pressures from 240 bar up to 1000 bar; tube trailers with customized dimensions and lengths to optimize the hydrogen transport design; onshore and offshore pipelines to safely transport up to 100% hydrogen, and a range of solutions for industrial segments such as refineries, hydrocarbons, and green/blue hydrogen processing.

Tenaris has recently expanded its portfolio of THera™ products with a hydrogen linear storage solution, offering enhanced storage capacity, ranging from 5 to 100 tons. A thorough R&D process and the collaboration of different players contributed to having achieved a high-quality technical solution with enhanced fatigue life resistance that is also safe and economically viable.



**Stand: 7130
Hall: 7**

www.tenaris.com

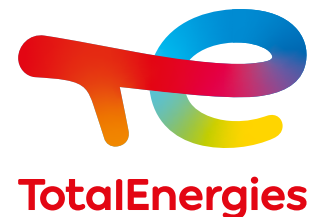


With more than 30 years of experience in supplying casing for specific geothermal drilling challenges, Tenaris has been increasing its focus on geothermal applications, partnering in geothermal activities for power production as well as for direct use and thermal spa.

Renewed interest in establishing geothermal as a secure, CO2 free energy source has driven the exploration of geothermal wells towards more complex environments. Geothermal and oil and gas wells have similar features and often face critical issues such as corrosive environments, high temperatures and material selection.

Tenaris's product portfolio has been fine-tuned to optimize well design and productivity for both complex oil and gas wells and geothermal environments.

For more information, visit www.tenaris.com



Our Actions to Reduce Indirect Emissions, Together with Society

Accelerating to a 25% reduction in the carbon intensity of our sales by 2030

The lifecycle carbon intensity of energy products sold divides emissions over a product's lifecycle by the total quantity of energy sold¹.

The indicator accounts for the impact of our multi-energy transformation and our investments in low-carbon energies. Thus, it reflects our progress in decarbonizing the energy mix of our sales and helping our customers reduce their emissions.

In 2022 we maintained our progress by notching a 12% reduction in the lifecycle carbon intensity of our products since 2015, thanks to growth in our sales of LNG (up 15% in 2022 over the previous year) and electricity (3%) and the diminishing share of our sales

from petroleum products (41% of our sales mix in 2022, compared to 44% in 2021).

Based on our progress in 2022, we have decided to raise our objectives and are now aiming to reduce carbon intensity by more than 15% in 2025 and 25% in 2030, instead of the 10% and 20% targets that we had previously set.

-25%

in 2030. Our new target reduction in lifecycle carbon intensity of energy products sold.

Stand: A232
Hall: Atrium

www.totalenergies.com

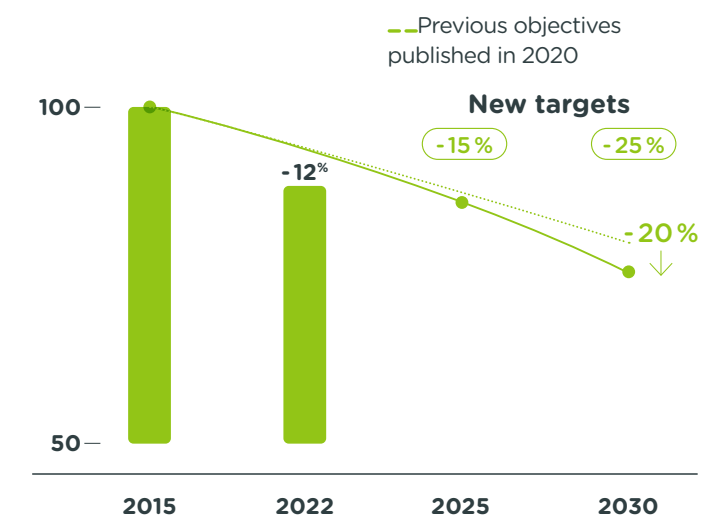
Growth in electricity will drive more than half the reduction in our lifecycle carbon intensity between 2015 and 2030. Another factor will be reduced sales of petroleum products coupled with an increase in gas (and specifically LNG) production and sales of products derived from biomass. Lastly, carbon sinks and lower emissions from our facilities will each account for about 5% of the reduction in carbon intensity.

TotalEnergies is positioning itself for the world's future energy supply and fulfilling its ambition of being a major force in the energy transition. ■

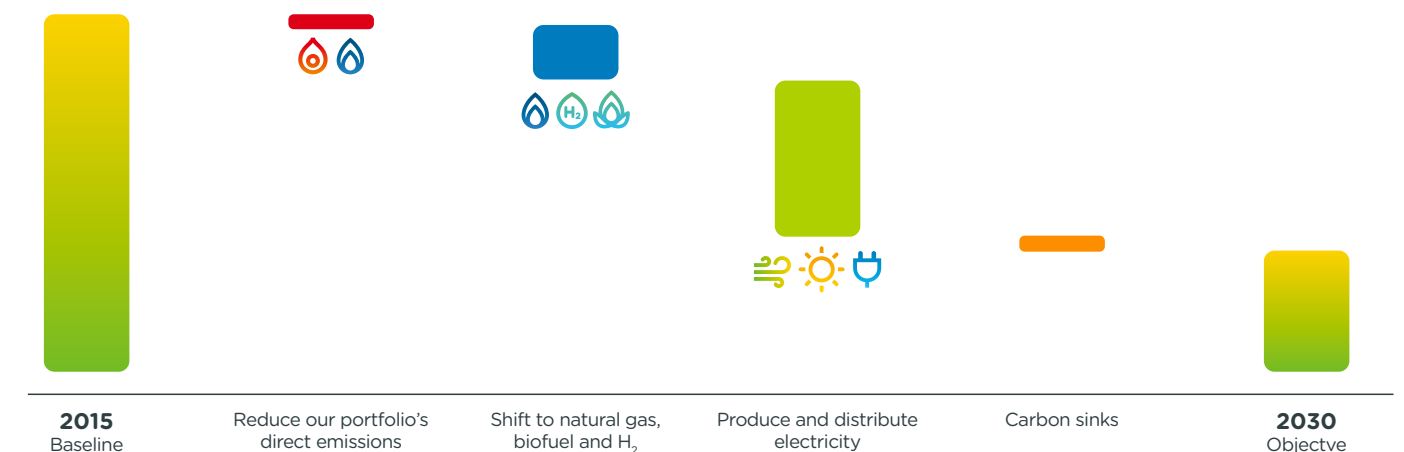
1. The indicator is calculated by dividing numerator and/or denominator (see p. 106 for more details).

NET LIFE CYCLE CARBON INTENSITY OF SOLD PRODUCTS

Base 100 in 2015



LEVERS TO CARBON INTENSITY REDUCTION (2015-2030)



CCS AND HYDROGEN FOR A NET ZERO FUTURE

Mitigating climate change is one of the biggest challenges the world is facing today. German-based gas and oil producer Wintershall Dea is part of the solution and contributes its long-term E&P competencies as well as assets to provide large-scale decarbonisation solutions to Europe's industries.

Wintershall Dea explores for and produces gas and oil in 11 countries worldwide and is on its way to become one of the leading gas and carbon management companies in Europe. The company supports the EU's 2050 carbon neutrality target and plans to reduce emissions by deploying carbon capture and storage (CCS) and low-carbon hydrogen technologies. With its Carbon Management and Hydrogen strategy, initially focused on Northwestern Europe, Wintershall Dea aims to develop a portfolio of projects that can tackle 20 to 30 million tonnes of CO₂ per year by 2040. This corresponds to almost 60% of the total emissions of the German steel industry.

With the two projects **BlueHyNow** and **CO₂nnectNow**, Wintershall Dea contributes to the ENERGY HUB Wilhelmshaven, the new centre for Germany's climate-friendly energy supply on the German North Sea coast. BlueHyNow is to be developed on site of the company's partner Nord-West-Oelleitung and benefits from existing energy infrastructure. The future plant aims to produce up to 5.6 TWh of blue hydrogen per year, using Norwegian natural gas and green wind power from the North Sea. CO₂nnectNow is planned to become a logistical hub for CO₂, where emissions from German industrial sites are collected and transported to storage sites in the North Sea for safe and permanent underground storage.

The Norwegian Continental Shelf plays a key role in Wintershall Dea's carbon management portfolio since it provides highly suitable CO₂ storage conditions. The company is increasingly investing in CCS technology and leverages on strong support by the Norwegian government. Together with partner Equinor, Wintershall Dea wants to support the construction of the **NOR-GE pipeline** that connects continental European industry clusters and suitable storage sites in the North Sea. The flagship project is intended to lay the foundation for a complete value chain that enables the safe transport, injection, and storage of CO₂ emissions below the Norwegian North Sea. The pipeline is planned to transport industrial CO₂ emissions, for instance, to the Luna and Havstjerne licences, for which Wintershall Dea will be the operator. The Luna licence is located 120 km west of Bergen and is estimated to hold an injection capacity of up to 5 million tonnes CO₂ per year. The **Havstjerne** licence is located 135 km southwest of Stavanger with an estimated storage capacity of around 7 million tonnes of CO₂ per year.

Being one of the leading members of the **Greensand** consortium, the company is also involved in one of the most advanced CCS projects in Europe. In March 2023, together with partner INEOS, Wintershall Dea successfully demonstrated the first full cross-border CCS value chain in Europe. For the pilot injection, first quantities of CO₂ from a Belgian emitter were safely stored in the depleted Nini West oil field in the Danish North Sea. In Greensand, up to 1.5 million tonnes of CO₂ could be stored per year by 2026, and up to 8 million tonnes by 2030. This is more than 13% of Denmark's entire annual emissions.

Additionally, the company has joined a consortium whose members have signed an agreement to jointly mature and pursue the "**Greenport Scandinavia**" project. A CO₂ hub near Hirtshals on the Danish North Sea coast is designed to serve as a collection point for CO₂ initially generated by the production of biogas in regional plants. It could later be connected to the Greensand value chain. Approximately 1.5 million tonnes of CO₂, some of which will come from countries along the Baltic Sea, are planned to be sequestered each year in this way. In August 2023, Wintershall Dea entered the British CCS market and was awarded the Camelot licence with an annual storage potential of up to 6 million tonnes of CO₂.



wintershall dea

Stand: 6350
Hall: 6

www.wintershallda.com



With a total of four licences in three North Sea countries, Wintershall Dea reaffirms its ambitions to become a leading gas & carbon management company and to deliver solutions to tackle climate change and decarbonise industries.

To learn more you can visit Wintershall Dea stand at ADIPEC in Hall 6 (6350) and company's website <https://wintershallda.com/en/who-we-are/ccs-and-hydrogen>.

On 2 October, Margarethe Kleczar, VP Carbon Management and Hydrogen at Wintershall Dea, will participate in the panel discussion 'Promoting cutting-edge carbon capture technologies' in Decarbonisation Theatre of ADIPEC's Decarbonisation Zone (3:00-3:45 PM, Hall 12).

On 3 October, Hugo Dijkgraaf, CTO of Wintershall Dea, will join the strategic panel "DAC and CCUS as enablers of carbon neutrality" in Decarbonisation Theatre of ADIPEC's Decarbonisation Zone (10:00-11:00 AM, Hall 12).

Don't miss the FluidFlower Live Injection at Wintershall Dea stand on 2,3 and 4 October at 12:30 PM.

DOWNLOAD THE ADIPEC MOBILE APP

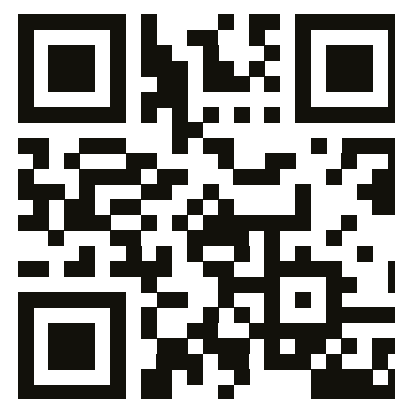
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A SELECTION OF DECARBONISATION SOLUTIONS FROM ADIPEC 2,200 EXHIBITORS



Stand: 8539
Hall: 8
www.abl-group.com



Stand: 3157
Hall: 3

Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions

ABL brings together multi-disciplinary engineering expertise with practical experience across our market sectors, and in-depth knowledge of renewable energy and transition technology solutions, to provide a comprehensive range of advisory, engineering, design and consulting services across 7 core pillars of energy transition: electrification, emissions, hydrogen, battery energy storage (BESS), clean shipping, climate change analysis and adaptation, carbon capture storage and utilisation (CCUS).

How does your decarbonisation-related product, process or solution benefit the industry or users?

We have a wide portfolio of projects having supported in the following: - 30+ hydrogen projects - 5+ GW of battery energy storage solutions (BESS) - 70+ Floating solar PV - Design of Europe's 1st 0-emissions hydrogen fuel cell powered car and passenger ferry - Digital portal to assess, audit and abate emissions from port infrastructure - Assessment, design and engineering of shore power solutions via renewable energy hybridisation & battery energy storage solutions (BESS) - +10 CCUS projects delivered.

Please provide any examples of how your decarbonisation-related product, process or solution has been used in the field and what sort of impact it has or can have.

Our emiTr emissions tracking portal for ports is currently used for Shoreham Port in the UK. We have also brought together our cross-section of expertise to advise in a number of power to x projects such as NEOM.

How will you be promoting your decarbonisation efforts at ADIPEC 2023?

ABL's stand is within the UK Pavilion in Hall 8 and will also be showcasing a video on our comprehensive through-life support in driving optimisation and sustainability across well operations.

Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions

Acme manufactures High Voltage Electrode Boilers in hot water and steam versions for capacities up to 60MW and supply voltages to 25KV. These boilers are zero-emission and can replace conventional oil and gas-fired boilers in environments where policies and energy pricing promote the use of clean electricity for high volume hot water and steam production.

How does your decarbonisation-related product, process or solution benefit the industry or users?

For users who want to endorse a Green policy for their manufacturing facilities, reducing carbon emissions from the boiler plant is one of the easiest targets for major reductions. These boilers make that possible.

Please provide any examples of how your decarbonisation-related product, process or solution has been used in the field and what sort of impact it has or can have.

A university boiler plant in Atlanta removed two old gas-fired boilers and replaced them with one 12MW Electrode Steam Boiler fed by a 20KV line. These boilers are nearly 99% efficient and can track demand perfectly with no lead or lag effect as is common with gas-fired boilers.

How will you be promoting your decarbonisation efforts at ADIPEC 2023?

We will have a video running explaining how the electrode boiler operates as well as experienced engineering personnel to discuss potential applications with visitors.



Stand: 14458
Hall: 14

Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions

Aeromon monitors a wide range of airborne emissions, including gas components, particulates and noise. We started by measuring the gas components produced by combustion processes. We have since expanded to include the study of malodorous and greenhouse gases. Traditional compounds regulated and monitored include sulphur dioxide (SO₂) and nitrogen oxides (NO_x), which cause land and water to become acidic, as well as ammonia (NH₃), which is toxic and can simultaneously lead to acidification and eutrophication of the soil. The need to slow global warming has expanded client interests beyond the regulatory minimum of monitoring: all relevant greenhouse gas (GHG) compounds – carbon dioxide (CO₂), methane (CH₄) and nitrous oxide (N₂O) – are being monitored and controlled. The focus is already on CO₂ and CH₄, and now eyes are turning toward N₂O because of its significantly higher greenhouse gas potency. Largely, the VOC emissions come from unburned fuel residues and chemical solvents. Many VOC emissions are harmless, but others are highly dangerous. VOCs contribute to smog by forming ground-level ozone upon reaction with nitrogen oxides in sunlight. They can also threaten groundwater quality.

Please provide any examples of how your decarbonisation-related product, process or solution has been used in the field and what sort of impact it has or can have.

Analysing the results requires complex data aggregation New gaseous compounds can be monitored continuously as Aeromon has the capability to rapidly integrate new sensors into its measuring platform as required. We have built a generic interface where different sensors are combined. A key part of our work is analysing the received data. By comparing results from different sensors, Aeromon's tailored algorithms accurately determine the presence of the compound of interest. Our mission is to be at the forefront towards cleaner and healthier air, making a lasting impact on environmental preservation.

How will you be promoting your decarbonisation efforts at ADIPEC 2023?

Daily Live Demonstration at our booth.



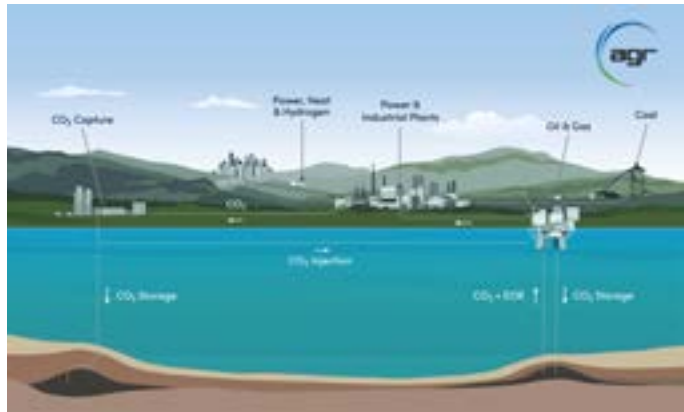
Stand: 13498
Hall: 13 German Pavilion
www.aerzen.com

We manufacture hydrogen compressor towards green Energy. Using Hydrogen as fuel, zero CO2 emission.

Superlative hydrogen compression:
higher differential pressure with only one stage.

New oil-free screw compressor from AERZEN for efficient compression of **electrolysis hydrogen**. With the Model VRW536M, AERZEN is further expanding its portfolio of screw compressors for hydrogen compression. The design and water injection of the innovative compressor stage allow the highest differential pressure to date in a single-stage oil-free screw compressor in the competitive environment. The result: minimal footprint and significantly reduced investment and operating costs. Bringing large H₂ volume flows to intermediate and final pressures with fewer compressor stages without having to set up largest reciprocating compressor systems - this is exactly where the new oil-free VRW536M screw compressor from AERZEN comes in. Compression is based on the principle of oil-flooded screw compressors - with a small but subtle difference: the oil was replaced by water. The water serves both to cool the gas and to seal the internal gaps, enabling compression to higher differential pressures with highest efficiency. This stage can, thus, replace a two-stage system with classic dry screw compressors and is even more energy-efficient. For the customer, this results in significant advantages in terms of installation space as well as investment and operating costs.

During ADIPEC we will have supporting literature, demonstrations and our product leads will be present to speak with you and answer any questions, you can find us at Stand 13498, Hall 13 German Pavilion



Stand: 8539
Hall: 8 UK Pavilion



Stand:13110
Hall: 13
www.airpack.nl

Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions

Balancing increasing energy demand while lowering greenhouse gas (GHG) emissions is one of the greatest conundrums facing the industry today: global consumption is currently around 100 million B/D. Re-purposing oil and gas facilities and skills for Carbon Storage and carbon Use delivers instant effects in climate change emergency. Ageing production facilities and subsurface installations possess inherent qualities that make them well-suited for CO2 injection. One of the key advantages is the presence of drilled wells and knowledge about what's under the surface. This provides access to subsurface formations suitable for carbon storage thereby utilizing the subsurface storage capacity that already exists. This approach may also offer a time and cost-effective and expedited solution compared to constructing entirely new storage sites.

How does your decarbonisation-related product, process or solution benefit the industry or users?

Offshore facilities are designed with stringent safety protocols and regulatory compliance in mind. The expertise and experience developed in the offshore industry over years, such as reservoir engineering, well integrity management, and monitoring techniques, directly translate to the requirements of carbon storage operations. The existing knowledge combined with re skilling of today's petroleum engineers ensures that workforce and repurposed offshore facilities maintain the highest standards of safety and operational excellence.

Please provide any examples of how your decarbonisation-related product, process or solution has been used in the field and what sort of impact it has or can have.

The safe operation of CO2 injection wells is of paramount importance. We provided Well Integrity and well control evaluation on one of the world's largest CO2 storage projects in Australia. More than 7 million tonnes to date of CO2 have been injected and more than 100 million tonnes of CO2 expected to be mitigated over the life of this CCS system.

How will you be promoting your decarbonisation efforts at ADIPEC 2023?

We will have a stand as part of the UK Pavillion where we are having presentations about CO2 storage - from reservoir and well engineering and subsurface perspective, and repurposing of skills. We will also showcase our nearly 20 years expertise in advising projects of carbon storage. We have advised nearly 50 CCS projects globally.

Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions

As a R&D division from Airpack Nederland BV, Gazpack has developed a system, the Sulaway system, that can clean oil gas by removing H2S and carbon dioxide (CO2). Nowadays the oil gas gets flared in most situations, what means a pollution of the environment. The system does not only prevent the pollution, but the system reuses all of the removed gasses as well. Thanks to an adsorption PSA system, that works with a molecular sieve, the system is able to remove and capture H2S from the oil gas. The captured H2S is then directed to a u-tube shaped converter that converts the H2S, together with heat and water, into H2SO4, better known as battery acid. The battery acid can be sold to create an extra source of income. The CO2 is separated from the remaining gas with membrane technology, the removed CO2 can be captured and liquefied to create an extra source of income. Or the CO2 can be directed back into the empty oil well. The cleaned gas, mainly methane, can be used for the production of hydrogen for example or it can be sold as biomethane (natural gas). By cleaning the oil gas Gazpack does not only prevent the pollution of the environment, but we now can use all the valuable resources..

How does your decarbonisation-related product, process or solution benefit the industry or users?

Like mentioned above, our system can separate and capture the CO2 from the gas. That CO2 can be liquified and purified so it can be sold.

Please provide any examples of how your decarbonisation-related product, process or solution has been used in the field and what sort of impact it has or can have.

The system can clean oil gas into usable gases. Nowadays, most of the oil gas is flared. Thank to our system those flares can be reduced, which will have a positive impact on the environment.

How will you be promoting your decarbonisation efforts at ADIPEC 2023?

It will be promoted at the stand of Airpack Nederland BV, we will run a presentation and short video of the system.



Stand: 4170
Hall: 4
www.alkhorayefpetroleum.com

Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions

Permanent Magnet Motors replace conventional Induction Motors used in the Electrical Submersible Pump industry, reducing electrical power consumption and reactive power towards the power grid on surface.

How does your decarbonisation-related product, process or solution benefit the industry or users?

A reduction in the electrical power consumption can be translated to a reduction in CO2 emissions in each well and a significant reduction in the lifting cost and OPEX

Please provide any examples of how your decarbonisation-related product, process or solution has been used in the field and what sort of impact it has or can have.

Permanent Magnet Motors installed in the field have shown a power consumption reduction (compared to conventional induction motors) around 10%, achieving CO2 emissions reduction (can be estimated)

How will you be promoting your decarbonisation efforts at ADIPEC 2023?

The company has thousands of ESP (Electrical Submersible Pumps) systems installed across three continents using the conventional induction motors. A step-by-step switch to the Permanent Magnet Motors technology with the cooperation of our customers (to populate ESP wells), can potentially lead to a highly significant CO2 emissions reduction around the world



Stand: 9250
Hall: 9
www.amethyste.fr

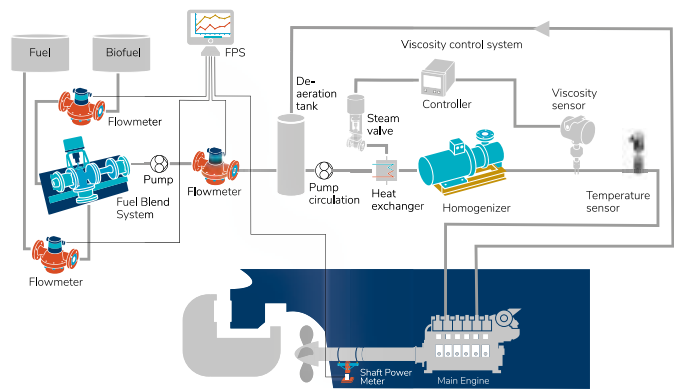
ELEMANTA-H2 is a hydrogen power barge aiming to contribute to the decarbonisation of port activities by providing zero-emission power to ships at berth or ports anchorage. The H2 power barge replaces current onboard power generation covered by auxiliary engines that mostly run on MDO.

ELEMANTA-H2 embeds key innovative technologies such as high-power fuel cell, pressurized hydrogen storage and cable management system to make it fully autonomous avoiding land requirements at berth. Thanks to a ship-to-ship connection and its frequency / voltage power output adaptability to any type of ships (containers, ferries, tankers...) this solution is highly complementary to other berth electrification assets from the grid. The Elemanta-H2 is developed based on a risk management approach through the Digital Asset Integrity Management Platform VERMARINE®, allowing safe and secure operations from design to decommissioning. Its power range is scalable, and its autonomy can be enhanced with additional storage capacity and/or introduction of liquid or solid hydrogen storage.

By using green hydrogen produced locally, the ELEMANTA-H2 participates to the development of hydrogen ecosystems. Thanks to its commissioning in two locations in Europe, the solution will be ready to be replicated and deployed at industrial scale on the world market, with a cost competitive solution compared to diesel auxiliary engines. This project also enables hydrogen technology integration in port logistics decarbonisation. The ELEMANTA-H2 reduces CO2 emissions by 85% and all NOx and SOx and PM emissions of ships auxiliary power consumption during port calls, while drastically reducing noise. ELEMANTA-H2 is therefore a key innovative solution to reach the global IMO targets to cut GhG emissions and the maritime objectives to electrify the berths by 2030.

How will you be promoting your decarbonisation efforts at ADIPEC 2023?

By showcasing the project via a video.

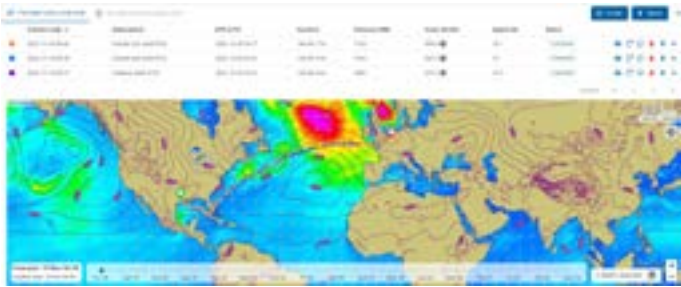




Stand: 15235
Hall: 15

Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions

GREEN SHIPPING SOLUTIONS TO REDUCE CO2 EMISSIONS
Since 1928, Aquametro Oil & Marine has been among the leading manufacturers and suppliers of measurement, optimization and monitoring solutions for all kinds of fluids on ships, vehicles and industrial applications. The use of alternative fuels plays an important role in the reduction of CO2 emissions caused by the maritime industry. Whether as an admixture to fossil fuels or as a pure alternative fuel such as carbon neutral methanol. With our solutions, it is already possible today, to add by small efforts alternative fuels to the ships which still mainly use conventional fuels such as HFO or MDO, and thus sustainably reduce CO2 emissions in shipping or in industrial applications. CONTOIL® and DOMINO® flowmeters for use with alternative marine fuels. They are available in a broad flow range. All CONTOIL® VZFA II and DOMINO® ARD are type approved by DNV. Enhanced CO2 reporting and emissions control with FPS 2.0 and SPM The Fuel Performance System FPS assists you to bundle all required data in a report on a per-voyage basis and guides you to reduce your carbon footprint. The Shaft Power Meter SPM is the key component for measuring ship performance and fuel/propulsion efficiency. It is easy to install, operates contact free and comes with DNV Type Approval. HOMOGENIZER Instability is one of the issues, users of Biofuels regularly experience. We counter this problem with our special designed HOMOGENIZERS. Resulting in smooth running engines, excellent combustion, fuel and pollution savings. Furthermore, the Homogenizer reduces sludge caused by fuel incompatibility due to different fuel specifications and comes with DNV Type Approval. Of course, our range includes many other components for the maritime industry. We will be happy to assist you in making the right decisions for a greener future in the shipping industry.





Stand: 15324
Hall: 15
www.gtt.fr

Ascenz Marorka advanced route optimisation solution is capable of advising the best route by optimising numerous parameters and respecting a large number of operational constraints such as ship dimensions, weather limitations, engine limitations, cargo types restrictions, specials areas (for regulation or safety), navigational rules.

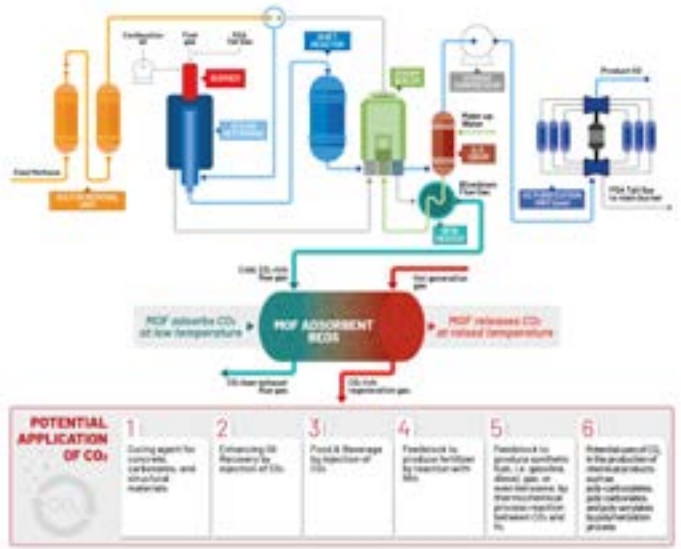
Our Weather Routing solution together with the rest of Ascenz Marorka features offer a comprehensive platform for voyage and fleet Performance optimisation.


The solution is suitable for all types of vessels and all types of propulsions and fuels. Furthermore, combined with the other features of Ascenz Marorka Platform, it offers a powerful collaborative tool for all the stakeholders to reach the organisation's operational and economic objectives such as minimizing voyage duration, voyage distance, fuel consumption, overall cost (including fuel, daily cost, canals, carbon tax...), emissions (specific to each fuel), ship motions (Parametric / Asynchronous rolling, surf-riding/ broaching-to, successive high-wave attacks...)

Depending on the optimisation criteria selected by the user, the routes can be very different. It is quite common that the savings achieved in the "lowest cost" scenario in comparison with the "shortest distance" scenario reach about 10%.

To provide the most accurate advice, the software uses the vessel's digital twin built based on the available vessel data and parameters. It takes into account the sailing conditions (e.g. draft, speed, fuel...) and the environmental conditions (e.g weather factors). This can include the vessel's dimensions, sea trials, noon reports, maintenance records, sensor data.

To deliver the best performance the algorithm favors constant power profiles. In fact, when a vessel meets adverse weather conditions, such as high significant waves, strong wind and currents, it must output more power and thus consume more fuel to maintain its speed and revolutions per minute (RPM). Further explanations and demonstrations will be showcased at Ascenz Marorka stand at ADIPEC.





Stand: 5210
Hall: Atrium
www.ascofiltri.com

Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions.

"ASCO Filtri HRR-CO2 technology is focus on the generation of "green blue hydrogen" from bio-methane or natural gas by means of high recuperative steam methane reforming and a carbon capture system using MOF-based systems, Metal-Organic Frameworks (MOFs) novel class of crystalline micro-structured materials known to have a super-high porosity, the highest known among adsorbents. MOFs can reduce energy consumption in the regeneration step to half compared to benchmark technology such as amine scrubbing (~105 kJ/mol for amines vs. ~54 kJ/mol for MOFs).

ASCO HRR-CO2 will achieve a very high CO2 capture rate (90 % recovery) and produce Clean Hydrogen with a very low carbon intensity. HRR-CO2's carbon intensity range is expected to be at the very bottom of the carbon intensity range for commercial-scale hydrogen production and significantly better than traditional technologies that do not incorporate CCS."

How does your decarbonisation-related product, process or solution benefit the industry or users?

Advanced natural gas reforming technology & permanent carbon capture & sequestration, which potentially decreases the regeneration energy consumption by up to 2.7 times compared to well- established technologies, to produce low carbon hydrogen for conversion to Blue Methanol or synthetic natural gas or synfuel by Fischer Tropsch or MTG or STG in combination with CCS.


Please provide any examples of how your decarbonisation-related product, process or solution has been used in the field and what sort of impact it has or can have.

"ASCO HHR-CO2 can be used to produce Clean Hydrogen with a very low carbon intensity for conversion to Blue Methanol or synthetic natural gas or synfuel by Fischer Tropsch or MTG or STG.

How will you be promoting your decarbonisation efforts at ADIPEC 2023?

We will promote them showing a case study developed together with the MOFs supplier for CCS, novoMOF which is focuses on the development, the production and the commercialization of metal-organic frameworks (MOFs).





Stand: 9530
Hall: 9
www.atmosi.com

Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions.

Atmos Pipe uses flow and pressure data from control room systems like the supervisory control and data acquisition (SCADA) system to consider sensitivity requirements and support large and complex CCS pipelines as they transport CO2 from offshore to onshore. Atmos Wave Flow similarly provides leak detection for CCS pipelines, combining volume balance and negative pressure wave algorithms. The leak detection module in Atmos Simulation (SIM) Suite uses a sequential probability ratio test to calculate leak probability and can provide accurate leak warnings and alarms on a CCS pipeline. Another decarbonisation initiative being supported by Atmos' simulation software is its ability to improve efficiency and reduce energy consumption on operational gas pipelines. Atmos Intelligent Optimizer (AIO) uses cloud computing and machine learning to run complex pipeline simulations quickly on gas transmission and distribution networks.

How does your decarbonisation-related product, process or solution benefit the industry or users?

Leak detection solutions from Atmos International (Atmos) can detect leaks quickly and effectively while simulation software solutions optimize gas pipeline operations. Atmos Pipe's fine tuning capabilities can factor in the hydraulic profile of an offshore CCS pipeline and the seawater surrounding the pipeline. Atmos Wave Flow ensures quick leak detection, accurate leak location, high sensitivity and a low false alarm rate on CCS pipelines. Supporting the need for high sensitivity and reliability on a CCS pipeline, Atmos SIM Leak Detection processes discrepancies to generate only accurate leak alarms. Atmos Intelligent Optimizer (AIO) assists pipeline operators in modeling the pipeline's behavior, managing network capacity and tracking gas quality throughout the system.

Please provide any examples of how your decarbonisation-related product, process or solution has been used in the field and what sort of impact it has or can have.

Details to be confirmed.

How will you be promoting your decarbonisation efforts at ADIPEC 2023?

A team will be at the event to discuss this.



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AI-DRIVEN VISION
ANALYTICS FOR
OIL & GAS**

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ops, improve safety

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More info
contact@aurifysystems.com



**Stand: M101
Hall: MI**

www.aurifysystems.incubatehub.com

Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions

Aurify Systems specialises in providing Artificial Intelligence based automation through cameras by using technologies enabling vision analytics.

How does your decarbonisation-related product, process or solution benefit the industry or users?

Our vision analytics solutions, can directly reduce use of physical infrastructure like sensors, different types of specialised devices which are many a times required for achieving the same things which can be done through cameras by our application. With processing of camera feeds on the existing computers, most of the time we can address multiple use cases. We can also do machine runtime analysis and give inputs for optimal use of machinery to optimise the energy consumption. There are also solutions that can reduce the wastage of energy consumed through image analysis and automated monitoring.

Please provide any examples of how your decarbonisation-related product, process or solution has been used in the field and what sort of impact it has or can have.

In case of intrusion systems, many a times, specialised devices are used to detect movement, tampering etc. which are not needed as such detections are possible only by processing the video feeds through our application at real time. Also relevance of these solutions is large, eliminating hardware/sensors used for fire detection, people counting or many a times replaces RFID technology too. Image analysis reduces wastage of energy consumed like electricity.

How will you be promoting your decarbonisation efforts at ADIPEC 2023?

We would be running automated presentation on computer screens on our booth throughout the event. There are no special sessions planned highlighting the same.



**Stand: 13690
Hall: 13**

www.bv.com

Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions

Enabling the energy transition Black & Veatch has been supporting MENA clients and communities for more than 30 years. We offer proven expertise to help the region decarbonize conventional energy assets and develop and integrate renewables and alternative fuels infrastructure.

- Solar: 49+ GW global experience
- BESS: 25+ GWh global experience
- Wind: 56+ GW global experience
- World's largest hydrogen production and storage project in construction

How does your decarbonisation-related product, process or solution benefit the industry or users?

We know hydrogen Decarbonizing our global economy – our industries, utilities, personal transportation and the production and movement of goods – will require a united effort. Clean, sustainable hydrogen has the potential to reduce and replace our reliance on fossil fuels for heating, transport, production of green chemicals and fertilizer, storage and electricity generation.

Please provide any examples of how your decarbonisation-related product, process or solution has been used in the field and what sort of impact it has or can have.

Black & Veatch is building 365 megawatts of electrolysis capacity across three projects, all scheduled to go commercial before 2025. To put that number in perspective, we are more than doubling the world's electrolysis capacity with our projects!

How will you be promoting your decarbonisation efforts at ADIPEC 2023?

Meet our decarbonisation experts on stand 13690. Hear Youssef Merjaneh, Managing Director, Black & Veatch EMEA, during the strategic panel discussion 'Unlocking hydrogen trade corridors to meet decarbonisation targets' 4 October, 10:00 – 11:00.



**Stand: 8556
Hall: 8**

www.bolloré-logistics.com

Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions.

Bolloré Logistics is committed to reducing scope 3 CO2 emissions by 30% by 2030, linked to the provision of its transport services. The company has launched eco-responsible service offers using low-carbon fuels such as our offers AirSAF and SEAalternatives (to use Sustainable Aviation Fuel and Sustainable Maritime Fuel in the shipments) or the use of electric trucks for urban deliveries, as well as reducing the packaging impact of transport thanks to the optimization of packaging.

How does your decarbonisation-related product, process or solution benefit the industry or users?

Bolloré Logistics has been committed to reducing GHG emissions from its direct and indirect activities. By providing lower carbon transport services, reusable packaging, and above all, tailor-made and step-by-step support to benefit its clients in order to achieve common goals, Bolloré Logistics contributes to industry, and in particular the transport and logistics sector, decarbonization.

Please provide any examples of how your decarbonisation-related product, process or solution has been used in the field and what sort of impact it has or can have.

Bolloré Logistics is committed to reducing scope 3 CO2 emissions linked to the provision of its transport services by 30% by 2030. In India, we recently deployed a fleet of trucks running on Compressed Natural Gas (CNG) at our facilities in Mumbai, Bangalore & Chennai. Four CNG trucks are currently carrying out intra-urban distribution operations. The fleet is expected to expand to other sites by 2023. To date, the trucks have covered more than 35,000 km saving 6.5 tons of CO2 emissions compared to diesel trucks. CNG presents way lower NOx and Particulate Matter emissions than the diesel trucks used today, thus contributing to reduced urban air pollution.

How will you be promoting your decarbonisation efforts at ADIPEC 2023?

At ADIPEC 2023, Bolloré Logistics will showcase its decarbonization commitment through presentations, interactive displays, and networking. The company aims to lead in emissions reduction and sustainable logistics, making a strong impact at the event.

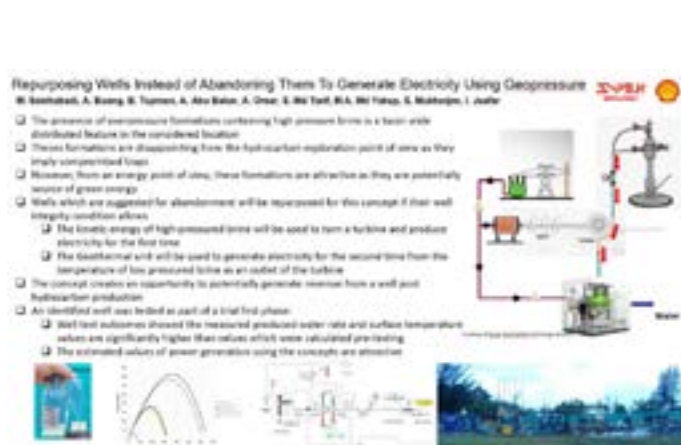


**Stand: 11114
Hall: 11**

Brenpower offers an innovative solution for advancing decarbonization by optimizing steam energy usage, reducing wastage, and swiftly identifying and addressing steam leakages. This approach leads to a significant reduction in carbon emissions, providing industries with improved energy efficiency and reduced operational costs. Our technology also aids businesses in aligning with global environmental standards, enhancing their carbon footprint, and gaining a competitive edge.

We have successfully implemented our solution in practical applications, contributing to a greener environment and empowering industries to achieve their sustainability objectives. At ADIPEC 2023, we will be presenting our solution through engaging presentations, informative brochures, and interactive demonstrations. This will underscore the multitude of benefits it offers and its alignment with global sustainability goals.

Bren SAMP, the Steam Analyzer Management Platform, is an advanced tool within our portfolio. It analyzes steam pipelines by establishing connections between steam generation and consumption points, including critical equipment. Managed by an AI-based cloud platform, Bren SAMP excels at detecting pressure and energy losses within pipelines and identifying steam leakages in real-time. This platform not only optimizes fuel consumption for steam generation in industrial plants, ensuring efficient energy use but also plays a pivotal role in decarbonization efforts within the steam technology sector, contributing to sustainability goals by reducing carbon emissions. Moreover, Bren SAMP provides immediate alerts to maintenance teams upon detecting steam leaks, facilitating prompt repairs, and minimizing energy wastage. In essence, Bren SAMP is a cutting-edge solution that enhances energy efficiency, reduces operational costs, and significantly contributes to the decarbonization of steam technology.



Brunei Shell



**Stand: 13770
Hall: 13**

Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions.

Repurposing of existing oil and gas facilities instead of decommissioning them to generate electricity as an additional stream of revenue is an attractive option. It will potentially unlock a significant source of green energy to generate another stream of value by keeping the same workforces who are skilful in fossil fuel industry, using oil and gas facilities and facilitate smooth transition into net zero which helps in reducing carbon emission.

How does your decarbonisation-related product, process or solution benefit the industry or users?

Repurposing of existing oil and gas facilities instead of decommissioning them to generate electricity as an additional stream of revenue is an attractive option. It will generate another stream of value using existing facilities without a need to drill a new well from scratch. It potentially reduces costs and facilitates required for the large-scale commercial production from overpressured formations. Economic, as said before, have been one of the main constraints in large-scale commercial production from such resources globally due to well costs which can be addressed using the well repurposing concept of the idea.

Please provide any examples of how your decarbonisation-related product, process or solution has been used in the field and what sort of impact it has or can have.

A workflow for scale-up commercial production plan going forward to repurpose all or some of identified wells which have passed a screening process and ready to be abandoned to generate electricity is presented. An extended well test was planned and performed to collect information including performance of overpressured formations, pressure, temperature, liquid flow rates, water samples for off-site analysis and potential for solids production. The main aim was also to have a simple, cost-effective test package design while safely delivering project objectives. The large-scale commercial development can include deepening identified wells as horizontal wells to maximize water production rate. It also can include clustering wells into a manifold on the surface to increase generated power. The estimated power generation for these scenarios indicated reasonable and attractive values.

Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions.

In 2021, Carbon capture and storage (CCS) effectively captured 40 million tons of CO₂, primarily in onshore industrial projects. As we enter 2023, CCS emerges as a promising solution for reducing greenhouse gas (GHG) emissions in the maritime sector, aligning with the International Maritime Organization's (IMO) goal of achieving net-zero emissions by 2050. Bureau Veritas is exploring CCS integration on operating vessels, creating a crucial opportunity to decarbonize the marine industry.

How does your decarbonisation-related product, process or solution benefit the industry or users?

As a classification society, Bureau Veritas plays a crucial role in advancing Carbon Capture, Usage, and Storage (CCUS) technology safely. Our experts collaborate with equipment manufacturers to manage risks in advanced technologies. We assess shipyard safety, review vessel modification designs, and oversee CCUS equipment installation. We also approve equipment and materials, aiding shipowners in integrating systems for waste heat recovery, compression, and liquefaction. With our technical expertise, we create efficient carbon capture solutions, ensuring onboard safety and navigation while addressing potential risks.

Please provide any examples of how your decarbonisation-related product, process or solution has been used in the field and what sort of impact it has or can have.

Rotoblast's thermocatalytic decomposition (TCD) process for carbon capture earned preliminary approval from Bureau Veritas Marine & Offshore. This groundbreaking technology transforms natural gas into hydrogen and solid carbon through a liquid catalyst. The resulting hydrogen has diverse uses, from fuel cells to blending in engines or fueling gas boilers. Bureau Veritas is a leader in shipping's carbon capture efforts, engaged in multiple projects. The growing enthusiasm for marine carbon capture signals substantial potential benefits in this sector.



**Stand: 8650
Hall: 8**
www.calgavin.com

Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions.

Heat exchangers play a critical role in numerous processes within the Process Industry and optimising their performance can lead to significant energy savings and environmental benefits. While numerous global initiatives are underway to explore alternative energy sources and methods to harness their advantages, relatively little attention has been devoted to enhancing the thermal efficiency of existing industrial facilities. CALGAVIN is a unique chemical engineering and consulting company working in the field of thermal process enhancement, modifying flow conditions in existing equipment to improve and optimise plant performance.

How does your decarbonisation-related product, process or solution benefit the industry or users?

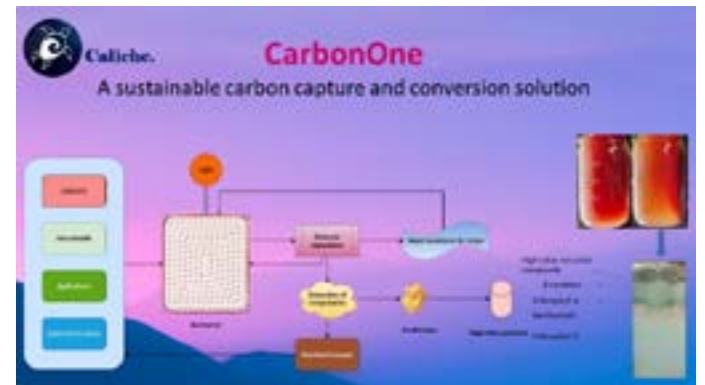
Heat Transfer Enhancement Technology can provide immediate energy reductions. By harnessing innovative methodology, this technology presents a viable pathway to significantly curtail carbon emissions across various industries.

Please provide any examples of how your decarbonisation-related product, process or solution has been used in the field and what sort of impact it has or can have.

Benefits of hiTRAN® Thermal Systems Enhanced Lube Oil Cooler
- Requires only 1/3 of the plot area - Achieves the same heat duty at the same pressure drop - Uses less than 1/2 of the fan power - Allows flexibility to design within noise level limits - Lowest cost option

How will you be promoting your decarbonisation efforts at ADIPEC 2023?

We have an exhibition stand in hall 8 on stand 8650



Caliche Private Limited

Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions.

Our technology, CarbonOne, is a cutting-edge microbial solution that advances decarbonisation by efficiently capturing and converting carbon emissions from oil and gas, refineries, and power plants. By utilizing autotrophic bacteria, we transform CO₂ into sustainable chemicals, fuels, and nutraceuticals, while simultaneously treating food industrial wastewater to enhance circularity.

CarbonOne's innovative approach significantly reduces carbon emissions, providing a viable and sustainable solution for these high-emission sectors. With its potential to convert waste into value-added products, CarbonOne plays a pivotal role in accelerating the transition to a lower-carbon, more resilient energy future.

How does your decarbonisation-related product, process or solution benefit the industry or users?

CarbonOne delivers several key advantages to the industry viz., primarily, it empowers the industry to significantly reduce its carbon emissions by efficiently capturing and converting CO₂ into valuable products, bolstering environmental sustainability and adherence to regulations. Additionally, CarbonOne offers cost-effective carbon capture and utilization, resulting in economic gains and potential revenue streams from sustainable chemicals and fuels. Moreover, by treating food industrial wastewater, CarbonOne fosters circularity, effectively addressing water management challenges. Overall, our solution enables industries to align with global decarbonisation objectives, enhance environmental stewardship, and drive progress towards a lower-carbon future.

Please provide any examples of how your decarbonisation-related product, process or solution has been used in the field and what sort of impact it has or can have.

One successful example of our decarbonisation-related solution, CarbonOne, is the completion of the pilot program under simulated flue gas conditions. Building on the promising results from the pilot, we have now advanced to the industrial pilot phase, actively deployed in two captive power plants. The implementation of CarbonOne in these power plants has demonstrated its efficacy in capturing and converting CO₂ emissions from real-world flue gas streams. Through this industrial pilot, we aim to showcase the scalability and commercial viability of our solution in reducing carbon emissions and contributing to the decarbonisation of the industry.



Stand: 8357
Hall: 8
www.c-capture.co.uk



Stand: 12243
Hall: 12
www.championx.com



Stand: 11460
Hall: 11
www.cptdc.com



Stand: M35
Hall: Manufacturing & Industrial Hall

Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions.

C-Capture's patented, solvent-based technology captures carbon dioxide (CO₂) from emissions. Based on fundamentally different chemistry to other commercially available solutions, our next generation carbon capture tech is a true innovation in the sector. Amine free, our solution is environmentally benign. It also uses less energy than current commercially available approaches and is lower cost. The advantages of our solution mean it has the potential for our solvent to break through the barriers that are currently preventing the widespread adoption of carbon capture and storage technology to mitigate the impacts of climate change.

How does your decarbonisation-related product, process or solution benefit the industry or users?

C-Capture's proprietary, next generation carbon capture technology is a potential gamechanger for industries looking to decarbonise their processes. Extremely robust, it is suitable for use even within challenging, hard-to-abate sectors and well suited to the large-scale capture of CO₂.

Please provide any examples of how your decarbonisation-related product, process or solution has been used in the field and what sort of impact it has or can have.

Our technology was utilised in the world's first BECCS demonstration. We will achieve another world first later this year when our XLR8 CCS project starts the first carbon capture trial on a mainstream glass manufacturing site. XLR8 CCS aims to demonstrate that carbon capture technology is a reality in the race to net zero and will deploy our solvent-based solution on three difficult-to-decarbonise industries: glass, cement and energy from waste.

How will you be promoting your decarbonisation efforts at ADIPEC 2023?

C-Capture are exhibiting at ADIPEC in Hall 8, Stand 8357

Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions

ChampionX redefines LDAR programs through cutting-edge technology. Our AURA OGI camera ensures transparency, compliance, and resource efficiency. Our SOOFIE CEMS system revolutionizes emissions management. Our drone, helicopter, and fixed-wing platforms equip operators for quick, high-quality insights and comprehensive quantification. This triad of offerings cements our commitment to driving sustainable progress, equipping the energy industry for a seamless, responsible, and sustainable future.

How does your decarbonisation-related product, process or solution benefit the industry or users?

Our AURA Optical Gas Imaging (OGI) camera – With unrivaled high-resolution imaging and accessibility, simplifies leak identification, while its wireless connectivity fosters real-time collaboration and effective training. AURA's architecture supports future adaptability, ensuring compliance with dynamic regulatory requirements. Our SOOFIE CEMS system, with over 8000 units globally, offers cost-effective continuous emissions management for Oil & Gas operators, landfills, and coal mines.

The synergy of our drone and helicopter platforms with OGI cameras manifests swift surveys and actionable insights, facilitating quick detection with unmatched imagery resolution. For comprehensive emissions quantification, our fixed-wing platform excels. Trusted by researchers and regulators alike.

Please provide any examples of how your decarbonisation-related product, process or solution has been used in the field and what sort of impact it has or can have.

We provide emissions quantifications for wide array of both point sources and regional sources, such as power plants, gas wells, landfills, and refineries. Our small-scale point source measurements provide insight into site-specific emissions, and can help answer questions such as: Is your facility compliant with industry regulations? Species commonly measured include methane (CH₄), ethane (C₂H₆), carbon dioxide (CO₂), and nitrous oxide (N₂O).

How will you be promoting your decarbonisation efforts at ADIPEC 2023?

Display our SOOFIE and AURA OGI camera, Run demos and presentations and Share global case studies with our clients.

Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions.

China Petroleum Technology and Development Corporation (CPTDC) have proposed newbuild hybrid, grid-compatible land rig which is capable of reducing emissions intensity by 10%-15%, in support of ADNOC's commitment to reduce greenhouse gas emissions intensity by 25% by 2030. This is the first time that CPTDC have supplied rigs with "green rigs" value with lower CO₂ emission through upgrade and modifications of the rig. In March of 2023, ADNOC Drilling awarded Newbuild Contract for Ten Hybrid Power Land Rigs to China Petroleum Technology and Development Corporation in the People's Republic of China. The units are 1500HP Fast Desert Moving design with capabilities to work in cluster wells.

How does your decarbonisation-related product, process or solution benefit the industry or users?

"Green rigs" value with lower CO₂ emission has been applied to the rig design through upgrade and modifications of the rig.

Please provide any examples of how your decarbonisation-related product, process or solution has been used in the field and what sort of impact it has or can have.

The newbuild hybrid, grid-compatible land rig is capable of reducing carbon emissions intensity by 10%-15%

How will you be promoting your decarbonisation efforts at ADIPEC 2023?

We would like to showcase a technology, product or solution centered around decarbonisation at our ADIPEC exhibition stand and present our organisation's decarbonisation product, service or solution at our ADIPEC stand.

Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions

The first low carbon UPS solution in the world, a Chloride® solution. The best of SMC (Sodium Metal Chloride) battery technology integrated with the latest generation of UPS Chloride® to offer a unique chance to reduce the carbon footprint.

How does your decarbonisation-related product, process or solution benefit the industry or users?

Enabling the net zero transition, our SMC battery solution (Sodium Metal Chloride) brings several benefits : - No battery cooling any more (CO₂ savings linked to kWh savings) - Foot print 3 to 5 time less (CO₂ savings linked to Concrete & construction savings) - 20 years life time battery against usually 5 (CO₂ savings linked to the manufacturing) ...

Please provide any examples of how your decarbonisation-related product, process or solution has been used in the field and what sort of impact it has or can have.

Customers use this system to avoid HVAC cooling when they implement a UPS in warm places as desert for example. With this system until 60° the system can operate all days long during 20 years ! And they save CO₂ emissions because they save kWh consumption.

How will you be promoting your decarbonisation efforts at ADIPEC 2023?

Presentations on our booth M35



Stand: 3168
Hall: 3
www.cleantekinc.com

Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions.

Heat exchangers play a critical role in numerous processes within the Process Industry and optimising their performance can lead to significant energy savings and environmental benefits. While numerous global initiatives are underway to explore alternative energy sources and methods to harness their advantages, relatively little attention has been devoted to enhancing the thermal efficiency of existing industrial facilities. CALGAVIN is a unique chemical engineering and consulting company working in the field of thermal process enhancement, modifying flow conditions in existing equipment to improve and optimise plant performance.

How does your decarbonisation-related product, process or solution benefit the industry or users?

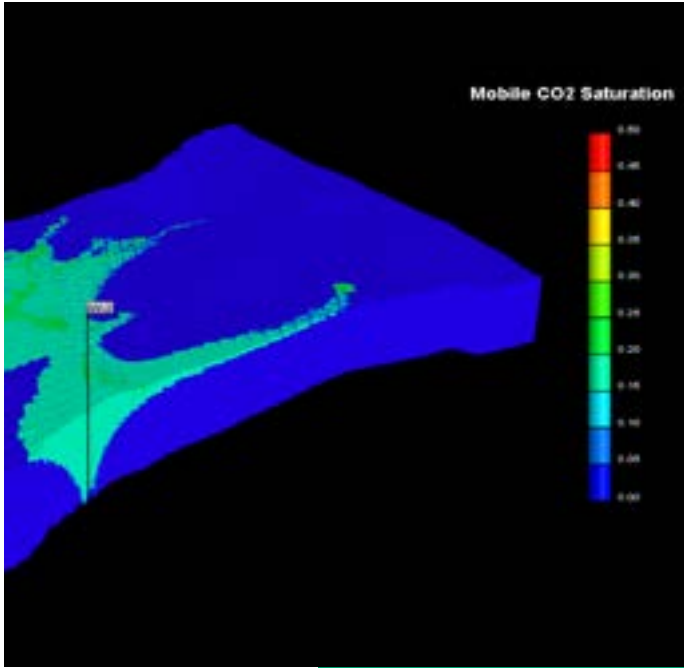
Heat Transfer Enhancement Technology can provide immediate energy reductions. By harnessing innovative methodology, this technology presents a viable pathway to significantly curtail carbon emissions across various industries.

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Benefits of hiTRAN® Thermal Systems Enhanced Lube Oil Cooler
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- Allows flexibility to design within noise level limits - Lowest cost option

How will you be promoting your decarbonisation efforts at ADIPEC 2023?

We have an exhibition stand in hall 8 on stand 8650



Stand: 12302
Hall: 12
www.accelerate.cmgl.ca

Computer Modelling Group (CMG)

Longer forecasting timescales, limited subsurface data, and public safety and environmental concerns increase the complexity of carbon storage projects exponentially. Computer Modelling Group’s 20 years of experience in helping energy companies use CO2 injection to enhance oil recovery can be applied to accelerate the transition safely and effectively to a low carbon future.

CMG’s GEMTM reservoir simulator, originally designed for oil and gas extraction modelling, was enhanced to provide the physical mechanisms required to simulate CO2 behavior in underground formations. Further enhancements have also been developed to allow for the additional complications of storage in the low pressure (and lower temperature) depleted oil and gas reservoirs.

CMG’s CoFlowTM is an Integrated Reservoir & Production System Modelling (IPSM) software that allows detailed analysis of the well and pipeline systems feeding CO2 into the subsurface, modelling steady state flow in the pipeline system. CoFlow’s multi-fidelity, multi-disciplinary, collaborative modeling environment, allows reservoir and production engineers to make informed decisions on large integrated oil and gas projects and is fully integrated with GEM to provide an end-to-end software solution to model CO2 transport and storage.

With the latest software development of Focus CCS, customers now have a solution that supports their process from end-to-end, fast-tracks their time-to-value, and allows them to make business-critical decisions regarding new CCS ventures through faster and more efficient model creation, and automated regulatory reporting. Use CMG’s first-class, trusted software to:

- De-risk a range of energy transition projects related to CO2 storage, H2 storage and production, and geothermal processes.
- Analyze subsurface uncertainties associated with injection and storage of CO2.
- Quantify storage volumes, long term stability, and applicable injection rates for CO2 storage projects.
- Satisfy regulatory requirements through determining the long-term safe containment of CO2.



Stand: 12313
Hall: 12
www.corodexindustries.com

Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions

Corodex Industries(part of Concorde Corodex Group) proud to introduce the Food Chain Reaction(FCR) technology into its sewage treatment offerings. The company has an exclusive licensing agreement with the Hungarian entity Organica Water to design, manufacture and construct waste -water treatment plants utilizing the FCR technology.

How does your decarbonisation-related product, process or solution benefit the industry or users?

The technology incorporates a solution that is inspired and supported by nature, which is cost-effective, simultaneously provides environmental, social and economic benefits and help build resilience.

Please provide any examples of how your decarbonisation-related product, process or solution has been used in the field and what sort of impact it has or can have.

FCR is a product where it reduces the energy consumption by 30%-40% over the process. Finally, the use of green plants in the treatment process contributes to cleaning the atmosphere by absorbing CO2 and producing precious oxygen.

How will you be promoting your decarbonisation efforts at ADIPEC 2023?

Yes, we are exhibiting in ADIPEC. This will be an initiative to present our decarbonization product.



Stand: 12235
Hall: 12
www.concretcanvas.com

Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions

Concrete Canvas focuses on sustainable manufacturing to reduce CO2 emissions, waste, and pollution. Our products, known as Geosynthetic Cementitious Composite Mats (GCCMs), are designed for erosion control and containment. Concrete Canvas® (CC) is a flexible, concrete-filled geosynthetic that becomes a thin, durable concrete layer when hydrated. It’s essentially Concrete on a Roll™ and is 10-times faster to install than traditional concrete.

How does your decarbonisation-related product, process or solution benefit the industry or users?

Our products offer a greener alternative to traditional concrete for surface erosion applications like Channel lining and Slope Protection. In the UK, using Concrete Canvas typically results in a 60% CO2e saving compared to conventional concrete methods.

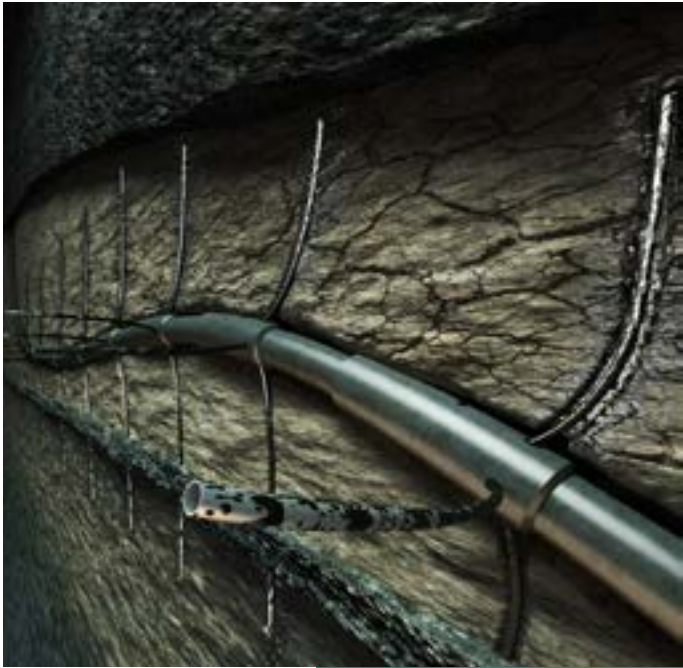
Please provide any examples of how your decarbonisation-related product, process or solution has been used in the field and what sort of impact it has or can have.

A third-party consultancy, Ricardo, conducted a Life Cycle Assessment of Concrete Canvas (CCT2) for an 1,800m2 channel. The study evaluated raw material extraction, production, installation, and end of life impacts. Transportation was also considered, CCT2 transported 10 times further.

The findings show CCT2 construction has a 63% lower GWP than ST4. Per m2, 20.6kg of CCT2 is needed, versus 320kg of ST4. The primary life cycle stage for both is cement production, but using less cement with CCT2 resulted fewer CO2e emissions.

How will you be promoting your decarbonisation efforts at ADIPEC 2023?

We are exhibiting at the Wales Stand in Hall 12, stand number 12235.



Stand: 4110
Hall: 4
www.consolidatedsuppliers.com

Consolidated Suppliers Establishment focus has been always in bridging the gap between propelling current industry practices to become more efficient, while increasing performance and production rates. And with that partnering with leading innovative organizations expert in the Oil & Gas industry has been a core value for Consolidated Suppliers that contributing in shaping this industry in UAE over the past 30 years, and in particular to Decarbonization.

To illustrate a few of these technologies, Fishbones Stimulation Technology did achieve ADNOC's increased production targets while simultaneously reducing carbon emissions. Their product has been used in fields all over the world and in the Middle East, with many applications across ADNOC fields. They have had production impacts varying from 2 times up to 10 times production uplift while simultaneously reducing CO2 emissions. The overall reduction in field development costs and total number of well drilling requirements reduces CO2 emissions further.

Another example, CPC Pumps International decarbonization offerings: General duty pumps for carbon capture modules, and High pressure pumps for CO2 / sCO2 transport and injection.

And Echandia, with their unique Heavy Duty Battery Energy Storage System (BESS) alternative using Lithium Titanium Oxid “LTO” for hybridization and increased energy efficiency. The application of heavy-duty battery systems across various industries will help to highlight the possibilities to reduce fuel consumption, and lower maintenance costs.



Stand: 13445
Hall: 13
www.crysound.com

Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions

Acoustic Imagers use the microphone array beamforming technology to acquire the sound source distribution data and collect the video images in real-time with the high-definition camera. By integrating the sound source distribution data with the video image, the changing sound source is dynamically presented on the display screen. It can be used in gas leak detection and partial discharge detection.

How does your decarbonisation-related product, process or solution benefit the industry or users?

Through gas leak detection and partial discharge detection, our acoustic imagers can help our clients reduce their gas emissions, improve their productivity, and prevent industrial accidents that may cause catastrophic damage to the environment.

Please provide any examples of how your decarbonisation-related product, process or solution has been used in the field and what sort of impact it has or can have.

Cases in Gas Leak Detection: Drain valve/exhaust gas leak
Natural gas valve leak

How will you be promoting your decarbonisation efforts at ADIPEC 2023?

1. Display our products and show visitors how to detect gas leaks and partial discharge.
2. Present former cases of decarbonisation efforts we have made.



Stand: 15628
Hall: 15
www.comb-sol.com

CS is offering burners specially designed for Hydrogen for all thermal applications like boilers, spent acid regeneration or rotary kilns for waste. Also, for using Ammonia as a fuel we developed a solution and are preparing a product launch – Amonox existing plants can be revamped. Because we only change the burner, the CAPEX is very low compared to a new plant and the project can be completed significantly faster.

We have clients in Europe & China using our product with Hydrogen as a fuel and save there not only big amount of CO2 but have also the full flexibility to operate their plants with traditional fuels too, depending on the availability of Hydrogen.

Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions

Our flagship product, CarbonKerma, is a blockchain-based exchange that connects capturers of CO2 through Carbon Capture technologies with emitters seeking to offset their emissions. It is, for the first time, turning CCUS removed carbon emissions into offset credits, thereby driving a revenue stream to capturers previously unavailable. Capturers can list their sequestered CO2 on our platform at their chosen price. Each metric tonne of CO2 removed is represented by one CKT, our native token. Buyers can buy the number of tokens they need to achieve their goals, with those tokens able to be sold, retained, or retired. By retiring a CKT, emitters will have successfully offset a tonne of CO2 emissions. Our CKTs have a Unique Carbon Tag (UCT) attached to them, a patent-pending innovation that identifies the location of the sunk CO2, along with well and meter details.

How does your decarbonisation-related product, process or solution benefit the industry or users?

Our marketplace of digitized metric tonnes of sequestered anthropogenic CO2 helps companies with hard-to-abate emissions achieve their sustainability goals while promoting the expansion of Carbon Capture by helping capturers monetize their sunk tonnage. Our contribution to lowering emissions is designed to enable Carbon Capture technologies to scale rapidly, enabling the deep decarbonization needed to meet the Paris Accord goals.

Please provide any examples of how your decarbonisation-related product, process or solution has been used in the field and what sort of impact it has or can have.

We are leading the market by bringing Carbon Capture-derived sequestered CO2 into the voluntary carbon credit market, enabling capturers to monetize their sequestered CO2. We are the first to offer emitting companies, particularly those in energy, transport, and manufacturing, the opportunity to add CCUS to their mix of sustainability initiatives. The platform has launched with its first million tonnes of removed emissions in the US and CKT tokens have begun to transact successfully.

How will you be promoting your decarbonisation efforts at ADIPEC 2023?

Our CEO, Irfan K Ali, will be presenting DigiKerma at ADIPEC. We can also be found at stands 12249A and 12249B, where you can learn more about our marketplace.





Stand: 9157
Hall: 9

DNV’s Pathway to Net Zero Emissions report describes a feasible pathway to limit global warming to 1.5°C by the end of the century.

DNV’s best estimate of how the energy transition is likely to unfold over the next 30 years, points to a 2.3°C warmer planet, the Pathway report offers a feasible way to close the gap to 1.5°C and it draws on the findings from our Outlook report to answer the question: “How can the world achieve 1.5°C within the bounds of techno-economic and political feasibility?”

Those who can, must lead the way Time-wise, it is critical to act now, at speed and scale to avoid the mounting costs of inaction. Policy-wise, tough mandates and bans lie ahead, as well as regulations that nudge desired behavioural changes like flying less, using lower levels of heat, and actively practicing circularity. Transitioning below zero is a true challenge. It means reducing our own emissions to zero and going well beyond that before 2050. For some nations, like the US, it means that the announced ambitions to decarbonize the power system by 2035 and the economy by 2050 are not enough. The good news is that the technologies that could deeply decarbonize world energy are well known, and the transition is affordable long-term measured in relation to GDP. But if those who can don’t go below zero, and in doing so lower the cost and raise the performance of critical technology, we will never limit global warming to well below 2°C.

DNV’s Pathway report is a companion report to the Energy Transition Outlook. It describes a feasible pathway to limit global warming to 1.5°C by the end of the century. We will be promoting our multiple publications and studies that has supported this publication at ADIPEC stand.





Stand: 8750
Hall: 8, German Pavilion

Decarbonization of all process industries is a must, as climate change is obvious and action is required.

Process heat in oil&gas, petrochemical, chemical and other industries is still mainly realized by gas or oil fired burners. Electric process heat, as replacement for gas or oil fired process heating, is an important contribution to decarbonization. With using “green” electricity, carbon emissions can be reduced to zero. Your benefit using electric process heat:

- Carbon free process heat
- Simple installation and maintenance
- Long lifetime and reliability
- Optimal process control

Thousands of electrical process heaters have been in operation in the fields for many years.

ELMESS offers a wide range of electrical heaters for your process:

- Immersion heaters, tank heaters
- Process heaters for gas and liquids
- Block type heaters
- Air heaters
- Room heaters
- Control panels and monitoring equipment

Heaters for hazardous areas with ATEX, IECEx, CCC, CCOE certificates

Process heaters including pressure vessel according ASME or PED

Visit us at our booth no. 8750 in the German Pavilion – we will show you individual solutions for your process heat requirements. Made in Germany.





Stand: CN34
Hall: Concourse
www.enerwhere.com

Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions

Enerwhere, as the leading distributed utility in the region has extensive expertise in the integration and management of solar-diesel hybrid systems by combining data analytics, energy efficiency, and storage capabilities using its in-house developed hybrid manager for off-grid clients. Our latest state of the art solution is the Ultra-Mobile Solar-Diesel Hybrid System, which is a containerized plug-and-play system that can be installed on almost any terrain without any construction limitations. The system is composed of a fully integrated foldable solar system, optional lithium-ion batteries, diesel generators with ComAp controller connected to the hybrid manager, and other components. This system has been commissioned successfully on several sites and has been helping our customers achieve decarbonization and reduce their carbon footprint by lowering their fuel consumption and further relying on solar energy as a sustainable source of energy.

How does your decarbonisation-related product, process or solution benefit the industry or users?

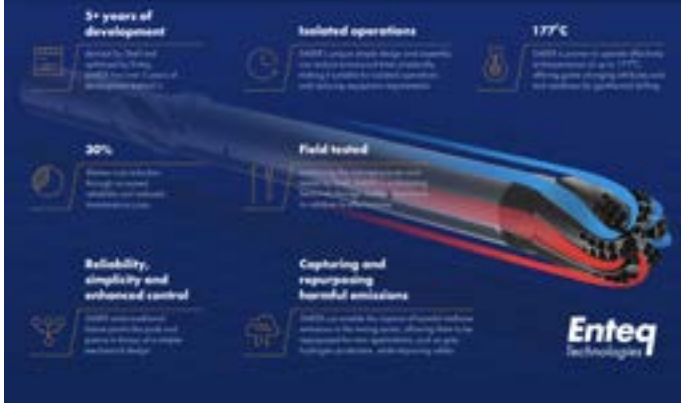
This Mobile Solution has the potential to reduce operation and maintenance costs, introduce remote operation and monitoring, further control energy consumption, lower cost with solar energy savings, eliminate CAPEX requirements, reduce diesel consumption, and lower carbon emissions.

Please provide any examples of how your decarbonisation-related product, process or solution has been used in the field and what sort of impact it has or can have.

This system has been commissioned successfully on several sites in the Middle East and has been helping our customers advance decarbonization and reduce their carbon footprint by lowering their fuel consumption and further relying on solar energy as a sustainable source of energy. Example: GPS and ADNOC.

How will you be promoting your decarbonisation efforts at ADIPEC 2023?

We are planning to have presentations in our booth dedicated to our decarbonization efforts.





Stand: 8431
Hall: 8
www.enteq.com

Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions

Enteq Technologies’ SABER Tool and how it will support decarbonisation: The SABER Tool (Steer-At-Bit Enteq Rotary Tool) is a step change in directional drilling technology for the energy transition sector, developed by Enteq Technologies and based on a concept created by Shell. The ingenuity of the SABER Tool approach lies in the application of proven technologies in novel ways to achieve a sleek, elegant, and mechanically simple design, thereby improving reliability and project uptime versus traditional Rotary Steerable System (RSS) solutions. With SABER’s unique application of Bernoulli’s principle now validated, Enteq has confirmed the tool can deliver true at-bit steering competitively for commercial drilling applications globally, providing significant tool life and reliability benefits. SABER is geothermal and methane capture ready, enhancing its range of applications beyond the offerings of other RSS technologies currently available in the market.

How does your decarbonisation-related product, process or solution benefit the industry or users?

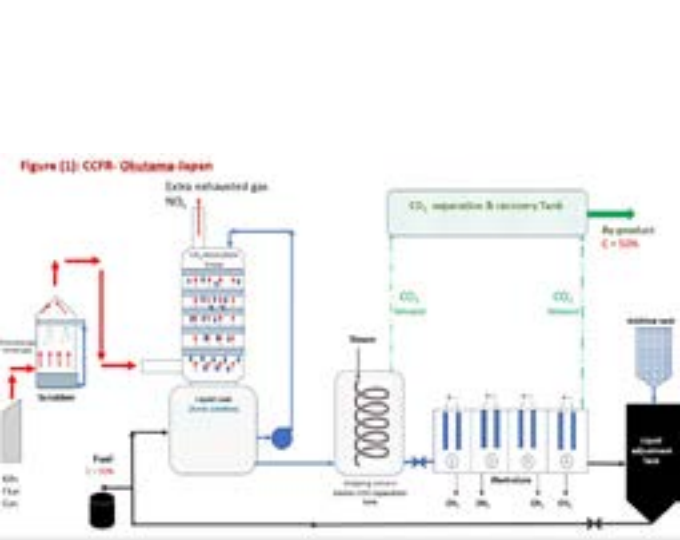
Much of the SABER development and field-testing has been with the involvement of operating companies in the methane capture and abatement sector. In addition, Enteq has worked closely with a geothermal services customer, where there is a potential application for SABER.


Please provide any examples of how your decarbonisation-related product, process or solution has been used in the field and what sort of impact it has or can have.

SABER is a cost-effective simple solution - enabling and assisting energy transition projects: Rather than using pads or plates for steering, the SABER Tool uses an internally directed pressure differential system across the bit face. By removing these external contact points, the tool reduces wear and improves reliability, while also achieving true at-bit steering for the first time. The sleek, plain collar design also allows for a smoother borehole, further improving reliability, uptime and cost efficiency.

How will you be promoting your decarbonisation efforts at ADIPEC 2023?

Please visit Enteq’s stand 8431 to meet the team and see the technology.





Stand: 15902
Hall: 15

Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions

“Carbon Dioxide Capture Fuel Recycle (CCFR) technology is an innovative and sustainable Japanese in-situ technology for capturing CO2 and recycling it into value-added hydrocarbon fuel products with zero waste. The CCFR technology can recover CO2 emitted directly from industrial exhaust gases using a chemical absorption method with an amine-based solution (Patent No. 6267437). The amine-based solution containing the absorbed CO2 is then converted into hydrocarbon fuel products through an electrolysis reaction using the E-Plus low-cost electrolysis process (Patent No: 7245964).”

How does your decarbonisation-related product, process or solution benefit the industry or users?

CCFR technologies working to reduce CO2 emissions with a view toward stopping global warming. CCFR recycles CO2 and produce fuel which, can contribute to the sustainable development goals (SDGs) by applying green factory which close the gap and support a net zero technology application for different manufacturing. CCFR could support ADNOC as one of the UAE's and world's biggest oil producers for reducing the carbon footprint of each unit of energy produced. Therefore, it supports the UAE's Net Zero by 2050 Strategic Initiative.

Please provide any examples of how your decarbonisation-related product, process or solution has been used in the field and what sort of impact it has or can have.

Our technology was demonstrated at the Okutama factory for limestone processing. It helped them capture CO2 and transform it into fertilizer as a byproduct. Additionally, 50% of the captured CO2 was transformed into hydrocarbon fuel without any residuals. This technology contributed to making the factory more environmentally friendly as a green factory

How will you be promoting your decarbonisation efforts at ADIPEC 2023?

We will be running a presentation on our stand





Stand: 11138
Hall: 11

www.ergil.com

Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions

Introducing our Scrubber Systems: innovative chemical gas washers designed to combat the menace of harmful gases and odors. These by products, stemming predominantly from industrial operations, pose grave risks to both human health and the ecosystem. Mitigating this, we've engineered systems that effectively shield the environment from such hazards. By installing air pollution control units, we take a major stride towards environmental preservation, curbing acid rain.

How does your decarbonisation-related product, process or solution benefit the industry or users?

The Scrubber excels in managing high-temperature and moisture-laden streams, while offering a compact footprint. It's adaptable for retrofitting into existing equipment, capable of cooling heated gases, and boasts superior desulfurization capacity at a cost-effective price. Moreover, it efficiently neutralizes highly corrosive gases and dust.

Please provide any examples of how your decarbonisation-related product, process or solution has been used in the field and what sort of impact it has or can have.


Scrubbers are essential for reducing pollution and removing harmful gases in various industries. They capture pollutants, ensuring cleaner air and worker safety. Scrubbers also minimize odors in wastewater treatment and promote resource efficiency. Specific scrubber designs vary based on industry, pollutants, and regulations.

How will you be promoting your decarbonisation efforts at ADIPEC 2023?

Educating industries, policymakers, and the public about scrubber benefits. Showcase cases where they cut pollution and enhanced air quality.

Forging partnerships among industries, environmental groups, and governments. This can yield best practices, tech support, and resources for scrubber implementation.





Stand: 8538
Hall: 8

www.ethosenergy.com

Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions

EcoView is a pioneering solution, created by EthosEnergy, to enable asset owners to fully understand the environmental impact of their rotating equipment, from global warming potential to acidification. Developed in partnership with leading scientists, our new CO2 monitoring tool provides comprehensive environmental insights across each phase of the equipment lifecycle, quantifying with clarity the carbon and financial reductions that can be made from Rotor Lifetime Extension (LTE) compared with purchasing new.

How does your decarbonisation-related product, process or solution benefit the industry or users?

EthosEnergy's EcoView solution demonstrates the significant CO2 savings customers can make with Rotor Lifetime Extension (LTE) compared with purchasing new. The EcoView Life Cycle Assessment – LCA - provides the visibility and transparent data required to make informed equipment choices, align with energy transition requirements, and comply with carbon emissions targets and ESG goals. It provides an alternative sustainable solution to comply with the circular economy. By reusing the existing rotor, customers can actively save natural resources, reduce emissions from new rotor production, and reduce their overall environmental footprint.

Please provide any examples of how your decarbonisation-related product, process or solution has been used in the field and what sort of impact it has or can have.

On average, our LTE solution saves 90 tonnes of CO2 on a single rotor. That's around 560 trips by car from Abu Dhabi to Riyadh! The CO2 saving for the accumulated LTE performed so far is about 2,500 tonnes of CO2 which equates to traveling around the world 375 times!

How will you be promoting your decarbonisation efforts at ADIPEC 2023?

We invite visitors to stop by our stand no 8538 in the UK Pavilion in Hall 8 to discover more about our pioneering solutions and meet our experts. We will also participate in the panel session organized by EIC, where we will contribute to the discussion around Sustainability and Decarbonization.





Stand: 15027
Hall: 15

www.exalto-emirates.com

Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions

Our pioneering decarbonization solution integrates advanced technologies and sustainable practices, led by Torqeedo, Finx and Rimdrive. Torqeedo's electric propulsion replaces fossil fuel engines for eco-friendly boating. Rimdrive's innovative PODS enhance efficiency. Finx provides sustainable marine equipment, reducing resource use. The blueNav blueSpin motor offers hybridization for outboard boats. Our approach revolutionizes maritime decarbonization by combining these elements, reducing emissions, and promoting a sustainable future for our oceans.

How does your decarbonisation-related product, process or solution benefit the industry or users?

Our groundbreaking decarbonization solution, featuring Torqeedo, blueNav, Finx, and Rimdrive, transforms boating sustainably. Torqeedo's electric propulsion and blueNav's tech enhance efficiency, cut carbon emissions, and reduce costs. Rimdrive ensures exceptional performance, while Finx's eco-friendly gear lowers operational expenses. This makes our solution a sustainability leader in the maritime industry, delivering cost savings, superior performance, and environmental responsibility.

Please provide any examples of how your decarbonisation-related product, process or solution has been used in the field and what sort of impact it has or can have.

Exalto Emirates' collaboration on the Autonomous Abra Initiative, integrating Torqeedo propulsion tech, transforms traditional Abra services into a sustainable model. These advanced systems cut carbon emissions and set an eco-friendly benchmark. This initiative demonstrates the synergy of technology and sustainability, reducing carbon emissions while offering efficient transport services. Exalto Emirates' commitment to sustainable brands like Finx, BlueNav, and Rim Drive further signifies their dedication to a greener maritime industry, shaping a sustainable future for enthusiasts and the environment.

How will you be promoting your decarbonisation efforts at ADIPEC 2023?

At ADIPEC 2023, we will showcase pioneering maritime decarbonization projects, emphasizing our commitment to sustainability. Our booth features product displays and experts with in-depth knowledge of advanced propulsion, outboard motors, and eco-friendly marine equipment, all aimed at reducing the industry's carbon footprint.





Stand: 8450

Hall: 8

www.xcd.com

Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions

Well decommissioning, lower-carbon vessel-based decommissioning, carbon-offset well operations/CO2 reduction - design, contract incentivisation, technology & product selection, reducing supply chain fuel consumption.

How does your decarbonisation-related product, process or solution benefit the industry or users?

- Design-feasibility stage - repurpose existing wells for CCUS, hydrogen/blended hydrogen storage.
- UK geothermal/lithium production wells
- Site appraisal: offshore nuclear waste decommissioning facility
- Reservoir management, well design/delivery across lifecycle to optimise well, minimise CO2 generated during well operations on carbon-offset basis.
- Recycle/repurpose option in contracting strategy: late-life asset management to optimise recovery; extend field economic life; lower cost, lower carbon products; integration of renewable energy power supplies.

Please provide any examples of how your decarbonisation-related product, process or solution has been used in the field and what sort of impact it has or can have.

- Vessel/modular rigs complete lower-risk well decommissioning offshore, reducing fuel consumption, optimising mobilisation/internal well moves, reducing costs.
- Delivered award-winning world-first carbon offset well - deepwater offshore West Africa.
- Reuse, refurbishment, repurpose of existing subsea trees reduces carbon footprint, eliminates unnecessary waste, reduces project delivery timelines/cost, de-risks long lead deliveries
- Potential for wells to tie-back into existing assets; extending field's economic life.
- Late-life asset management, Subsurface reservoir analysis, Identifying production enhancement opportunities, Well intervention, Modular rigs - infill drilling, Combined operations decommission wells beyond economic repair, Renewable energy systems power offshore facilities.

How will you be promoting your decarbonisation efforts at ADIPEC 2023?

Via this and SDI Pavilion – discussing energy transition accomplishments, industry awards, relevant projects undertaken.





Stand: CN101

Hall: Concourse

www.expeditors.com

What did your decarbonisation effort entail?

As a non-asset based service provider, the majority of our GHG (CO2e) emissions are attributed to the freight we move on behalf of our customers. We mitigate these transportation carbon emissions by selecting green service providers where available and feasible, and helping our customers manage their logistics networks more efficiently. We also make a difference by managing our facilities more efficiently. Expeditors is actively working together with customers who are interested in reducing their carbon footprint.

What was the goal of your decarbonisation effort?

Expeditors is dedicated to the pursuit of environmental quality in our customers supply chains by helping them measure and reduce the environmental impact of their shipping activities. The supply chain experts in our Supply Chain Solutions team aim to provide analysis and modeling to identify ways to reduce our customers' transportation carbon footprint.

What has been the impact of your decarbonisation effort?

As an example, by conducting a mode of transport conversion from air to ocean or sea+air, made possible through our enhanced order management, we were able to save an estimated 3,705,497 metric tonnes of CO2e through their use of our sea+air program.





Stand: 14170

Hall: 14

www.expro.com

We manufacture hydrogen compressor towards green Energy. Using Hydrogen as fuel, zero CO2 emission.

Expro's Sustainable Energy Solutions In a transitioning global energy landscape, Expro is focused on its own role in the future of the industry, the energy transition, and the technological needs surrounding a lower carbon future. Within the new energy space, Expro is focused on four key areas offering opportunities for growth.

- Geothermal, CCS, Emissions Management and Hydrogen.

How does your decarbonisation-related product, process or solution benefit the industry or users?

The oil & gas industry holds the key to driving transformative change in the energy landscape and many oil & gas companies are diversifying their portfolios to include renewable energy and decarbonisation projects. Simultaneously, major service companies are leveraging their technical expertise to provide crucial support in the development and implementation of new energy projects. Many skills, such as project management, engineering, HSE and logistical expertise, honed in the oil and gas sector, are highly transferable and invaluable to the energy transition. Repurposing oil and gas infrastructure for renewable energy projects, such as offshore wind, geothermal or energy storage facilities, can accelerate the shift to cleaner energy sources, minimizing costs and environmental impact.

Please provide any examples of how your decarbonisation-related product, process or solution has been used in the field and what sort of impact it has or can have.

Expro has built up a significant track record across these fields and demonstrated a history for driving efficiencies and providing solutions to the industry. In one notable 2020 project, Expro provided the well flow management services to confirm the viability of a subsea reservoir for permanent CO2 storage on the Northern Lights project in Norway Expro technologies are being developed to meet the demands of the Energy Transition, focused on reducing carbon emissions and assisting customers achieve their environmental ambitions.

How will you be promoting your decarbonisation efforts at ADIPEC 2023?

During ADIPEC we will be releasing an episode of our Expro Experts Unplugged Podcast series featuring Ingrid Huldal, Expro's Director, Portfolio Advancement, focusing on the importance of sustainability across Expro and the industry.





Stand: 4110

Hall: 4

www.fishbones.as

A number of variables impact a well's Productivity Index. Well stimulation techniques offer operators the opportunity to increase well productivity, while overcoming challenging reservoir parameters. This process increases output per-well and strengthens the overall project economics. Well stimulation techniques can achieve these results through the traditional methods of hydraulic fracturing or acidization. Fishbones offers an alternative solution. One that is safer, greener and cost-effective. Through a unique, expertly controlled pumping operation, our stimulation techniques can connect faults and fractures, bypass any damaged rock and target reservoir sweet spots.

Fishbones Stimulation Technology achieves ADNOC's increased production targets while simultaneously reducing carbon emissions.

Our product has been used in fields all over the world and middle east, with many applications across ADNOC fields. we have had production impacts varying from 2 times up to 10 times production uplift while simultaneously reducing CO2 emissions. The overall reduction in field development costs and total number of well drilling requirements reduces CO2 emissions further.

How will you be promoting your decarbonisation efforts at ADIPEC 2023?

During ADIPEC we will have posters and supporting literature on the stand and our product leads will be present to speak with you and answer any questions.



Flexitallic

**Stand: 8511
Hall: 8**
www.flexitallic.com



FLUENTA

**Stand: 8514
Hall: 8**
www.fluenta.com

**We manufacture hydrogen compressor towards green Energy.
Using Hydrogen as fuel, zero CO2 emission.**

Flexitallic is the market leader in static sealing solutions. Our innovative gasket designs, among which Isoflex™ and Change™, and unique materials, like Corriculite™ and Thermiculite®, are the Best Available Technology for the development, construction, reliable and safe operation of decarbonisation technologies and systems.

How does your decarbonisation-related product, process or solution benefit the industry or users?

The products and solutions offered by Flexitallic result in a lower environmental footprint, increased safety, and higher economic benefits for the end user. First, Flexitallic's cutting edge gaskets provide significantly tighter sealing than legacy technologies, thus reducing fugitive emissions of carbon dioxide, hydrogen, methane, and other hydrocarbons. Second, thanks to API 6FB specification (Fire Test for End Connections), they increase safety of decarbonization solutions. Third, they remove the potential for galvanic corrosion, common to graphite sealing solutions, and crevice corrosion found with PTFE sealing solutions. Last, they allow significantly more energy to be stored in the bolted connection, mitigating long service, component relaxation.

Please provide any examples of how your decarbonisation-related product, process or solution has been used in the field and what sort of impact it has or can have.

Flexitallic high-performance sealing solutions are already being used in dedicated hydrogen pipelines, electrolyser systems, and large-scale decarbonisation projects where they contribute to the overall safety, reliability, cost-effectiveness, and sustainability of these systems. Moreover, we have more than 20 years history in supplying Solid Oxide Electrolyser and Fuel Cells manufacturers with critical components.

How will you be promoting your decarbonisation efforts at ADIPEC 2023?

At our booth, we display our products and brochures dedicated to decarbonisation solutions, and our experts are available to answer any questions on how our products are already contributing to decarbonisation.

**We manufacture hydrogen compressor towards green Energy.
Using Hydrogen as fuel, zero CO2 emission.**

Fluenta is developing a new solution to help oil and gas operators reduce harmful GHG emissions, mainly methane, by improving the combustion efficiency of flared gas.

Recent studies show that flares do not achieve the construed 98% GHG combustion efficiency, but in reality, flares achieve 91%, and the score is much lower in unlit or malfunctioning flares. Such findings suggest that the environmental damage from methane emissions might be as much as four times more severe than previously believed. This revelation underscores the pressing need to revisit our understanding of flaring and reinforce the urgency of enhancing combustion efficiency in the industry. Fluenta is developing a solution that allows operators to enhance the combustion efficiency of their assisted flares. The benefits lead to better levels of GHG destruction (99% and better) and cost savings by more accurate usage of steam and fuels and stronger regulatory compliance.

Fluenta's Active Flare Control initiative is almost fully developed and we have a number of test sites lined up. We're interested in initiating conversations with operators at ADIPEC to show the impact it can have.

Our booth at ADIPEC will include literature on the topic, and our product lead will be present to speak and answer questions.



FOSINA
Sens to Risk

**Stand: 9337
Hall: 9**

**We manufacture hydrogen compressor towards green Energy.
Using Hydrogen as fuel, zero CO2 emission.**

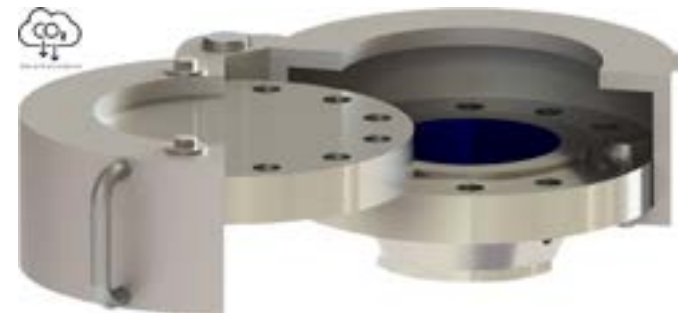
FOSINA developed a state of the art distributed fibre optic sensing solution called DxS that reduces carbon emissions from the design to the end user operations. The design is done so that instead of using three different interrogators to monitor separately temperature (DTS), strain (DSS) and acoustic (DAS), there is only a single interrogator that is capable of doing all measurements reducing therefore the power consumption and carbon footprint required during manufacturing and operations. The optical fibre is used as the sensing element as well as the communication medium, it is therefore acting as a passive sensor with no power required along the entire asset where the fibre is deployed. and completely maintenance free. The DxS monitors multiple features (strain, temperature, acoustic) with a single system which is connected to the fiber optic deployed along the asset, enabling thousands of sensing points simultaneously and in real-time with high resolution down to sub-meter size localization potential.

Please provide any examples of how your decarbonisation-related product, process or solution has been used in the field and what sort of impact it has or can have.

There are many fields where our technology has been proven to decarbonise our client activities. An example is by monitoring the plume of the CO2 and monitoring in real time any leak from a well to minimize environmental hazards. Our real time visualization and distributed method is enabling the client to save operation time and prevent environmental impact reducing therefore their carbon footprint. An example is the saving of source boat effort required which is 24t equivalent of CO2/day.

How will you be promoting your decarbonisation efforts at ADIPEC 2023?

FOSINA will be exhibiting on stand 9337 during ADIPEC 2023 and promoting with case studies and brochures the decarbonisation efforts completed for our clients.



Fulgosi
FIBER OPTIC SENSING

**Stand: 1160
Hall: 11**

**We manufacture hydrogen compressor towards green Energy.
Using Hydrogen as fuel, zero CO2 emission.**

Fulg-O-Blind is a system capable of converting any New or existing Blind Flanging into a Quick Closing Door operated without the use of aids involving CO2 emissions: No Hydraulic Wrenches No Energy Generators No Lifting Means No replacement of Gaskets, Tie Rods & Nuts No team movements (1 Operator is more than enough)

How does your decarbonisation-related product, process or solution benefit the industry or users?

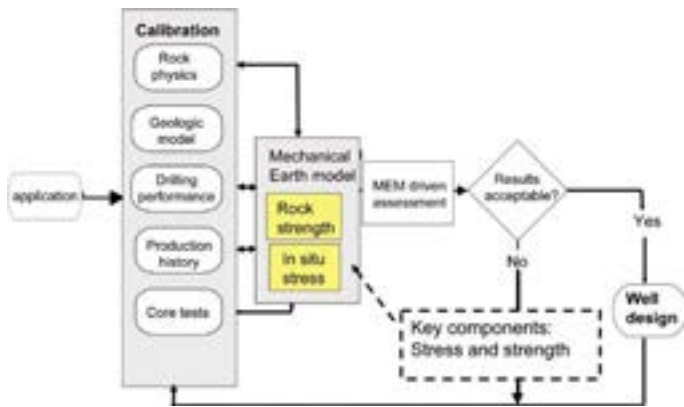
It reduces intervention time to a minimum and introduces a level of guarantee with a Safety Screw suitable for the typical risk involved in Blind ends where, in the event of fluid loss due to a wrong maneuver, once the traditional tie rods have been loosened, it is no longer possible to tighten them back without opening completely and replace the gaskets, but by then the environmental damage has been done and the Operators have been exposed to it. Fulg-o-blind assures the absence of internal pressure avoiding any type of fluid's spill.

Please provide any examples of how your decarbonisation-related product, process or solution has been used in the field and what sort of impact it has or can have.

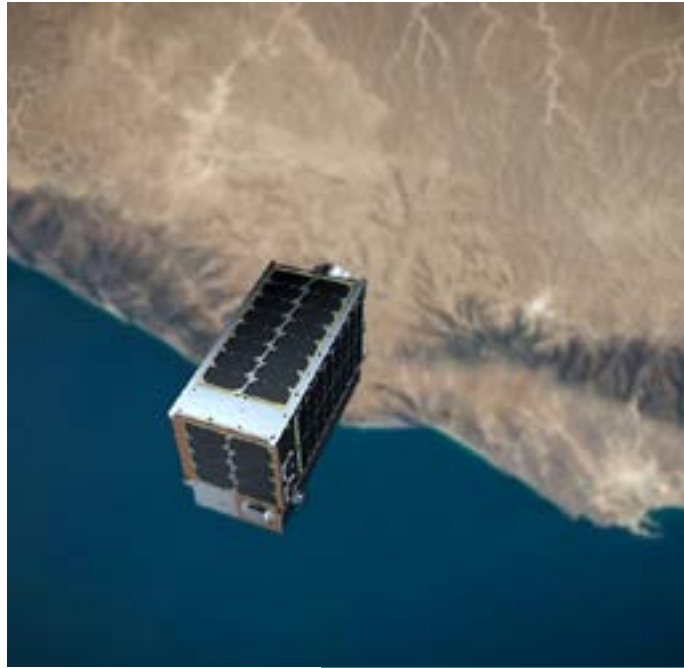
Serbian Gas Distribution Company is operating tenths of Fulg-o-blind devices for Natural Gas Line venting and/or inspection purposes: they're sending ONE Operator on site instead of four, with simply a pair of gloves, no Cranes nor Power Generators nor Hydraulic Wrenches to operate it, nothing else than the operator himself.

How will you be promoting your decarbonisation efforts at ADIPEC 2023?

Fulgosi S.R.L will be present at our booth no.1160 with both Video & Professionals presentation also supported by WhitePaper and Test Results.



Stand: 12235
Hall: 12
www.futuregeoscience.com



Stand: 12312
Hall: 12
www.ghgsat.com

We manufacture hydrogen compressor towards green Energy. Using Hydrogen as fuel, zero CO2 emission.

Our headquarter in UK, and we have two branches, one in Egypt to cover MENA and one in Malaysia . In order to reach potential oil bearing strata drilling companies have typically to drill through thousands of feet of “overburden”. Whilst being of limited interest to the oil company this younger strata contains various hazards and challenges that the drilling company must be able to allow for, both in terms of drilling a cost effective well and ensuring the safety of the rig, drilling crew, and the environment. In the North Sea, and many other areas of the world, this overburden consists of superficially homogenous mudstones making it very difficult to predict in real time when a particular hazard will be reached, potentially resulting in lost drilling equipment, re-drilling and, occasionally, complete well write-offs. Drilling wells, particularly offshore, is an extraordinarily expensive business and these losses represent a major cost burden for the industry. We have identified a way of linking the stratigraphy and mineralogy of these mudstones to strata instability and then creating a 3D stratigraphic model of these mudstone strata. When drilling a new well this will provide the drilling company with an accurate prediction of when a particular hazard will be encountered and thus enable them to design their drilling plan to take proper precautions, such as picking casing points, in the safest and most cost-effective way. This tool can help operators to reduce the time of drilling and control the CO2 emissions better while the output can help to find the best reservoirs to inject CO2 as part of a CCUS (carbon Capture Storage) mission.

How does your decarbonisation-related product, process or solution benefit the industry or users?

This tool can help operators to reduce the time of drilling and control the CO2 emissions better while the output can help to find the best reservoirs to inject CO2 as part of a CCUS (carbon Capture Storage) mission.

We manufacture hydrogen compressor towards green Energy. Using Hydrogen as fuel, zero CO2 emission.

GHGSat is the global leader in high-resolution remote sensing of methane emissions leveraging our company-owned satellites and aircraft sensors. The sensor design and operational capabilities allow for emissions to be detected at the facility level, while the current constellation of 9 satellites provide flexibility to the desired frequency of site observation.

How does your decarbonisation-related product, process or solution benefit the industry or users?

GHGSat delivers customizable monitoring services that can help facilitate actions targeting decarbonization efforts of an operation (i.e. emission reductions). Eliminating methane emissions from oil and gas operations represents one of the best short-term opportunities for contributing to climate change.

Please provide any examples of how your decarbonisation-related product, process or solution has been used in the field and what sort of impact it has or can have.

A recent program GHGSat completed with the Oil and Gas Climate Initiative (OGCI), along with support from Carbon Limits, demonstrated how leveraging satellite technology can enable the identification and mitigation of emissions in an operation. GHGSat's satellites remotely monitored six oil and gas sites across Iraq which provided data that was used to support engagement efforts with local operators. At one specific site, the operator was able to leverage this data to update its sites' operational processes to reduce emissions during operational procedures. At another site, an operator was able to reroute at least part of the gas to a nearby facility for processing and further local use to reduce the emission source. These two examples highlight the power of data and how to leverage it to drive positive change for an operator. The success of this pilot project has generated interest in expanding to additional regions to help drive decarbonization efforts. This program demonstrated that remote monitoring provides the data and insights that can be used to facilitate discussions with operators to drive tangible actions. With a growing constellation of satellites including the expansion to CO2 monitoring capabilities, GHGSat is committed to providing the necessary data to support the industry's drive to decarbonize.

How will you be promoting your decarbonisation efforts at ADIPEC 2023?

GHGSat will showcase its monitoring technology at booth #12312 with its team of experts. Stephane Germain, CEO, will take part in a panel Monday, Oct 2nd - Curbing methane emissions: a global imperative.

SHARED VISION FOR A DECARBONIZED FUTURE



Stand: 5370
Hall: 5
www.gtca.ae

Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions

GTCA, in collaboration with our esteemed partners, Hyundai Heavy Industries Power Systems Co. (HPS) and Amplex Emirates, is proud to present cutting-edge solutions aimed at driving decarbonization by substantially lowering carbon emissions. We create customized solutions designed to address the challenges of carbon emissions across various industries and sectors.

Battery Energy Storage Systems:

Our advanced battery energy storage systems (BESS) play a critical role in helping our customers reduce their carbon emissions. By efficiently storing excess renewable energy generated during periods of high production, our BESS ensure a stable power supply during peak demand hours. This helps to reduce the reliance on fossil fuel-based power sources, which directly reduces carbon emissions.

Carbon Capture Solutions:

Our carbon capture solutions are designed to capture carbon dioxide emissions directly from industrial processes, power plants, and other emission-intensive sources. Through advanced capture techniques, the captured carbon dioxide can be stored underground or repurposed for various industrial applications, preventing its release into the atmosphere, and contributing to a substantial reduction in greenhouse gas emissions.

How does your decarbonisation-related product, process or solution benefit the industry or users?

Carbon capture technology is among the world's top new innovations that could reduce greenhouse gas emissions, allowing energy providers and utilities to keep using abundant and efficient fossil fuels to generate reliable and affordable power. GTCA and its partners provide comprehensive and versatile approach to decarbonization offering:

- Carbon Capture Utilization and Storage: HPS is a leading global green energy solutions provider headquartered in South Korea with superior engineering capability demonstrated by its decades-long track record of success, with Hyundai Heavy Industries' highest quality control standard as a backbone. HPS is at the forefront of the Korean CCUS value chain development with superior engineering capabilities to build high-performing carbon capture facilities.

CO2 captured in the facility will be converted to dry ice then sold to retail distributors (a milestone as the first carbon utilization case in South Korea)

- Renewable Energy Optimization: Amplex Emirates is a leader in the integration of energy storage solutions and the first in the region to build the world's largest grid-scale battery energy storage system (BESS), which is controlled from one central location. Our BESS solutions ensure the efficient use of renewable energy sources across various applications, including onshore and offshore. This reduces the need for fossil fuels and, as a result, cuts down on carbon emissions from power generation.

In line with the UAE government's commitment to carbon neutrality, GTCA is diligently seeking cutting-edge green technologies and innovative solutions, which are essential to accelerate the country's journey in achieving net-zero targets by 2050.

Please provide any examples of how your decarbonisation-related product, process or solution has been used in the field and what sort of impact it has or can have.

- HPS is leading the way in carbon capture utilization and storage technology. HPS is currently developing the largest CCUS plant in Korea, with the capacity to capture 220 tonnes of CO2 per day and transform it into dry ice and CO2 to storage.

- Carbon capture by HPS has been selected to participate in a national project in Korea to develop a Natural Gas Combined Cycle CO2 capture plant, with the capacity to capture 10 tonnes of CO2 per day.

- Amplex Emirates sets a new sustainability milestone with 108MW/648MWh BESS Project. Amplex Emirates, a leading system integrator and EPC solutions provider, has successfully delivered a 108MW/648MWh Battery Energy Storage System (BESS) project for TAQA (formerly known as ADWEA) in Abu Dhabi. This first-of-its-kind project is playing a pivotal role in reducing CO2 emissions by 97,200 metric tons per year. The BESS project is a major milestone for Amplex Emirates and its commitment to sustainability. The project is helping to reduce reliance on fossil fuels and promote the use of renewable energy. It is also helping to improve grid stability and reliability. Amplex Emirates is proud to have played a role in this important project. The company is committed to continuing to work on sustainability initiatives and making a difference in the fight against climate change.



GPT
Industries

Stand: 12326
Hall: 12
www.gptindustries.com

Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions

Our EVOLUTION Isolation kits, lanuched in 2021, serve two primary functions to seal pipeline connection and to Isolate, a is critical to proper corrosion prevention regarding dissimilar metals and for the isolation of cathodic protection current. Carbon emissions released via pipeline connects is one of the leading sources of avoidable carbon emission reduction. According to EPA, leaks from gas pipelines were responsible for 21 million metric tons of CO2-equivalent emissions of methane in 2020. EVOLUTION seals more than 1,000 times tighter than existing isolation gaskets making it a perfect choice for companies wishing to reduce their carbon gas emissions. Through extensive testing, it has been determined that EVOLUTION demonstrates a leak rate of 1cc of helium every 3,000 years.

How does your decarbonisation-related product, process or solution benefit the industry or users?

EVOLUTION provides a significantly longer service life than any other gasket and due to its design, it promotes longer service lives of its mating flanges and equipment. This longer life results in various operator cost savings including reducing unplanned shutdowns, reducing blowdowns, reducing product loss and reducing maintenance spend as well as reduced record-keeping, among others.

Please provide any examples of how your decarbonisation-related product, process or solution has been used in the field and what sort of impact it has or can have.

“The EVOLUTION product has been utilized by over 120 global operators in over 60 countries, in tens of thousands of pipelines.”

How will you be promoting your decarbonisation efforts at ADIPEC 2023?

We will be showcasing out EVOLUTION product and communicating the value it brings in reducing carbon emission.



Gulf Cryo

Stand: 12435
Hall: 12
www.gulfcryo.com

Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions

For more than 70 years in the Middle East, Gulf Cryo has been a regional leader in the manufacturing of industrial and medical gases. One of our primary strategic focuses has been decarbonization solutions through CCUS (Carbon Capture, Utilization, and Storage) and Hydrogen solutions.

Gulf Cryo promotes the use and re-use of “renewable carbon” through various sustainable CO2 applications. We are making significant contributions to decarbonizing various industries by capturing CO2 emissions and turning it into valuable resources. We “fight fire with fire” as a solution to the climate crisis humanity is facing. The Clean CO2 is used in various industries, whether in existing applications or by creating new ones, such as water desalination, agriculture, energy, beverages, algae production, and many more. Here are a couple of the innovative applications:

- Greening Building Materials: it occurs through the decarbonization of the ready-mix concrete sector where CO2 is permanently sequestered into the concrete by mineralization conversion.

- Greening Agriculture: Our efforts extend to enriching the indoor atmosphere of greenhouses with CO2 which is then converted into biomass, boosting crop production and shortening harvest cycles, therefore enhancing local food security.

In addition to managing the full Clean CO2 value chain, Gulf Cryo turns its attention to decarbonizing the transport sector with Hydrogen solutions. The company is implementing an innovative “mobility transition” solution that involves retrofitting diesel-driven heavy vehicles into H2/ Diesel dual combustion. This process enriches the engine’s air intake with up to 40% hydrogen, resulting in a 40% reduction in exhaust CO2 emissions. Importantly, this transformation doesn’t require significant capital expenditure or modification of existing diesel engines. Gulf Cryo is excited to showcase its successful decarbonization solutions, and ADIPEC is a great platform to do so. Please visit our stand nb. 12435 at the Decarbonization Zone in Hall 12.

How will you be promoting your decarbonisation efforts at ADIPEC 2023?

Our stand content at ADIPEC is focused on the decarbonization solutions. There are visual aids and videos displays. Additionally, our team of experts is present on the stand waiting for your visit to thoroughly explain the different solutions offered by Gulf Cryo.



HellermannTyton

Stand: 13379
Hall: 13
www.HellermannTyton.de

Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions

As a leading global manufacturer and supplier of cable management solutions, customers in all industries rely on us to deliver sustainable quality products. We take that responsibility seriously and are dedicated to reducing our carbon footprint and waste. We are working to minimise the environmental impact of our operations and to become a carbon-neutral business. Utilising renewable energy is a key part of HellermannTytons strategy to reduce the greenhouse gas emissions generated by our operations. We also pledge to maximise engineering and production equipment efficiency and minimise unnecessary energy and material consumption throughout the company.

Energy efficiency

- By 2025 we intend to source at least 25% of our electricity from renewable energy, aiming for 100% by 2030
- 100% of our manufacturing sites to obtain ISO 50001 certification

Resource efficiency

- 100% of our manufacturing sites to maintain ISO14001 certification
- Minimum of 30% recycled material content in all plastic packaging
- Successive progress towards full recyclability of all packaging materials
- Reduce water usage at high-risk locations and promote 3R policies (reduce, re-use, recycle)

We aim to drive the innovation of more sustainable products, considering materials, their lifecycle, reuse or subsequent recyclability. We understand that every contribution to reducing emissions through weight reduction and lower energy consumption counts in the long run, as does designing for reuse and improving the recyclability of our products at the end of their use. Through collaboration with our customers, suppliers and partners, we are confident that we will continue to make the biggest differences at the product level through weight reduction, design and material innovation.

Lower CO2 footprint:

- Promotion of environmentally friendlier material options
- Global range of sustainable products using alternative materials Circularity
- Products made with increased amounts of recycled material
- Development of material cut-off return service



HITACHI
Inspire the Next

Hitachi Energy

Stand: 12314
Hall: 12
www.hitachienergy.com

Advancing a sustainable energy future for all.

Hitachi Energy is a global technology leader that is advancing a sustainable energy future for all. Electricity will be the backbone of the entire energy system. Together, with customers and partners, we are co-creating solutions that are helping to accelerate the energy transition. We have placed sustainability at the heart of our Purpose and made a promise to advance a sustainable energy future for all. Sustainability 2030 is our new strategic plan for sustainability, summarizing our key commitments to act and drive business in a sustainable way. Through Sustainability 2030, we are advancing four key areas: Planet. People. Peace. Partnerships.

At Hitachi Energy, our technology and solutions play a crucial role in advancing a sustainable energy future for all.

EconiqTM: Pioneering decarbonization at ADIPEC 2023

Our commitment to sustainability drives our decarbonization efforts At ADIPEC 2023, we will be promoting our decarbonization efforts through our EconiqTM eco-efficient portfolio, showcasing products, services, and solutions designed to deliver exceptional environmental performance. Econiq contributes to the sustainable development of industry and society.

Our progressive journey: Moving toward a decarbonized future.

In 2022, we have achieved the milestone of utilizing 100% fossil-free electricity in our operations since 2022, aligning with our Sustainability 2030 strategy. In April this year, Hitachi Energy was rated among top 5 percent of most sustainable companies, with the award of the Gold by EcoVadis. This achievement speaks to the company’s commitment to optimizing its operations for sustainability while making the world’s energy system more reliable, flexible, and secure.



Stand: 8430
Hall: 8
www.hughes-safety.com

Award winning cooling option for emergency tank showers to temper the water within the tank in hot ambient climates, without the need for power!

EN15154 and ANSI Z358.1-2014 standards state that water delivered by a safety shower should be tepid. In extreme hot climates solar radiation can heat water within the tank to dangerous levels. The Zero Power Cooler, designed and developed in collaboration with Celantel, uses the night time ambient temperature to maintain the daytime temperature of the water, ensuring the delivery of safe and tepid water.

Perfect for remote locations, no power or electricity is required. Maintenance free - no moving parts means expensive service options are a thing of the past. Environmentally friendly. Retrofittable to your existing Hughes emergency tank showers. The Hughes Zero Power Cooler has undergone rigorous testing by TUV and on-site by various clients in the Middle East. The system has consistently been proven to maintain in-tank water temperatures to within ANSI and EN15154 standards without the need for any power. Just one Hughes Zero Power Cooler will save 6,060 kg of carbon per annum compared to a traditional chiller unit. A miniature model of the Hughes Zero Power Cooler and Hughes Tank Shower will be on our stand for visitors to see and our stand graphics will center around more information on the system.



Stand: 2430 /3130
Hall: 2 / Hall: 3
www.hiber.global

HiberHilo is an end-to-end monitoring solution including IoT sensors, satellite connectivity, and a cloud interface. Unique benefits that the solution brings is that it is easy to install - even in the remotest locations, mobile and there is no need for existing infrastructure.

By providing the oil and gas industry with regular, reliable remote monitoring insights, we can provide the data they need, for a cleaner, faster, and more sustainable future. By having a remote monitoring system (as an early warning system), oil and gas companies can for example prevent spills/leaks etc. and thus reduce methane and other gases being released into the atmosphere.

Take our customer in Papua New Guinea. With monthly integrity reports being a government necessity, the customer racked up huge bills in sending out a team of three highly-skilled engineers to perform a highly unskilled task of collecting the readings. Across the company's roughly 100 wells, the monthly cost of well integrity monitoring could easily pass \$100,000. Our customer had been looking to solve this challenge for years, but they needed a digital solution that would be cheaper than a well visit.

They implemented HiberHilo to address its well integrity monitoring challenge. The crew installed HiberHilo pressure sensors on the A-, B-, and C-annuli across its assets, meaning that the company could now report well integrity status to the regulator without the need for monthly trips. Instead, the company would only need to visit the wells for production-related issues and for semi-annual check-ins. The implementation of HiberHilo reduced well visit cost by more than 83%, while also reducing overall well integrity risk. This in turn helped our customer reach its environmental responsibility goals.

HiberHilo is now available in all important regions for oil and gas monitoring. Learn more at HiberHilo.com



GF Hydrogen collaborates with International Development Company (IDC) to bring Hydrogen Energy Equipment to the UAE.

JIANGSU GUOFU Hydrogen Energy Equipment Co., Ltd., (GF Hydrogen) was established in 2016, specialising in the design and manufacturing of green hydrogen generation system (HGS), refuelling stations (HRS), supply system for vehicles and liquefaction plants and vessels. Through its vertical integrated value chain in the hydrogen energy sector, GF Hydrogen is a leading solution provider, playing a big role in the global energy transition.

From 2019 to 2021, GF's hydrogen refuelling station (HRS) market share kept its leading place, with a cumulative market share of 28.4%. In 2021, GF's HRS market share soared to 56%.

Electrolysers

- New Electrode Process Technology, high-efficiency hydrogen generation
- Optimized Electrode Structure & Plating, Raney-Nickel Alloy with higher surface area
- New diaphragm material and design with higher current density
- Optimized Gasket and Frame Sealing of Bipolar Plate Design with longer lifespan
- Alkaline Level Remote Monitoring System

Hydrogen Refuelling Stations

GF hydrogen refuelling stations have a refuelling capacity of 200 to 1000kg per 12h with 35MPa/70MPa refuelling options.

Hydrogen Tanks and liquid hydrogen storage.

Providing solutions for hydrogen long- term storage and long- distance transportation.



Stand: 9110
Hall: 9

Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions

InflowControl has invented and commercialized the Autonomous Inflow Control Valve (AICV®). It is a field-proven technology with over 260 global installations and featured in over 30 publications. It has been proven to both dramatically reduce the associated CO2 and energy required to produce oil, and lower the water production, whilst greatly increasing the hydrocarbon recovery along with reducing environmental impact and lowering OPEX costs.

How does your decarbonisation-related product, process or solution benefit the industry or users?

The AICV® can improve environmental factors and optimize the oil production, in both new and existing wells, by reducing water cut and/or gas oil ratio significantly. The environmental and economic benefit of the AICV® is to provide a balanced inflow of oil along a horizontal well, by autonomously choking or closing the breakthrough compartments and still producing from the rest of the reservoir.

Please provide any examples of how your decarbonisation-related product, process or solution has been used in the field and what sort of impact it has or can have.

The AICV® is proven in oil wells to achieve 50-80% Less Water production 50-90% Less Gas production 50-200%+ More Oil production Lower carbon oil is achieved by reducing the unwanted fluids production which have a direct impact on reducing emissions as shown in the following examples: a) CO2 savings: by not producing the water to surface. Electricity savings and associated CO2 from saved electricity. b) Chemical treatment savings for handling at surface. c) Transportation saving. Significant energy savings in transporting unwanted water to treatment and disposal locations. d) CO2 emissions by the reduction in carbon footprint in building/maintaining the surface facility for handling the unwanted fluid.

How will you be promoting your decarbonisation efforts at ADIPEC 2023?

InflowControl will have a stand in the Norwegian Pavilion and bring along two live demos of the AICV® technology showing how the valve autonomously opens for oil and closing the main flow for water and gas. The technology and its environmental benefits will also be promoted/showcased with videos and presentations.





Stand: 12310
Hall: 12
www.innio.com

Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions

INNIO Group is a leading energy solution and service provider that empowers industries and communities to make sustainable energy work today. With our product brands JENBACHER and WAUKESHA and our digital platform myPlant, we offer innovative solutions for the power generation and compression segments..

How does your decarbonisation-related product, process or solution benefit the industry or users?

INNIO offers solutions for a broad range of low emission energy sources including hydrogen and natural gas. Our “Ready for H2” technologies available today can be converted to operate on up to 100% hydrogen.

Please provide any examples of how your decarbonisation-related product, process or solution has been used in the field and what sort of impact it has or can have.

JENBACHER technology: A beacon project in Germany highlights hydrogen’s promise for the energy turnaround This project by HanseWerk Natur in Hamburg is part of INNIO’s hydrogen strategy and proves that retrofitting to pure hydrogen operation is possible on a MW scale. An existing 1 MW CHP plant was converted and went into operation in November 2020. It is operated with natural gas as well as with various natural gas-hydrogen mixtures and with 100% green hydrogen.

WAUKESHA technology: Natural gas-powered drilling rigs are reducing emissions in the U.S. where three 1 MW Waukesha engines power drilling rigs while running on field gas from existing wells. Using natural gas-powered engines offsets 2,000 gallons of diesel fuel per day, cuts emissions of nitrogen oxides and particulate matter by greater than 99%, and cuts emissions of carbon monoxide and carbon dioxide by 34% and 7%, respectively. In addition to reducing emissions, truck traffic is significantly reduced by eliminating diesel fuel deliveries.





Stand: 14350
Hall: 14
www.innomotics.com

Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions

Siemens Large Drives (now Innomotics) is one of the leading manufacturer of Medium Voltage and Low Voltage Motors as well as Medium Voltage Variable Frequency Drives. Technology leadership of Innomotics help provide high end VFDs which can support operations up to 100MW & for Hi speed operations up to 330Hz. Also they provide continuous operation despite a failed power component by virtue of Cell bypass and Cell Redundancy features. MV Motors can go up to 105MW and has a possibility to operate up to 20,000rpm subject to required power output

How does your decarbonisation-related product, process or solution benefit the industry or users?

Innomotics provide Hi speed Motors with patented design that can operated up to 20,000 rpm thus allowing retrofit of Turbines within available space without additional gear box space, maintenance and losses. This also increase train efficiency and reduce NoX emissions from Turbines. Our VFD & Motor technology support all CCUS applications Additionally Innomotics MV VFDs cater to Grid Coupling applications for power conversion, thus removing Diesel Generators from Offshore platforms and thus improve emissions.

Please provide any examples of how your decarbonisation-related product, process or solution has been used in the field and what sort of impact it has or can have.

Steam Turbine Replacement: Fuel gas is a major source of nitrous oxides, (NOx), Carbon dioxide (CO2) and carbon monoxide (CO) Real life (example) for direct emission rates in Boiler: 1,2 ton CO2 / MWh (10,5kton CO2/MWy) Real life (example) value around 0,5 ton NG/MWh Emission reduction within a steam turbine system is a relation between emission, loading & steam balancing of plant For a 11MW Turbuine replaced by VFD & Electric Motor, operating 8760 hrs per annum Steam turbine: 116.000 tCO2 annual Clean water: 2000m³/day Electric drive train: 0 tCO2 annual* * Assumed use of 100% renewable energy

How will you be promoting your decarbonisation efforts at ADIPEC 2023?

Running Presentation via LED screens LED Kiosk with preloaded details of our offering Highlighting through Social Media like Linked in, ADIPEC invites to clients





Stand: 12210
Hall: 12
www.innowell.no

Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions

Innowell Solutions have developed an inflow control solution called Density Activated Recovery (DAR™) which utilizes density contrast, as opposed to viscosity, to distinguish desired from undesired fluid and is also insensitive to production rate changes throughout the life of the well. Since density contrast is assured for all well fluids, the limitations related to fluid properties and flowrate of the current technologies have been removed, making DAR the first universally applicable autonomous inflow control solution. Furthermore, as fluid density is unaffected by local reservoir pressure, and since the phase fraction of the undesired fluid is the only criterion that determines the status of a DAR system, life-of-well inflow control performance is assured. DAR operates with a minimal pressure drop (Δp) and high flow capacity compared to any other autonomous inflow control system facilitating almost unrestricted production of the desired fluid while maintaining control / breakthrough of undesired fluids. The DAR system is also a binary system, it’s either open for desired fluids or ‘closed’ for undesired fluids where the through-flow area and Δp in both positions can be customized to precisely meet the application needs.

How does your decarbonisation-related product, process or solution benefit the industry or users?

Widespread implementation of DAR Technology could be the game-changer in the drive to decarbonize the industry by facilitating more sustainable, low carbon O&G developments. In fact, DAR may be the first ever technology that can concurrently deliver sustained high oil production, improved recovery, reduced costs, and a significant reduction in the carbon emissions from surface handling and processing facilities; in particular during the tail-end production period when the Carbon Intensity Factor is at its worst.

How will you be promoting your decarbonisation efforts at ADIPEC 2023?

The DAR Technology will be exhibited on the Euro Mechanical stand (#12210) located in the Decarbonisation Zone in Hall 12.





Stand: 11210, 11310, 11230, 11330, 11250
Hall: 11
www.iro.nl

IRO - The Association of Dutch Suppliers in the Oil and Gas Industry and Offshore Renewable Industry

All countries have committed to the Paris Agreement. One of its key outcomes is the global commitment to keep the average global temperature rise well below 2 degrees Celsius.

An important tool to achieve this ambitious but necessary goal is the global transition to climate-neutral energy. In other words, a zero-emission energy supply. Offshore energy offers an additional opportunity for many countries to realize climate-neutral energy through, among other things, offshore wind farms. This can only be achieved by working together. That’s why the Netherlands Pavilion’s message is “Let’s accelerate the energy transition together.”

The members of IRO represent the entire supply chain in the offshore energy industry. Thus, they make a major active contribution to the energy transition. Our members are aware that even the construction of offshore wind farms, for example, has to be done in a clean and environmentally friendly way. Therefore, they continue to innovate to make all their products and services as co2 neutral as possible. Our shipbuilding members have been working for years to build and operate the special offshore ships as CO2 neutral. It is a continuous innovation journey. Decarbonization is now in the DNA throughout the supply chain of the offshore energy industry.

Carbon Intensity Reduction Tool

Kent solutions to planning effective Asset Decarbonisation

Applicable to all Upstream and Midstream facilities

CLIENT CHALLENGE

- What are the best options to achieve Net Zero targets?
- What is the emission reduction potential?
- What investments are required?
- How will this impact the business?
- Is the emission reduction option economically viable?
- How to minimise emissions and associated taxes?
- How to extract maximum value from assets and meet shareholders and customer demand?
- What is the best timing for upgrades?

CARBON INTENSITY REDUCTION PACKAGE

INPUTS

- Production profiles
- Carbon price
- Product price
- Class 1 certificate

ASSESS

- Quantify all CO₂ emissions from flaring, power generation or gas turbines
- Identify opportunities suitable for remaining life of asset perspectives
- Quantify impacts on production
- Economic analysis

OUTPUT

- Carbon intensity metrics
- Quantify CO₂ reduction for each option
- Compare options
- Life of field overview

CLIENT RESULT

- Identify key sources of emissions
- Quantify CO₂ emissions rate for each option
- Comprehensive evaluation of options
- Quantify benefits for each option
- Rigorous options comparison using the same basis and norms
- Clear identification of best options over life of field

STRATEGY SHADEBOARD

High and low CO₂ emissions scenarios

Range of options available

Cost

Benefits

If you would like to know more, please contact:

Peter Henderson
Global Process Technical Authority
Peter.Henderson@kentplc.com
Global - +44 (0) 1224 257047

From applying our methodology to a confidential North Sea Asset, we have identified an immediate reduction in CO₂ financial penalties of £200 M/year with no initial CAPEX.

Benefits

- ROBUST**
Fully automated tool for a systemic and rigorous options identification and evaluation

REDUCED RISKS

Minimal options assessed over full life using all the relevant metrics.

CLEAR STRATEGY

Made the right decision upfront backed up by deep analysis of opportunities.

Stand: 8230

Hall: 8

www.kentplc.com

Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions

Reducing greenhouse gas (GHG) emissions from existing industrial processes is a key part of the journey to achieving Net Zero and reducing industry impact on climate change. Our award-winning Carbon Intensity Reduction Tool (CIRT) offers a practical solution to assess and reduce GHG emissions without requiring any initial capital expenditure, while developing a life-of asset plan for maximising cleaner product output.

Drawing upon our extensive expertise in asset planning, brownfield modifications, and asset life extension, using the Kent Carbon Intensity Reduction Tool, we can accurately simulate and assess the impact of operational and physical modifications on an asset's emissions and production. By providing a detailed offline evaluation, we offer a safe and comprehensive environment to explore different scenarios and fine-tune emissions reduction strategies such as electrification, carbon capture, fuel switching, and asset repurposing, among other.

By evaluating these options based on technical and economic criteria, we prioritize and rank them, ensuring a holistic approach to achieving sustainability goals thus enabling our clients to make well-informed investment decisions for life-of-asset.

Several of Kent's clients have already benefitted from the CIRT. Notably, Maersk Oil realized a remarkable \$30 million NPV in asset rationalization scopes across multiple platforms. Additionally, CNR achieved \$260,000 per year in GHG emissions savings through efficient gas optimization without any capital expenditure.

Two of Kent's subject matter experts will present at ADIPEC's downstream technical conference. Michael Czarnecki will present a range of pathways for generating valuable commodities from captured CO₂, and Luigi Crolla will demonstrate a comparative assessment of cutting-edge chemical looping technology for pure hydrogen production.

How will you be promoting your decarbonisation efforts at ADIPEC 2023?

Beyond our engaging presentations, we aim to enrich the conference experience by sharing our recent accomplishments through video content and marketing collateral showcased at our stand 8230. These materials will highlight our latest projects, successes, and ongoing commitment to driving positive change within the industry and towards energy transition.



KLOPPER
THERM

Stand: 8750
Hall: 8
www.kloepper-therm.de

Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions

Klöpfer-Therm from Germany is specialized in engineering, construction, manufacturing, and installation of electrical heating systems with more than 50 years of experience.

Planned and manufactured according to customer specification, Klöpper-Therm electric heaters are extreme versatile and if renewable energy is used, operation is even carbon free. Our product range is added by customized thyristor control panels, heat tracing solutions and automation suitable to our high-quality heating systems.

- Electrical Heater, PtH (Power to Heat),
- Electric Heaters do not emit any CO2 if operated with green energy.

How will you be promoting your decarbonisation efforts at ADIPEC 2023?

During ADIPEC we will have supporting literature and our product leads will be present to speak with you and answer any questions – come and find us in the German Pavilion, sharing a stand with our sister company Elmess.

KOBELCO GROUP solutions for the next generation of energy
—To create a sustainable daily life—

Ready-to-use services integrated into four phases: production, transportation, storage, and utilization.
 KOBELCO GROUP can realize the vision of decarbonization by combining our best technologies.

	Production	Transportation	Storage	Utilization
H₂ Hydrogen	Production (Water, Electricity, Natural Gas, Biomass, etc.)	Transportation (Pipeline, Ship, etc.)	Storage (Underground, etc.)	Utilization (Power Generation, Industrial, etc.)
NH₃ Ammonia	Production (Natural Gas, etc.)	Transportation (Ship, etc.)	Storage (Underground, etc.)	Utilization (Power Generation, Industrial, etc.)
CO₂ Carbon Dioxide	Production (Industrial, etc.)	Transportation (Pipeline, Ship, etc.)	Storage (Underground, etc.)	Utilization (Power Generation, Industrial, etc.)
LNG Liquefied Natural Gas	Production (Natural Gas, etc.)	Transportation (Ship, etc.)	Storage (Underground, etc.)	Utilization (Power Generation, Industrial, etc.)

Decarbonization

KOBELCO
KOBELCO STEEL GROUP

Stand: 2352
Hall: 2

www.kobelcocompressors.com

Have you implemented decarbonisation initiatives or projects within your company?

Yes

What did your decarbonisation effort entail?

As KOBELCO's Non-standard compressor section, we designed, manufactured and delivered all three types of compressors (Screw, Centrifugal and Reciprocating) to clients around the world to support their decarbonization projects such as clean hydrogen, CCUS, Sustainable Aviation Fuel and others.

What was the goal of your decarbonisation effort?

To achieve client's decarbonization projects by supplying robust, reliable and high efficiency compressors.

What has been the impact of your decarbonisation effort?

KOBELCO proved that our compressor technology is the “Key” to accelerate the market’s energy transition toward carbon neutral society.



Stand: A210
Hall: Atrium
www.linde.com

About Linde

Linde is a leading global industrial gases and engineering company with 2022 sales of \$33 billion. We live our mission of making our world more productive every day by providing high-quality solutions, technologies and services which are making our customers more successful and helping to sustain, decarbonize and protect our planet.

The company serves a variety of end markets such as chemicals & energy, food & beverage, electronics, healthcare, manufacturing, metals and mining. Linde's industrial gases and technologies are used in countless applications including the production of clean hydrogen and carbon capture systems critical to the energy transition, life-saving medical oxygen and high-purity & specialty gases for electronics.

The best way to protect the climate is to avoid CO₂ emissions in the first place. We offer a rich technology portfolio to help industry achieve this. Extending along the entire value chain, our innovative technologies are actively paving the way to a greener future powered by more sustainable fuels such as hydrogen and even green hydrogen. Our decarbonization offering includes pioneering technologies for harnessing renewable energies, avoiding or reducing CO₂ emissions, and capturing and utilizing carbon emissions. We complement this with decarbonization services and digital innovations.

Through trusted, lasting business relationships, we collaborate closely with customers the world over to develop tailored solutions that maximize plant lifecycle productivity, efficiency and service life. Our plants play an indispensable role in the success of customers across multiple industries - from natural gas and oil refining through petrochemicals and fertilizers to electronics and metal processing.

For more information about the company and its products and services, please visit www.linde.com



 JFE Steel Corporation

Stand: 12340
Hall: 12
www.benichu.com



 MASDAR CITY

Stand: CN36
Hall: Concourse
www.masdarcity.ae

Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions

JFE Steel Corporation (“JFE”) has been contributing to the decarbonisation by supplying its high-quality Oil Country Tubular Goods (“OCTG”) products for Carbon Capture and Storage (“CCS”) projects from 2008, which are used for the injection of CO2 to the depleted well.

How does your decarbonisation-related product, process or solution benefit the industry or users?

JFE provide with the recommendations of material to CCS Projects taking CCS Specific discussion points into account, such as, CO phase and condition of depleted reservoir. The solution JFE provides will benefit the operator to avoid the potential corrosion, or by reduction of the cost using optimized material.

Please provide any examples of how your decarbonisation-related product, process or solution has been used in the field and what sort of impact it has or can have.

Under severe corrosion conditions, duplex stainless steel or Ni based alloys had been applied, with high cost and less available in the industry. To solve these problems, JFE developed 15% Cr martensitic stainless steel and 17% Cr steel with martensite and ferrite dual phase, which were commercialized as JFE-UHPTM-15CR and JFE-UHPTM-17CR. Their features are available at JFE's website.

How will you be promoting your decarbonisation efforts at ADIPEC 2023?

JFE is working toward carbon neutrality by 2050 through a multitrack approach aimed at discovering highly innovative technologies with the greatest potential for practical application. The interim goals are to reduce CO₂ emissions (compared to fiscal 2013 levels) by 18% as of fiscal 2024 and by 30% or more as of fiscal 2030. JFE announced to supply a variety of green-steel products under the JGreeX™ brand, which will be produced with highly advanced steelmaking processes with significantly less CO₂ emissions than conventional products, beginning in 2023.

Masdar City, a pioneering sustainable urban community and innovation hub in Abu Dhabi, is decarbonizing the built environment through a focus on low-carbon construction powered by clean energy, sustainable transportation, and investment in climate technologies.

The city's buildings are designed to consume at least 40 percent less water and energy than conventional buildings, and more than 11 megawatts of solar panels currently supply a portion of the city's electricity. Masdar City is moving toward net-zero the standard for new development, with three net-zero energy projects currently under construction. These three buildings will generate at least as much energy as they consume annually using on-site solar panels. Excess energy will be fed into the local power grid. Additionally, leading-edge architectural design will ensure that the buildings consume at least 100 percent less energy than comparable conventional buildings.

Masdar City is also decarbonizing cities through a focus on clean and sustainable transportation. City planners have encouraged walking by designing and building the city to maximize thermal comfort outdoors, even in the summer. Wind tunnels, shading, a wind tower, and other cooling features make the city's core feel five to 10 degrees cooler than downtown Abu Dhabi. Additionally, two generations of autonomous, electric, shared vehicles allow people to move easily around the city with a minimal carbon footprint.

A thriving free zone, Masdar City also invests in and empowers businesses that are helping fight climate change. Portfolio companies in The Catalyst, Masdar City's venture arm, are creating clean energy storage solutions, turning food waste into organic animal feed, turning industrial waste into high-quality ceramic tile, producing skincare products using local plants, and much more.

By reducing energy use, increasing production of clean energy, and incubating future-forward climate solutions, Masdar City is both cutting carbon and accelerating the UAE's journey to net-zero by 2050.



 MAXIMATOR
Maximum Pressure.

Stand: 13473
Hall: 13
www.maximator.de

Maximator has many years of experience with components, power units and test systems especially for hydrogen applications. We also develop special solutions precisely customized to the requirements of our customers. We specialize in manufacturing of Hydrogen Booster pumps, special Hydrogen service valves and fittings.

Our sister company Maximator Hydrogen GmbH is an emerging manufacturer of HYDROGEN REFUELING STATIONS. Hydrogen Technology is our main focus now in the industry.

Below our sister companies who focuses on decarbonisation, Maximator Hydrogen – commercial hydrogen refueling stations Maximator Veteq – qualification and end-of-line testing of H2 storage vessels Maximator Gas Solutions – storage systems and gas recovery units FEST – electrolyzer solutions starting from 2MW size

Hydrogen technology is in focus almost around the world and our technology for Hydrogen applications brings many benefits to the industry.

Hydrogen Refueling Stations - For filling High pressure H2 gas into the Fuel cell cars / trucks / forklifts/ ships / crafts.

How will you be promoting your decarbonisation efforts at ADIPEC 2023?

During ADIPEC we will be running slides on our products and applications at our booth



 MAZE
ENVIRONMENTAL

Stand: 14190
Hall: 14
www.mazeenvironmental.com

We manufacture hydrogen compressor towards green Energy. Using Hydrogen as fuel, zero CO2 emission.

The Maze Method brings a new approach to upstream oil and gas stabilization. The process nearly eliminates stack flare and can reduce emissions by 100 percent. What this amounts to is more oil in the tank at less cost and lower emissions than ever before.

How does your decarbonisation-related product, process or solution benefit the industry or users?

MAZE Environmental's innovative, patented stabilizer technology is eliminating flaring and methane emissions for oil and gas producers. The process has also shown to decrease oil “shrink” to increase net saleable oil and gas volumes.

Please provide any examples of how your decarbonisation-related product, process or solution has been used in the field and what sort of impact it has or can have.

The data collected by MAZE proves the technology will dramatically reduce emissions at the tank. This industry changing technology will help drive oil and gas production to net zero and meet ever more stringent emissions reduction mandates.

How will you be promoting your decarbonisation efforts at ADIPEC 2023?

Maze is in booth 14190. We are available to answer questions about our technology throughout ADIPEC.



Renewables for Subsea Power



Stand: 8450
Hall: 8
www.mocean.energy

Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions

Renewables for Subsea Power (RSP) system consists of Mocean Energy's Blue X wave energy converter, Verlume's Halo subsea energy storage and communications gateway, Transmark's residential vehicle (ARV-i), and a subsea production control system from Baker Hughes. Part-funded by NZTC, the system has been built and is being trialled in Orkney since February 2023.

How does your decarbonisation-related product, process or solution benefit the industry or users?

The project aims to show how green technologies can be combined to provide reliable low carbon power and communications to subsea equipment, offering a cost-effective alternative to umbilical cables, which are carbon intensive with long lead times to procure and install.

Please provide any examples of how your decarbonisation-related product, process or solution has been used in the field and what sort of impact it has or can have.

The demonstrator project is running successfully, and has delivered low carbon power and communication to infrastructure including Baker Hughes' subsea controls equipment and a resident underwater autonomous vehicle (AUV) provided by Transmark Subsea. This shows that the system can benefit any offshore, off-grid application such as carbon capture and storage, replacing dirty diesel generators or decommissioning.

How will you be promoting your decarbonisation efforts at ADIPEC 2023?

Presenting and networking.



Mokveld experts in axial valve systems.



Stand: 11214
Hall: 11
www.mokveld.com

Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions

Reducing fugitive emissions is a top priority in the battle against climate change. That is why Dutch company Mokveld Valves BV has developed a unique zero emission innovation: the world's first valve without dynamic seals to the atmosphere. Mokveld has incorporated an electric actuator inside its new valve, eliminating the stem seal to atmosphere entirely. Common valve designs rely on stem seals to prevent process fluid leakage to the environment. Such dynamic seals are prone to wear and tear and degradation, over time showing increased emissions. By eliminating the stem seal altogether, Mokveld's Zero emission valve prevents any leakage to atmosphere throughout the valve's entire life-cycle. This groundbreaking technology brings achieving Scope 1 GHG goals one step closer; zero FE.

How does your decarbonisation-related product, process or solution benefit the industry or users?

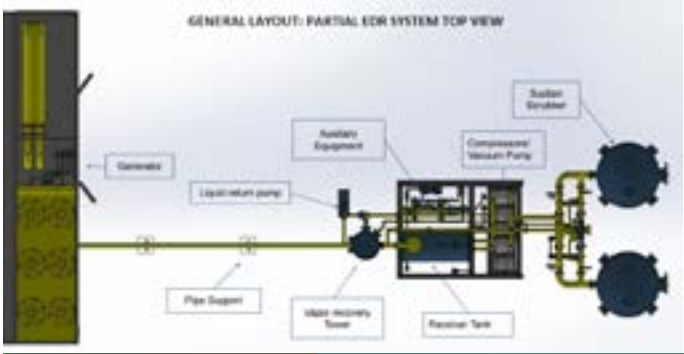
The Zero emission valve consumes very little power and requires a low actuation force. This is achieved by eliminating the stem seal and associated friction in combination with Mokveld's trademark fully pressure balanced design. Power consumption over the valve's lifetime is reduced by cutting power to its drive under steady-state conditions, using a self-braking drive nut. This contributes towards achieving Scope 2 GHG goals; reduced indirect emissions. The low actuation forces in combination with servo control provides for unmatched control accuracy. Mokveld is well known for its one-piece axial flow designs with optimised flow path and full range of control trims. These served as the basis for developing this new valve. It's compact, lightweight design contributes towards achieving Scope 3 GHG goals; reduced value chain emissions.

Please provide any examples of how your decarbonisation-related product, process or solution has been used in the field and what sort of impact it has or can have.


The Zero emission valve is well accepted by the industry and helps our clients to achieve their net-zero ambitions.

How will you be promoting your decarbonisation efforts at ADIPEC 2023?

- We will showcase a Zero emission valve at our stand
- Promote participation via LinkedIn
- Invite our network to visit our stand



GENERAL LAYOUT: PARTIAL EDR SYSTEM TOP VIEW



Stand: 5350
Hall: 5
www.nesr.com

EDR (Emissions & Diesel Reduction) Systems as a Flare & Methane Abatement Technology.

Introduction:

Upstream operators are increasingly utilizing multi-well pads for production, leading to an increase in venting and flaring emissions due to economic, logistical, and surface constraints. This rise in emissions has sparked heightened concern from industry regulators and the general public regarding gas-related hazards. The industry is pushing for reduced emissions, increased environmental awareness, and technology adoption to support low-carbon energy. Government programs and Zero Flare initiatives, aligned with COP goals, now incentivize the reduction of venting and flaring and impose penalties for violations.

EDR (Emissions & Diesel Reduction) Systems:

The most economical way to decrease greenhouse gas (GHG) emissions at well heads & surface facilities is by utilizing an EDR system to recover low-pressure gas. This recovered gas can be harnessed in gas engines or turbines to generate electricity or connected to the existing electrical grid to provide power for on-site infrastructure, as well as for auxiliary revenue sources such as data mining centres.

An EDR System for an oil producing facility with emitted vapours and small process flares captures the vented gas with Vapor Recovery Units (VRUs) which ultimately feed power generation to offset diesel consumption at a given site. A partial illustration of the vent capture EDR System installed on a storage tank is shown above. The recovered vapor can be directed towards a generator to generate power for on-site facilities or for sale, or it can be integrated into the main gas stream (e.g., CNG).

Environmental and Financial impact

An EDR system preventing leakage/venting of a mere 20 MCF/Day (equivalent to eliminating a 1MW Flare) removes 6734 Tons of CO2 per year per MW of flaring with an annual value of carbon credits of approximately 40,000 USD.



NET ZERO TECHNOLOGY ROADMAPPING TOOL

Destination Zero

DECARBONISE WITH CONFIDENCE



Stand: 8450
Hall: 8
www.netzerotc.com

Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions

It's estimated 40% of emissions reduction will come from technologies either still in R&D, or demonstrated but not yet mature.

NZTC's Technology Roadmapping service helps oil and gas clients determine how technologies across zero emissions power, zero routine flaring, venting and fugitive emissions can be adopted and deployed across their assets to help achieve their decarbonisation goals.

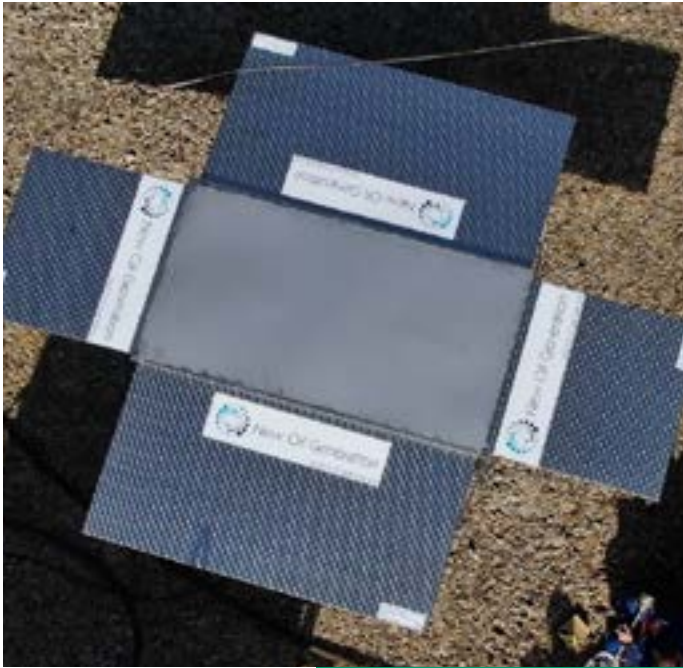
How does your decarbonisation-related product, process or solution benefit the industry or users?

It determines which innovative technologies can be adopted and deployed across your assets to help achieve your decarbonisation goals. We are at the forefront of technology development and deployment, having screened thousands of technologies and supported hundreds of field trials. We favour the disruptors with a hunger for change, using our expertise to scan the horizon and develop insights bespoke to your needs.

Please provide any examples of how your decarbonisation-related product, process or solution has been used in the field and what sort of impact it has or can have.

As part of their decarbonisation strategy, Spirit Energy identified the need to reduce power and venting emissions from assets across their Greater Markham Area (GMA) hub, which spans the UK and Dutch continental Shelves and comprises the Markham, Chiswick, Grove and Kew fields.

To determine which innovative technologies could be adopted and deployed to reduce future emissions relating to power and venting, we applied our Technology Roadmapping tool, evaluating the technology solutions with best fit and impact. We identified a switch to green methanol as a retrofittable alternative fuel for gas turbines alone would provide a 74% reduction in power generation emissions. Opportunities to reduce emissions were illustrated, utilising venting reduction technology, power management system process optimisation tools and increased remote control solutions.





Stand: 15550
Hall: 15
www.newoilgeneration.com

Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions

ECT technology, or Exothermic Chemical Treatment, revolutionizes decarbonization efforts in oil production by drastically reducing carbon emissions. By initiating an exothermic reaction through specialized chemical reactants, ECT efficiently heats the reservoir, lowering heavy oil viscosity and enhancing oil flow. The innovation operates with minimal energy input and eliminates the need for new infrastructure, significantly minimizing the carbon footprint associated with conventional extraction methods. This pioneering approach contributes to sustainable decarbonization by prioritizing environmental responsibility and efficient resource utilization. ECT's exceptional impact is achieved with minimal water usage and without the necessity for additional infrastructure construction, making it a critical player in advancing eco-friendly practices in the oil industry.

How does your decarbonisation-related product, process or solution benefit the industry or users?

ECT solution requires minimal energy input, reduces water consumption, and eliminates the need for new infrastructure while increasing recovery factor of oil reservoir. As a result, ECT enables the industry to achieve significant carbon footprint reduction while ensuring efficient and sustainable resource extraction.


Please provide any examples of how your decarbonisation-related product, process or solution has been used in the field and what sort of impact it has or can have.

By efficiently heating the reservoir through chemical reactions and enhancing oil mobility, ECT significantly increased production rates while curbing carbon emissions. This reduced reliance on traditional EOR energy-intensive methods, leading to a remarkable decrease in the overall carbon footprint of the operation. The adoption of ECT not only improved operational efficiency and profitability but also demonstrated a tangible step toward sustainable oil production, showcasing the potential for substantial industry-wide decarbonisation.

How will you be promoting your decarbonisation efforts at ADIPEC 2023?

At our booth 15550, New Oil Generation will be happy to give a detailed overview of how ECT reduces carbon emissions by minimizing the need for energy-intensive infrastructure, such as steam-based methods.





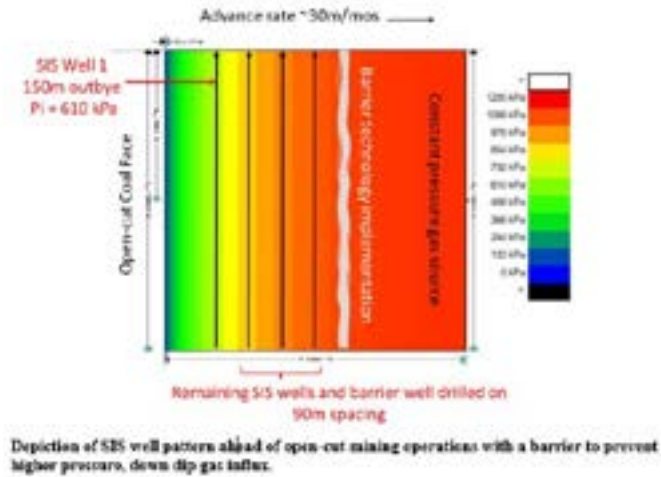
Stand: 9155
Hall: 9

Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions

Norwegian Technology AS (NT) is developing and supplying environmental separation technology, equipment, and chemicals to support the oil and gas industry to reduce the environmental footprint of drilling, production and refinery related activities. The mission is to support with superior environmental performance with a zero-emission and zero-waste target. Separation and recovery of Crude Oil Sludge from refinery, storage, lagoons etc. The production and disposal of oily sludges are considered as one of the most critical environmental issues in the petroleum industry, particularly in the petroleum producer countries. Annually, large more than 60 million tons are generated, and more than 1 billion tons of oily sludge has been accumulated worldwide. NT has demonstrated in several oily sludge clean-up projects that end result is oil are becoming products at the refinery and the water to be discharged or reused. Products and services for waste treatment in production and exploration drilling, “the zero waste solution” onshore and offshore NT is commercializing an all-integrated solution for treatment of drill cuttings, oily water and oil-based mud (OBM). The separation units available are small and energy efficient, allowing water and solids to safely go back to the environment. Oil to be reused. Oily sludge and OBM separation: NT holds proprietary solutions for three-phase separation of oily sludge, drill cuttings and oil based mud (OBM) for onsite treatment both onshore and offshore. Water treatment equipment for produced water treatment or Slop: This technology was offshore field approved last year and presented by Conoco Philips and Aker BP at the Tekna Produced water conference. NT’s mission is to support the industry of production, drilling activities, refinery, and oil storage terminals to moving away from waste management and into resource management to save cost and leave a minimum environmental footprint behind.

How does your decarbonisation-related product, process or solution benefit the industry or users?

Our technology allows the industry moving away from waste management and into resource management by separation at source for reuse. Minimising cost and CO2 emissions.



Depiction of S/S well pattern ahead of open-cut mining operations with a barrier to prevent higher pressure, down dip gas influx.

Novus Fuels

Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions

There is an opportunity to dramatically reduce methane emissions from Australian, open pit, metallurgical coal (MC) mines and substantially reduce the carbon intensity of a high-value Australian export industry. MC is critical to the production of steel products and is essential to meet international urbanisation and energy system transformation goals. Initial research in the application of subterranean barriers in coal mining was towards the reduction of gas influx and whole-of-life coal mine methane (CMM) emissions (Johnson Jr, 2014). However, it lacked economic viability for a majority of cases once carbon pricing was eliminated in 2014. The basis of barriers is similar to naturally occurring barriers (i.e., igneous intrusions or dikes) that have shown effective separation of drained and undrained mine works (as observed in adjoining mines in Central Queensland). Barriers have also been applied in the environmental, civil engineering and oil and gas industries, to manage or restrict subterranean flow patterns or contain contaminants. In this case, subterranean barriers are being implemented in conjunction with mine pre-drainage to reduce methane emissions from an open pit, MC mine. In addition, barriers can be used in underground mining operations to improve mine pre-drainage and safety as well as reduce methane emissions.

How does your decarbonisation-related product, process or solution benefit the industry or users?

We will detail the results of ongoing planning and modelling to implement and assess a barrier application for reducing gas migration from unmined in-seam or underground mine sections into open-cut MC mining operations. Finally, this paper builds on previous research and available technologies and is complementary to current pre-drainage for surface or underground mining operations. Barrier implementation in conjunction with the beneficial use of gas provides a working framework to reduce mine emissions toward necessary methane reductions by 2030.

Please provide any examples of how your decarbonisation-related product, process or solution has been used in the field and what sort of impact it has or can have.

A current research plan is in planning at The University of Queensland to progress operational implementation and an application plan at a Bowen Basin vertical well test site is underway.





Stand: 15031
Hall: 15
www.nozzlesoft.com

Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions

NOZZLE All-in-One Ship Management Software simplifies compliance with Carbon Intensity Indicator (CII) regulations to address climate change within the shipping industry. NOZZLE comprehends the challenges confronted by ship operators in effectively and accurately handling their CII ratings. The Business Intelligence (BI) CII dashboard is an integral component of our user-friendly ship management software that enables seamless adaptation to the new CII guidelines by performing meticulous CII calculations while ensuring compliance.

How does your decarbonisation-related product, process or solution benefit the industry or users?

Our solution enhances environmental responsibility and operational efficiency by addressing the pressing need for compliance with Carbon Intensity Indicator (CII) regulations. It delivers a comprehensive fleet performance snapshot, acquires dependable estimates of vessel CII proactively identifying enhancement opportunities and optimizing operational efficiency. This feature examines non-CII factors on monthly basis, comprehending their influences on ratings, and helps take corrective actions.

Please provide any examples of how your decarbonisation-related product, process or solution has been used in the field and what sort of impact it has or can have.

Customers using NOZZLE on their fleets can identify specific routes and operational practices that are leading to higher CII ratings. By regularly using the dashboard's features, they make informed decisions about optimizing routes, adjusting vessel speeds, and enhancing maintenance practices. In a year, they'll observe a notable decrease in their fleet's average CII rating by 15%, resulting in significant fuel savings and reduced carbon emissions. This improves their environmental footprint and enhances their operational efficiency and cost-effectiveness.

How will you be promoting your decarbonisation efforts at ADIPEC 2023?

We will promote NOZZLE Business Intelligence CII dashboard through Social Media campaigns, Print Media, and Post-Event Follow-Ups.



Stand: 8655
Hall: 8
www.pdms-group.com

Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions

PD&MS provides analysis of assets and operations from an energy efficiency and carbon lifecycle perspective, leading to the development of innovative and bespoke strategies to reduce emissions and energy consumption. With a wide range of carbon calculation tools which evaluate and quantitatively assess the environmental impacts of energy and oil & gas infrastructure, or on a system and component basis, to provide a comprehensive assessment of carbon impact.

How does your decarbonisation-related product, process or solution benefit the industry or users?

PD&MS specialise in low carbon engineering and advisory services that support developing and delivering carbon reduction roadmaps through reliable and sustainable solutions including supporting the assessment and management of scope 3 emissions, using our experience of quantifying supply chain CO2 and formulating solutions to these increasingly challenging emissions. We support businesses to develop their own energy roadmap, building business cases and delivering net-zero solutions.

Please provide any examples of how your decarbonisation-related product, process or solution has been used in the field and what sort of impact it has or can have.

PD&MS conducted a Carbon Management and Reduction Plan (CMRP) for BP on their asset in the Clair Oilfield. PD&MS conducted a comprehensive study assessing the emission baseline, including mandatory scope 1 and 2 emissions, plus scope 3 emissions associated with personnel transfer and support vessels. This identified opportunities to reduce carbon footprint and improve the energy efficiency of the asset with a potential saving of 68% of CO2 emissions over 5 years. PD&MS identified ways to reduce energy generation systems on the asset such as the use of a private wire to connect to a local offshore wind farm to provide renewable power. PD&MS also presented reduction options for scope 3 emissions including improvements to the supplier selection process, sustainable fuel options and engine types. This identified a potential 120,681 tonnes of CO2e savings, and a 90% reduction in NOx emissions. The CMRP equipped BP with the necessary insights to explore avenues for minimising emissions across all their owned assets.

How will you be promoting your decarbonisation efforts at ADIPEC 2023?

PD&MS are exhibiting at ADIPEC, stand 8655.



Stand: 9550
Hall: 9
www.pme.ae

Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions

PME is a key innovator in the oil and gas sector, focusing on decarbonisation technologies. In alignment with UAE's sustainability vision, PME collaborates with industry giants like ADNOC and TAQA to link technology with industry needs. In Carbon Capture and Storage (CCS), PME offers a scalable platform aiming to capture up to 95% of CO2 emissions from processing plants, significantly lowering the sector's carbon footprint. PME also targets fugitive emissions, serving as a testbed for solutions that can reduce such emissions by 70%. Additionally, PME fosters advancements in fuel cell technology, enabling more efficient conversion of natural gas to electricity, benefiting both the environment and the economy.

How does your decarbonisation-related product, process or solution benefit the industry or users?

These synergies don't just amplify environmental impact; they also offer economic advantages by increasing operational efficiency and spawning new avenues for job creation within the energy sector.

Please provide any examples of how your decarbonisation-related product, process or solution has been used in the field and what sort of impact it has or can have.

Example: SAAS Charge Partnership for ADNOC's EV Charging
Problem: ADNOC Distribution needed to integrate sustainable and efficient EV charging into existing service stations.
Solution: Teaming with SAAS Charge, ADNOC installed high-speed, 150 kW chargers across the UAE, managed by SAAS Charge's software. Solar panels were added to power the stations sustainably.
Impact: Carbon Emissions Reduced: Aligns with UAE's 2050 sustainability goals.
EV Adoption Boosted: Quick charging removes adoption barriers. Business Growth: ADNOC tapped into new revenue streams.
Data-Driven: SAAS software enables data collection for planning. PME and its partners are defining what a sustainable energy future looks like, not merely reacting to global calls for decarbonisation.

How will you be promoting your decarbonisation efforts at ADIPEC 2023?

PME is more than a facilitator; it's an innovation hub committed to setting industry standards in carbon capture and decarbonisation. By actively attracting and collaborating with technology providers, we are not just responding to the global call for decarbonisation but leading the way in shaping a sustainable future for the oil & gas sector.



Stand: 2136
Hall: 2
www.procontrolsrl.com

Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions

PROCONTROL Electro-Hydraulic actuators are an engineered combination of actuators and self-contained Power Units to provide operation and control even in the most challenging condition: the self-contained Electro-Hydraulic actuators are independent from pipeline pressure power source and they do not exhaust gas to the atmosphere.

PROCONTROL technologies are designed to operate in harsh and hostile conditions while keeping workers and plant safe while withstanding extreme hot temperature, wind, dust, electromagnetic interference, coastal and hot humid marine environments and operate at full capacity.

PROCONTROL actuators portfolio includes 316SS series suitable for an extensive number of applications including highly corrosive chemical environments and hydrogen. From an operation and production point of view, they lower considerably regular field maintenance costs.

How does your decarbonisation-related product, process or solution benefit the industry or users?

With our solutions we can support our clients with products that will enhance their own approach towards a more sustainable environmentally orientated future and will benefit from reduced OPEX and improved operating profit. Our 316SS series contribute to lowering the plants carbon foot print as well as drastically reduce the use of chemical coatings. Proper material selection is a decisive factor for the durability and lifespan of any infrastructure.

When supporting critical applications, it is essential to understand and decode customer requirements in order to supply bespoke solutions and ensure the highest performance at any time: PROCONTROL Hydraulic Power Units (HPU) provide pressurized oil to drive the hydraulic actuation system generating huge amount of power. PROCONTROL Electro-Hydraulic actuators main features are: ESD capability for "emergency-shut-down" services, Remote & Local PST and operation capability, automatic fail safe in case of electric power failure.



Stand: 8850
Hall: 8
www.protego.de

Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions

"PROTEGO® Valves help to reach Net Zero for a Sustainable Future.

The extreme tightness of PROTEGO® Valves guarantees Zero Emission at Tank Operating Pressure."

How does your decarbonisation-related product, process or solution benefit the industry or users?

Due to the highly developed manufacturing technology of PROTEGO® valves the tank pressure is maintained up to set pressure with a tightness that is far superior to the conventional standard. According to the PROTEGO® Standard PS-001 leak rates are measured at 90% of the set pressure. This testing ensures PROTEGO® Valves exceed the most stringent leakage rate requirements of EPA, API2000 and EN ISO 28300.

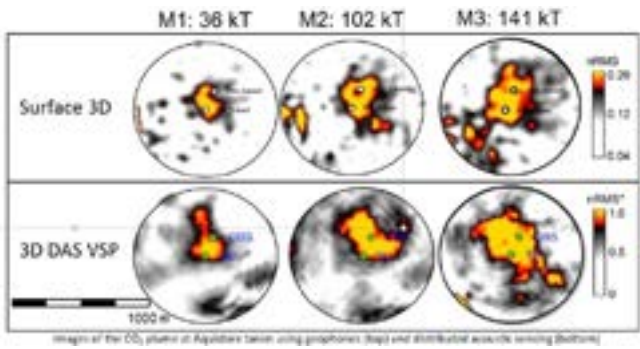
Please provide any examples of how your decarbonisation-related product, process or solution has been used in the field and what sort of impact it has or can have.

"This is the testimonial of one of the world's largest petroleum and petrochemical companies:

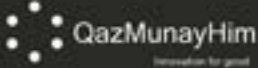
PROTEGO® Valves have an excellent tightness. The leakage of the valve is much lower than the requirement of local environmental protection bureaus. We are very satisfied with the PROTEGO® products."

How will you be promoting your decarbonisation efforts at ADIPEC 2023?

Valve model, PROTEGO App with videos, flyers, graphics



PTRC
Sustainable Energy



Stand: CN5
Hall: Concourse

Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions

The Aquistore CO2 storage project is the largest industrial scale facility in the world for the testing and proving of measurement, monitoring and verification technologies for long-term storage of carbon dioxide. This important facility, which began operation in 2015 when the first CO2 was injected from SaskPower’s Boundary Dam CO2 capture plant (the first in the world to capture off a coal-fired power station) has developed into one of the most important CO2 storage test centres, helping mining companies, refineries, enhanced oil operators, cement manufacturers, and power stations understand the storage technologies required to store their emissions. The PTRC – operator of the facility – has assisted dozens of companies and governmental agencies develop and adapt existing monitoring technologies, test new technologies, and develop regulator guidelines for the safe geological storage of CO2. Total CO2 storage at Aquistore has surpassed 5530000 tonnes

How does your decarbonisation-related product, process or solution benefit the industry or users?

The repurposing of existing measurement and monitoring technologies for CO2 requires real operational experience of a CO2 injection and storage facility with industrial-scale volumes of CO2 to provide real time, continuous operating data. Aquistore has helped purveyors of existing technologies – and, indeed, the developers of new and innovate technologies like fibre optics – optimize their use for CO2 storage and monitoring, allowing for MMV across different large industrial set-point emitters.

Please provide any examples of how your decarbonisation-related product, process or solution has been used in the field and what sort of impact it has or can have.

Utilizing the Aquistore field site has impacted directly the following companies:

•The Japan Organization for Metals and Energy Security (JOGMEC) in the development of its Accurately Controlled Routinely Operated Signal System (ACROSS) through the installation of the technology directly above the Aquistore CO2 plume. ACROSS devices have been installed in several locations globally.

• Several fibre-optic technology providers (Silixa, Schlumberger, Weatherford) have tested and optimized their signal recorders over successive seismic shoots comparing results with those recorded by the permanent array.

Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions

Following the call of the Head of State Tokayev K.K. to achieve carbon neutrality by 2060 and the implementation of the national strategy for low-carbon development, our “QazMunayHim” team, represented by our subsidiary “Qazaqstan Ormany”, is successfully developing an environmentally efficient and unparalleled in the CIS countries nursery with a greenhouse complex with a total area of up to 485 hectares in the green belt near Astana. In the coming years the nursery will cover the need for tens of millions of seedlings and saplings for reforestation and urban greening in Kazakhstan and will be an important element of support for organizations’ efforts to implement the low carbon development program.

How does your decarbonisation-related product, process or solution benefit the industry or users?

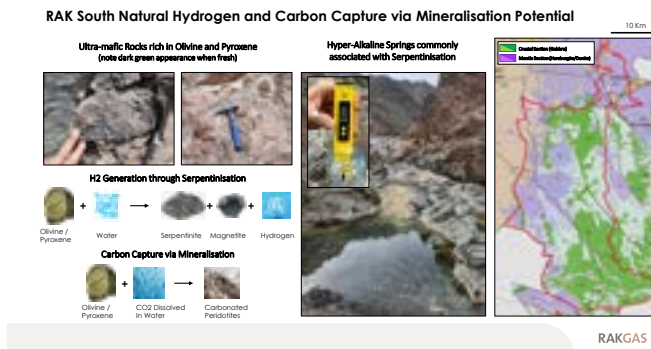
The nursery creates opportunities for economic growth by developing new industries related to plant cultivation, greenhouse construction, and landscaping services. This generates jobs and stimulates local economies. Local production of planting materials enhances supply chain resilience by reducing dependence on external suppliers and ensuring a steady and reliable source of plants for various applications.

Please provide any examples of how your decarbonisation-related product, process or solution has been used in the field and what sort of impact it has or can have.

The nursery with greenhouse facilities indicates a modern and controlled environment for cultivating trees, enabling year-round production. The use of greenhouse technology allows for precise control of temperature, humidity, and irrigation, resulting in optimized plant growth and reduced water usage. Automated shading systems contribute to the efficient use of natural light, minimizing energy consumption.

How will you be promoting your decarbonisation efforts at ADIPEC 2023?

Engaging with attendees and industry experts through networking sessions, one-on-one meetings, and informal discussions can help us connect with potential collaborators, clients, and investors interested in decarbonization efforts.



Stand: 7132
Hall: 7
www.rakgas.ae

Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions

RAK Petroleum Authority (RAKPA) is working with leading advisors to create the regulatory and commercial framework to attract investors for Natural Hydrogen and Carbon Capture via Mineralisation (CCM) pilot exploration project(s) in the Emirate and to look at the feasibility of such projects and the extraction and storage potential.

In the South of RAK lies a large massif of ultra-mafic rocks (rich in olivine and pyroxene minerals) that have the potential to generate significant quantities of naturally occurring hydrogen through a hydrothermal alteration process known as serpentinization.

RAK South is also a candidate for carbon capture applications. The injection of captured CO2 and water into ultra-mafic rocks is an emerging technology referred to as CCM that also has significant potential in the area.

How does your decarbonisation-related product, process or solution benefit the industry or users?

Natural Hydrogen if found in significant quantities could be amongst the greenest fuels, with only limited requirements for additional water or external energy to produce, making it both clean and environmentally friendly.

CCM is an emerging new technology which, if demonstrated to work at scale, could be a game-changer for CO2 reduction. Future pilot studies will need to determine injectivity rates and whether the full process including CO2 capture at source, transport and injection can be upscaled at costs supported by future carbon pricing mechanisms.

Please provide any examples of how your decarbonisation-related product, process or solution has been used in the field and what sort of impact it has or can have.

Natural Hydrogen Exploration is in its infancy however multiple projects are currently receiving attention (and funding) globally. The world’s first dedicated natural hydrogen exploration wells have been drilled in the Midwest USA and a successful hydrogen exploration round was recently held in South Australia.

CCM has been proven to work in mafic rocks (basalts, with lower quantities of olivine and pyroxene) in both Iceland and the USA. We are also watching with interest the ongoing pilot announced by 44.01 and Masdar in Fujairah within the same geology as RAK South.



Stand: 12235
Hall: 12
www.uk.reidlifting.com

Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions

In line with our dedication to corporate responsibility and aligning with the UK’s ambitious goal of achieving a 68% reduction in emissions by 2030, we are committed to decarbonizing our operations. Our primary focus is on improving the efficiency of our products to decrease annual carbon dioxide emissions. This commitment is reinforced by close collaboration with stakeholders and shareholders, and it encompasses various aspects such as utility management, transportation and many others.

How does your decarbonisation-related product, process or solution benefit the industry or users?

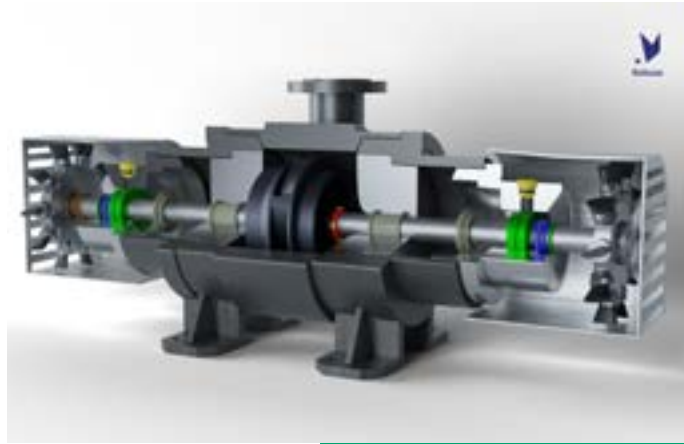
Our decarbonization efforts are exemplified in the water and wastewater sector, where our lightweight and portable lifting solutions have revolutionized maintenance operations. They reduce the need for heavy machinery, minimize downtime, and eliminate the requirement for permanent installations, thus conserving resources.

Please provide any examples of how your decarbonisation-related product, process or solution has been used in the field and what sort of impact it has or can have.

Our journey towards decarbonization has already achieved significant results. We’ve improved heating cycle efficiency by 35%, reducing gas consumption and pump operation times. Streamlining operations by eliminating the Fettling process has further reduced carbon emissions. Supply chain enhancements, like reduced drop-off and pick-up frequencies and an efficient route for aluminium extrusions, have played a pivotal role. Notably, we’ve achieved a 38% reduction in aluminium off cuts, leading to reduced resource waste. We’ve also minimized paper consumption by transitioning to digital wage slips and customer purchase orders.

How will you be promoting your decarbonisation efforts at ADIPEC 2023?

At ADIPEC 2023, we aim to showcase how our portable lifting appliances can significantly enhance organizational efficiency, reducing waste and carbon footprints while optimising asset utilisation.



Stand: M20
Hall: Manufacturing & Logistics

Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions

Decarbonize Faster with Industrial 3D Printing and Leverage API 20T Guidance. In the quest to reduce carbon emissions and promote sustainability across industries, 3D printing, or additive manufacturing components for valves, pumps, compressors, and generators according to API 20T, has emerged as a transformative technology. Traditional manufacturing processes are known for their resource-intensive and environmentally impactful nature. Key contributors to their carbon footprint include: Material Waste: Conventional manufacturing methods often involve subtractive processes, where raw materials are cut, shaped, and molded to create products. This generates significant material waste, increasing resource consumption and waste disposal challenges. Energy Intensity: Many traditional manufacturing operations, such as metal casting and machining, require substantial energy inputs, often derived from fossil fuels. This results in emissions of greenhouse gases, contributing to climate change. Transportation Emissions: The global supply chain for manufactured goods relies on long-distance transportation, leading to substantial carbon emissions from shipping and logistics. Waste Disposal: Traditional manufacturing generates not only product waste but also waste associated with the disposal of hazardous materials and end-of-life products.

How does your decarbonisation-related product, process or solution benefit the industry or users?

3D Printing: A Paradigm Shift for Sustainability 3D printing represents a profound shift in manufacturing approaches, offering significant advantages for decarbonization: Material Efficiency: 3D printing is additive in nature, meaning it adds material layer by layer, reducing waste. This precision minimizes material consumption, particularly valuable for expensive or specialized materials. Localized Production: 3D printing can be done on-site or near the point of use, reducing the need for long-distance transportation and emissions associated with shipping. Energy Consumption: While 3D printers require energy, their efficiency can surpass traditional methods. Eliminating energy-intensive machining processes and printing complex shapes as single pieces contribute to energy savings. Customization and Optimization: 3D printing enables highly customized and optimized designs, leading to energy-efficient products. For instance, lightweight components in the automotive industry enhance fuel efficiency and reduce emissions. printer at the show to explain and digital warehousing software



Stand: 15318
Hall: 15
www.sarens.com

Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions

SGC-90-THE INNOVATIVE GREEN CRANE Sarens Giant Electric crane (SGC-90) can be connected to the electric grid and be fully powered without a traditional fuel source. Uniquely, the Little Celeste can even produce its own energy, recovering and reusing the electricity it generates each time it lowers a load. When connected to the national grid, it recovers all produced energy and feeds it back, reducing energy consumption by up to 40%. Because it runs on electricity, the SGC-90's operation is very silent. It is energy-efficient and environmentally friendly, emitting no exhaust and posing no oil contamination hazards. Finally, the crane is maintenance-friendly and reliable, with no hydraulic pumps, filters, or engines. Other green equipment indyected in the fleet - All of the new cranes purchased for our fleet are either hybrid or equipped with engines compliant with the latest emissions standards. Added over 80 all-terrain cranes that meet the latest EUROMOT Stage V standards. Each new truck to join our European fleet complies with the latest EURO 6 emissions standards. Ordered 24 all-terrain cranes from Tadano for operations in Belgium, Netherlands, France, Poland, UK, and Australia. Also ordered six E-Packs for use with the AC 3.055-1 and AC 4.080-1 cranes. Added six Spierings battery-powered hybrid mobile tower cranes – Three SK1265-AT6 eLift & three SK597-AT4 eLift cranes. Three Grove GMK5150L added to strengthen our presence in the wind energy sector in Canada. • Sarens is incentivizing manufacturers to offer electrical options for new cranes and to offer retrofit conversions for larger crawler cranes. Research is currently underway for a new SPMT E-PPU option.

How does your decarbonisation-related product, process or solution benefit the industry or users?

Sarens green equipment are now working on most of its project considerably reducing our carbon footprint. Along with that Sarens is progressively shifting from coal projects towards waste & energy plant projects. A significant volume of our work today is with clients in offshore/onshore wind, nuclear, and hydrogen. So far we have installed over 1.000 wind turbines and continue to do more each day. Some of the key green projects Sarens worked in 2022 are: Marshalled 62 largest monopiles ever to be handled in the UK / Handled 71-gravity based structures at the Fécamp offshore wind farm / Replaced steam generators at Watts Bar Nuclear Plant in Tennessee/ Installed first prototype of the innovative Sea wing / harnesses wind energy to propel commercial sea-vessels / Assembled Sea green offshore wind-jackets in China / At sub-zero temperature, installed highest Vestas wind-turbines in Belarus.



Stand: 7613
Hall: 7

Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions

SeekOps® couples its industry-leading sensor technology with autonomous enterprise-grade drones to provide field-proven measurement systems for methane Leak Detection and Quantification (LDAQ™). Our award-winning sensor technology, SeekIR®, provides critical ESG emissions Measurement Reporting and Verification (MRV™) to meet stringent OGMP 2.0 and MiQ certification requirements for onshore and offshore energy operators, as well as renewable natural gas and waste management customers around the world, as they continue on their path to Net Zero.

How does your decarbonisation-related product, process or solution benefit the industry or users?

In order to meet OGMP 2.0 guidelines, companies must demonstrate comprehensive top-down emissions measurement for their facilities. SeekOps and their drone-mounted sensors enable full quantification of all emissions, as low as 0.02kg/hr, for operators around the world, both onshore and offshore. Emissions are also localized to equipment-level detail, providing further context to operators rather than a simple site-wide measurement.

Please provide any examples of how your decarbonisation-related product, process or solution has been used in the field and what sort of impact it has or can have.

SeekOps is being employed across 6 continents to provide top-down, direct measurement of methane emissions by major international and regional E&P companies as part of their OGMP 2.0 certification programs, as well as local regulatory reporting and ESG-driven initiatives. SeekOps trains local drone service partners to deliver surveys for each operator using local knowledge and expertise, while providing actionable data for leak repair and remediation.

How will you be promoting your decarbonisation efforts at ADIPEC 2023?

Yes, SeekOps is exhibiting in the US Pavilion at stand 7613.

Türkiye



Stand: 11101
Hall: 11
www.selten.com

Climate change is recognized as one of the biggest problems encountered on a global scale, affecting all countries regardless of their level of development and without borders. The Mediterranean basin, in which our country is located, is seen as one of the most vulnerable regions against the negative effects of climate change. Our country has already begun to be affected by the reduction of water resources and desertification caused by climate change. The fight against climate change is not only perceived as an environmental problem, but the transition to a low-carbon economy at a global level envisages a radical change in people's lives by shaping the growth strategies, energy policies, health policies, agricultural policies, food security and sustainable development goals of countries.

The energy sector, which is an emission-intensive and resource-intensive sector, will be one of the sectors that will be most affected by the regulations brought or to be brought by these agreements. In this context, our country is determined to use its energy resources effectively, efficiently and with the least impact on the environment, within the framework of sustainable development goals.

By giving due importance to renewable resources in energy production, which is the main input of development, and by evaluating our mines in accordance with environmental standards, we both fulfill our responsibilities in the field of environment and ensure our energy supply security. Our Ministry closely follows the environmental studies carried out at national and international level and thus contributes to our sustainable development goals. In addition, our Ministry is responsible for calculating the emissions from Electricity and Heat Production of the National Greenhouse Gas Emission Inventory, which is prepared to show transparency in the fight against climate change. In addition, in order to be used in the calculation of Greenhouse Gas Emission reductions by the use of renewableenergy, etc.; Turkish National Electricity Grid Emission Factor is published by our Ministry. Also, Turkish Electricity Production and Electricity Consumption Point Emission Factors, which enable corporate companies to calculate Scope 2 greenhouse gas emissions originating from electricity consumption, are published by our Ministry.

To reach 2050 zero carbon target, Turkish Ministry of Energy works in all sectors. Every year a serious improvement is going on.

Source: Republic of Türkiye Ministry of Energy and Natural Resources - (enerji.gov.tr)



Stand: 14140
Hall: 14
www.sensiaglobal.com

Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions

Throughput Optimization – Thermophysical properties embedded directly into operational PLC providing additional visualization and closed loop control, in real time. CCS – Full value chain solutions for CCS - Scalable modular integration system, supported by Integrated Control and Safety System with pre-configured metering, and dehydration reinforced by comprehensive data management System SWINTON – Integrated CO2 & Methane Totalization

How does your decarbonisation-related product, process or solution benefit the industry or users?

Throughput Optimization – An edge based control system with direct control of PLC into removing the need for gateways or OPC’s and reducing layers to optimization and decarbonization. CCS – Senisa Leverages products and solutions and expertise from 3 world renowned companies Rockwell Automation, slb and Sensia. SWINTON – using flow weighted composition of flue gas calculates total carbon contents and reports CO2 mass for streams and station totalization to comply with regulatory reporting requirements.

Please provide any examples of how your decarbonisation-related product, process or solution has been used in the field and what sort of impact it has or can have.

Throughput Optimization - Ensuring hydrate approach temperatures come within determined limits. 96% reduction in duty cycle - Reduction of temperature to optimize NGL recovery in reboiler, 15% duty cycle. Process Accurate calculation of required hydrate inhibitor with 68% reduction in methanol use. CCS – CCS is a key enabler of emissions reductions and Sensia’s existing solutions, operating in the field are easily transferable to the Carbon Capture space. SWINTON – Currently calculating total carbon contests from offshore and onshore assets for gas receiving terminal.

How will you be promoting your decarbonisation efforts at ADIPEC 2023?

We will have an ADIPEC webpage on our website and we will be showcasing our solutions and sustainability strategy at the booth.



Stand: 8450
Hall: 8

Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions

The Energy Transition Databox is a software enabled engineering service that provides verifiable and auditable emissions data for companies and their supply chains.

How does your decarbonisation-related product, process or solution benefit the industry or users?

Databox combines world-class engineering expertise and secure data sharing technology to ensure the acquisition, reporting and analysis of emissions data used by our clients to make key decisions and justifications is fully traceable, verifiable and secure. It provides trusted data that enables them to comply with environmental regulations, gain access to capital, and uphold their reputation. The solution is uniquely placed to provide verifiable emissions data and actionable decarbonisation outcomes by combining decades of emissions assurance with industry leading data sharing technology, underpinned by engineering expertise in the energy sector.

Please provide any examples of how your decarbonisation-related product, process or solution has been used in the field and what sort of impact it has or can have.

We have piloted with operators and services companies based in the North Sea and Middle East regions. We are now looking to deploy the solution into production, and explore the applicability of the technology into emerging markets such as CCS and Hydrogen.

How will you be promoting your decarbonisation efforts at ADIPEC 2023?

We will be participating in panels and discussions throughout the week and we look forward to meeting customers and partners to discuss opportunities to collaborate.

We’ll be running live demonstrations of the software and will be showcasing the outcomes of the pilot projects. Come and visit us at the Scottish Pavilion!



Stand: 12210
Hall: 12
www.silverwellenergy.com

Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions

“Silverwell has developed a simple calculator as an industry tool allowing anyone to estimate and quantify Greenhouse Gas (GHG) reduction based on production increase and gas injection reduction for gas lifted wells. It applies to all traditional and surface-controlled gas lifted wells regardless of vendor or specific technology. This suite of a calculator, derivations, and formulas are free for all to use. Silverwell’s goal is leading our mutual industry towards a better understanding of our impact on our world and participating in a cleaner and more sustainable future.”

How does your decarbonisation-related product, process or solution benefit the industry or users?

This simple tool allows any operator to predict how adjustments to a gas lifted well will change GHG emissions. The operator sees how production and gas injection adjustments will reduce or increase Carbon Intensity and thus GHG emissions related to ongoing gas lift operations.

Please provide any examples of how your decarbonisation-related product, process or solution has been used in the field and what sort of impact it has or can have.

In a typical Bahraini application, Silverwell’s DIAL real-time surface-controlled gas lift optimization resulted in an 18% production increase and 25% reduction in gas injected. The Carbon Intensity Reduction Calculator calculates this to be a 36% REDUCTION IN CARBON INTENSITY!

How will you be promoting your decarbonisation efforts at ADIPEC 2023?

“Silverwell will be presenting this technology in Silverwell’s booth which is shared with EuroMechanical. This presentation schedule has yet to be formalized.

Detailed information is also available on Silverwell’s website.

Calculator:
<https://www.silverwellenergy.com/dials-contribution-to-sustainability-in-the-oilfield>”



Stand: 11312
Hall: 11
www.soluforce.com

Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions

SoluForce offers high pressure flexible Reinforced Thermoplastic Pipe (FCP or RTP) systems. As originator and technological leader, SoluForce is used for a variety of applications in hydrocarbon, water, mining and hydrogen industries. Such as high pressure flowlines, water injection, gas transport, mining and hydrogen.

They are completely non-metallic, maintenance-free and without scaling, corrosion or embrittlement. All while being certified according to multiple international standards. The SoluForce RTP system is efficiently produced, quick and easy to deliver and install, has at least 30% lower TCO and 4x lower CO2 footprint compared to alternatives. Thus significantly decarbonizing operations of our customers.

How does your decarbonisation-related product, process or solution benefit the industry or users?

With over 4.000 km of SoluForce FCP installed around the world in on- and offshore applications, our customers have been benefitting from our reliable solutions, know-how and experience since the year 2000.

How will you be promoting your decarbonisation efforts at ADIPEC 2023?

We will be part of the Netherlands Pavilion with our own booth.



Stand: 3370
Hall: 3

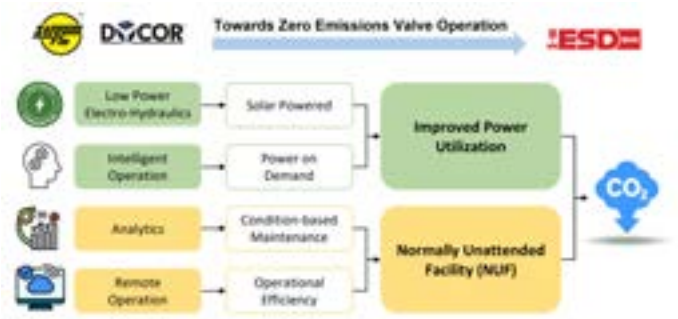
StimStixx presents a Safer, Cleaner, Greener matrix acidizing solution which uses patented technology to clean wellbore perforation intervals for increased effectiveness and accuracy. StimStixx unique stimulation technology requires less manpower and equipment, potentially reducing CO2 emissions up to 90%

Unlike conventional acid deployment methods, StimStixx’s stimulation acid is not delivered to the formation in a liquid form. Instead, hot acid vapor is generated downhole under pressure at the zone of interest via the ignition of chemicals contained within our tools which is then rapidly converted to hydrochloric acid in-situ. StimStixx’s unique stimulation technology requires less manpower and equipment, potentially reducing CO2 emissions by up to 90% when compared to traditional bull-heading and coil tubing applications.

- A key technical advantage of generating an acid gas downhole is related to the fact that a gas can have an effective permeability of up to 10 times higher than a liquid.
- A key problem with conventional liquid acid systems is the stabilization of the acid during the application so as to minimize its interaction with wellbore tubulars. Generating an acid gas downhole can therefore eliminate the need for inhibition chemistry and tubing pickling, thus preserving the acids activity and reducing the potential for washing debris from the tubing into the perforations.
- The StimStixx technology comes in standard HCL and a HCL/HF blends in line with conventional liquid treatment ratios.
- The deployment of StimStixx technology only requires one or two-man crew who work with e-line, slickline or wireline.

StimStixx has multiple case studies that consistently demonstrate productivity enhancements of a 100% or greater over extended periods of time in both onshore and offshore environments.

We’ll be running a presentation explaining the advantages of our unique stimulation technology.



Stream-Flo
Industries Ltd.

Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions

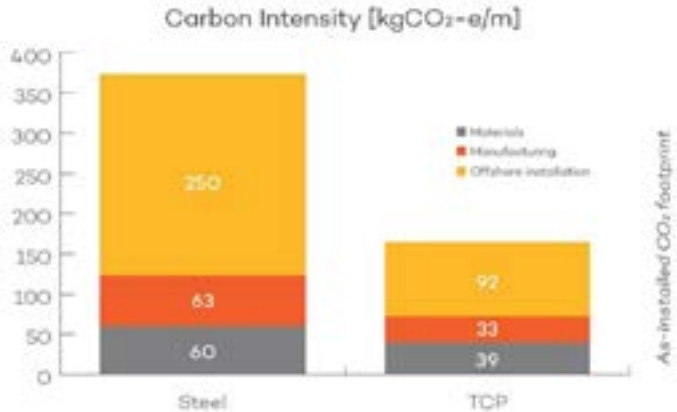
Valves are critical components in the oil and gas industry from up-stream to down-stream supply chains that control operation, while protecting lives and assets. Many of the valve operations involve manual intervention and/or powered by process line pressure. This requires field transportation and site equipment utilization and/or process gas venting leading to increased greenhouse gas (GHG) emissions. At Stream-Flo Group of Companies, a smart actuated emergency shutdown (ESD) valve has been developed, which is composed of two modular components: (1) a self-contained low power electro-hydraulic system (ESD-EH) and (2) an intelligent valve control system (ESD-EHX). The smart ESD system can reduce GHG emissions through improving power utilization and establishing a normally unattended facility (NUF). Low power electro-hydraulics combined with intelligent operation using edge computing contribute to the improved power utilization. On the other hand, analytics through edge processing of smart algorithms provides an insight of the health of the valve and its control system. This leads to improved protocols through condition-based rather than preventive maintenance, while avoiding unscheduled outages. In addition, remote operation through cloud/IIOT protocols and PLC/DCS interfaces improves operational efficiency through real-time global accessibility. Both analytics and remote operation are major drivers towards achieving an NUF, which according to the international oil and gas producers (IOGP) support the reduction of GHG emissions.

How does your decarbonisation-related product, process or solution benefit the industry or users?

The hybrid edge-cloud control and monitoring system of the smart ESD has several benefits. The edge computing provides responsiveness, security, and reliability, while the cloud interface provides remote control, data storage, and multi-site accessibility. This does not only contribute to decarbonisation, but also improves overall production reliability and reduce operating costs, thus solving the industry’s energy trilemma.

Please provide any examples of how your decarbonisation-related product, process or solution has been used in the field and what sort of impact it has or can have.

The ESD-EH has been implemented by major energy producers to minimize personnel field presence and allow remote operation during cold winter temperatures approaching -40 C and hazardous wildfire conditions.



Strohm

Stand: 11212
Hall: 11
www.strohm.eu

Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions

TCP reduces the carbon footprint of your pipeline The industry is moving to reducing the CO2 footprint of their operations, with some major operators moving further, to include the CO2 footprint of the full life cycle of their product, also known as “net zero”. To support the industry, Strohm is reducing the CO2 footprint related to our TCP product across the life cycle.

How does your decarbonisation-related product, process or solution benefit the industry or users?

The CO2 footprint related to our company is considered in three scopes. In scopes 1 and 2, Strohm has already made significant gains in reducing our CO2 footprint, with all electricity used during manufacture being 100% certified green energy. We assess scope 3 in the context of our product moving through the different stages in its life cycle: Ex-Works footprint, As-Installed footprint, and Life Cycle footprint. When considering the Ex-Works and As-Installed footprints, we see that TCP has the potential to reduce the CO2 footprint of a pipeline by more than 50%. With the added benefit of zero maintenance intervention, the life cycle benefits on CO2 footprint increase further. A typical installation case in West Africa, based on a field-proven TCP installation and comparing to steel, shows that a CO2 reduction of 50% or more is achievable.

Please provide any examples of how your decarbonisation-related product, process or solution has been used in the field and what sort of impact it has or can have.

In Strohm we are certifying our footprint assessment with the aim to provide our clients with a fully certified CO2 footprint assessment. On individual projects this is already available.



Técnicas Reunidas’
strategy for the
decarbonisation

track
TECNICAS REUNIDAS

Stand: 4256
Hall: 4

www.tecnicasreunidas.es

Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions

Técnicas Reunidas (TR) provides engineering and construction services for large and complex energy facilities. As the energy industry is moving to a decarbonized supply of energy, TR is shifting too, providing full engineering and EPC services in the hydrogen value chain (including e – methanol and green & blue ammonia), sustainable fuels and carbon capture. On top of that, TR has launched TRACK, its strategy for providing additional value to our customers in their decarbonization efforts through the delivery of early stage engineering services, project development, carbon management (carbon capture as a service) and methane management.

How does your decarbonisation-related product, process or solution benefit the industry or users?

TRACK’s engineering services help to shape and optimize the business cases for decarbonization investments; project development builds decarbonization investable opportunities for industrial and infrastructure investors; carbon management provides an end to end service to support the decarbonization efforts of hard to abate emitting industries; methane management establishes frameworks for methane leakages identification, measurement, mitigation and reporting.

Please provide any examples of how your decarbonisation-related product, process or solution has been used in the field and what sort of impact it has or can have.

TRACK’s engineering services have helped infrastructure funds to define at FEL3 stage large hydrogen plants, or industrial players to shape big blue and green ammonia projects, or established oil and gas operators to select the most adequate carbon capture technology and supported the deployment of HVO or SAF investments. track is already developing a second generation bioethanol plant from forest and agricultural waste and a green ammonia plant in Spain.



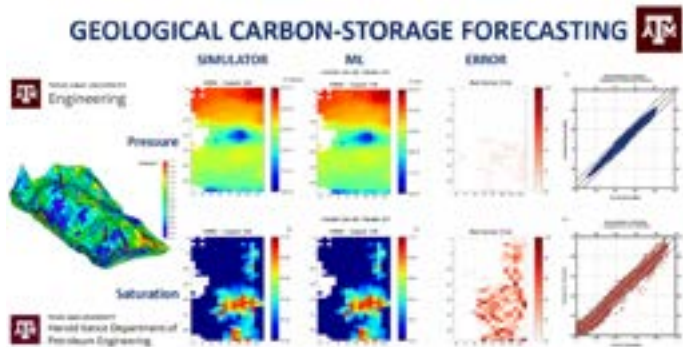
TELEDYNE GAS AND FLAME DETECTION
Everywhere you look

Stand: 9413
Hall: 9

www.teledynegasandflamedetection.com



Stand: 1370
Hall: 1



Texas A&M
University
www.engineering.tamu.edu

We're out of time.
Not Options.

TGT

#DecarboniseWithDiagnostics

TGT

Stand: 5330
Hall: 5

www.tgtdiagnostics.com

Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions

The Spyglass optical flame detector utilises triple infrared technology for highly effective hydrogen fire detection. It also provides real-time event monitoring via onboard video, enhancing safety during the energy transition. The Gasurveyor 700 H2 assists operators in detecting hydrogen and natural gas leaks as networks evolve, ensuring safe management during conversions and expansions.

How does your decarbonisation-related product, process or solution benefit the industry or users?

Amid the hydrogen energy transition, flame and security solutions play a pivotal role.. Flame detection promptly identifies fire or explosive hazards in hydrogen facilities, preventing harm. Integrating flame detection with gas sensors allows for the continuous monitoring of real-time gas levels, ultimately reducing the risk of accidents. Gas detection systems excel at detecting hidden hydrogen leaks, enabling loss prevention, emissions reduction, and resource optimization.Haut du formulaire

Please provide any examples of how your decarbonisation-related product, process or solution has been used in the field and what sort of impact it has or can have.

The GS700 - Hydrogen supports the UK's transition to a carbon-neutral future by enabling the testing and measurement of hydrogen within gas distribution networks. This device's unique dual measurement capabilities allow it to detect both Natural Gas and Hydrogen, including an accurate measurement of LEL in blended mixtures. Teledyne GMI, a trusted supplier of portable gas detection devices, brings its extensive industry knowledge and customer-focused approach to support ground-breaking developments. Through close collaboration with SGN, NGN and other partners, Teledyne GMI remains adaptable to the evolving requirements of the industry.

How will you be promoting your decarbonisation efforts at ADIPEC 2023?

We will be running product presentations and have a dedicated wall equipped with innovative rear projection glass showcasing our video animations.

Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions

T1 solutions' FoamFlex technology consists of a special hydrophobic and oleophilic polymer which can selectively recover any type of hydrocarbon from water (of high and low viscosity) for about 25 times its own weight. The polymer can be reused, by squeezing, hundreds of times and the oil can be recovered intact (with less than 5% of water) and reintroduced into the production processes. This reusability and recovery of intact oil allow for a strong reduction in waste reclamation and management costs (up to -94%) and the consequent CO2 generated (up to -99%), both thanks to reusability and oil collection. According to a study conducted by Eni S.p.a. , using our polymer, the company can even generate profits during the management of an oil spill, thanks to the economic value of the recovered oil. The ease of use, the ability to repel water and the rapid saturation of the material (a few minutes) make it possible to anticipate weathering phenomena and increase the % of oil recovered from the current 5-20% to over 60%.

How does your decarbonisation-related product, process or solution benefit the industry or users?

Our solution enables industries to significantly reduce their greenhouse gas emissions and carbon footprint. By optimizing energy efficiency and implementing sustainable practices, our technology helps companies transition towards lower carbon operations and align with decarbonisation goals.

Please provide any examples of how your decarbonisation-related product, process or solution has been used in the field and what sort of impact it has or can have.

One important example of intervention was in 2018 when Emma hurricane caused a 150-ton oil spill in the port of Gran Tarajal (Canary Island). With 70 kg of FoamFlex, two hand wringers and 8 unskilled operators, 55% of the spilled oil was collected and 57 tons were made reusable in 3 days (water presence <5%). At the same time, a skimmer operated by skilled operators collected 0.5 tons of oil with 50% water.

Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions

Carbon sequestration can reduce CO2 emissions, but forecasting with numerical simulators is time-consuming. We introduced neural operator and transfer learning for quicker CO2 pressure plume and saturation forecasting under varying geological and operational conditions. Using Fourier Neural Operator (FNO), forecasting time dropped from 40-50 minutes to 12 seconds. Implementing transfer learning further reduced it to 8 seconds. While the mean relative errors were 1.42% for pressure and 7.9% for saturation, these increased slightly with transfer learning due to less data and reduced training time. However, transfer learning cut data generation and training times by 50% and 75% respectively, with 99.9% fewer trainable parameters. This approach enhances CO2 forecasting efficiency and can mitigate associated risks.

How does your decarbonisation-related product, process or solution benefit the industry or users?

In this work, we have demonstrated the application of transfer learning to predict CO2 saturation distribution and pressure plume under uncertain geological and operational conditions. We generated two different datasets, one for the source task and the other for the target task, for demonstrating the benefit of neural operators and transfer learning in CO2-storage forecasting. The CMG forecasting time for one scenario requires approximately 40 to 50 minutes, which was drastically reduced to 12 seconds by using Fourier Neural Operator and then reduced further to 8 seconds by implementing transfer learning on the Fourier neural operators. This is a significant improvement that could make CO2 forecasting more feasible for real-world applications.

Please provide any examples of how your decarbonisation-related product, process or solution has been used in the field and what sort of impact it has or can have.

Using transfer learning and Fourier Neural Operators, we enhanced CO2 forecasting under varied geological and operational conditions. Two datasets were created for source and target tasks. CMG forecasting time, originally 40-50 minutes, plummeted to 12 seconds with Fourier Neural Operator and further to 8 seconds with transfer learning. This leap boosts real-world CO2 forecasting feasibility.

Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions

TGT has developed twenty effective diagnostic answer products that can each lead to a significant reduction in upstream emissions and carbon-per-barrel. Our diagnostics help operators by revealing inefficiencies in energy-intensive operations and locating sources of greenhouse gas.

How does your decarbonisation-related product, process or solution benefit the industry or users?

There are seven distinct areas where our diagnostics can be utilised to improve efficiency and reduce emissions:

- Energy & resource efficiency
- Reduce methane emissions
- Reducing oil spills & pollution
- Reduce flaring
- Water management
- Cleaner energy
- Carbon capture & storage

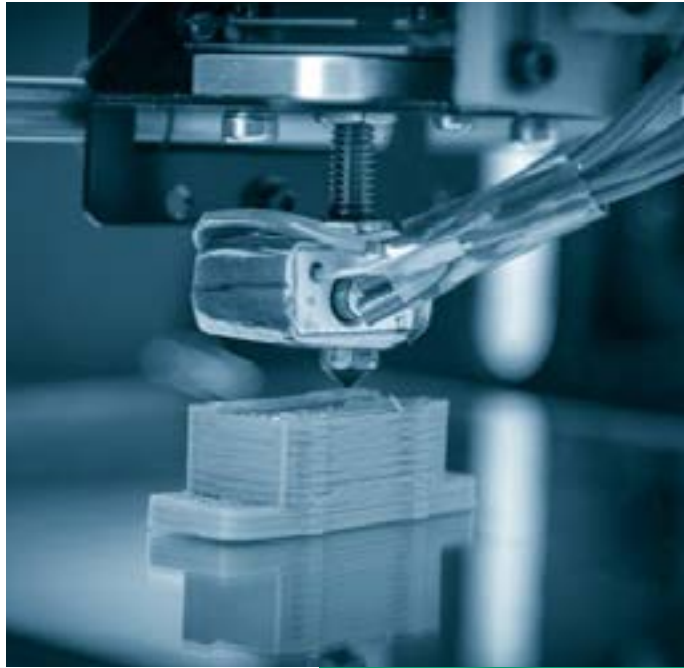
Please provide any examples of how your decarbonisation-related product, process or solution has been used in the field and what sort of impact it has or can have.

A gas lift producer had been shut in due to sustained annulus pressure and excessive volumes of hydrogen sulphide (H2S). The operator wanted to assess primary barrier integrity and guide a workover program.

Our diagnostics revealed leaks in all four gas lift mandrels and an active crossflow between the perforated intervals in this well. A workover operation returned the well to H2S-free production with an increased oil rate and reduced water cut and delivered important safety and environmental benefits.

How will you be promoting your decarbonisation efforts at ADIPEC 2023?

We will have on-stand presentations on Decarbonise with diagnostics and how our answer products can help operators achieve their net-zero targets today



Stand: MI31
Hall: MI

3D printing plays a significant role in contributing to the decarbonization of the oil and gas industry through several key mechanisms:

Efficient Part Manufacturing: Traditional manufacturing processes in the oil and gas sector often involve machining and casting, which can be energy-intensive and generate substantial waste. 3D printing allows for the production of complex, customized components with minimal material waste, reducing the energy required for manufacturing and the carbon footprint associated with waste disposal.

Lightweight and Advanced Materials: 3D printing enables the use of lightweight and advanced materials, such as carbon fiber composites, that are not only stronger but also lighter than traditional materials. This leads to lighter equipment and structures, which require less energy to transport and operate, thus reducing overall emissions.

On-Demand Parts: The oil and gas industry relies on a vast infrastructure that requires regular maintenance and replacement parts. 3D printing can provide on-demand production of these parts, reducing the need for large warehouses and long-distance shipping, resulting in lower carbon emissions from logistics.

Energy Efficiency: Some 3D printing processes, like powder bed fusion, can be more energy-efficient compared to traditional manufacturing techniques. Moreover, advancements in 3D printing technology continue to improve energy efficiency, aligning with decarbonization efforts.

Design Optimization: 3D printing allows for intricate geometries and designs that were previously impossible or expensive to manufacture. This can lead to more efficient equipment and structures, reducing the energy consumption and emissions associated with oil and gas operations.

Reduced Exploration Impact: 3D printing can be used to fabricate models and prototypes for oil and gas exploration, reducing the need for physical drilling and minimizing the environmental impact of exploration activities.

In summary, 3D printing in the oil and gas industry contributes to decarbonization by reducing energy consumption, material waste, and emissions associated with manufacturing and operations. It also enables the industry to adopt more sustainable practices, optimize designs, and increase efficiency, all of which are critical steps in reducing its carbon footprint.



TLV International, Inc.
Japan

Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions

The proposed novel methodology is a Steam System Optimization Program (SSOP) that is designed as a continuous, annual cycle rather than a one-time optimization process, ensuring sustained improvements in the steam system's reliability, energy efficiency, and environmental performance.

The SSOP follows a systematic six-step methodology, starting from the establishment of a plant-specific steam system database to Consultation and On-site Surveys, data analysis, recommended improvements, and ending with data updates. The program emphasizes the importance of understanding the entire steam system, including steam generation, distribution, applications, and condensate discharge, to draw a clear picture of the current status and potential obstacles for optimization.

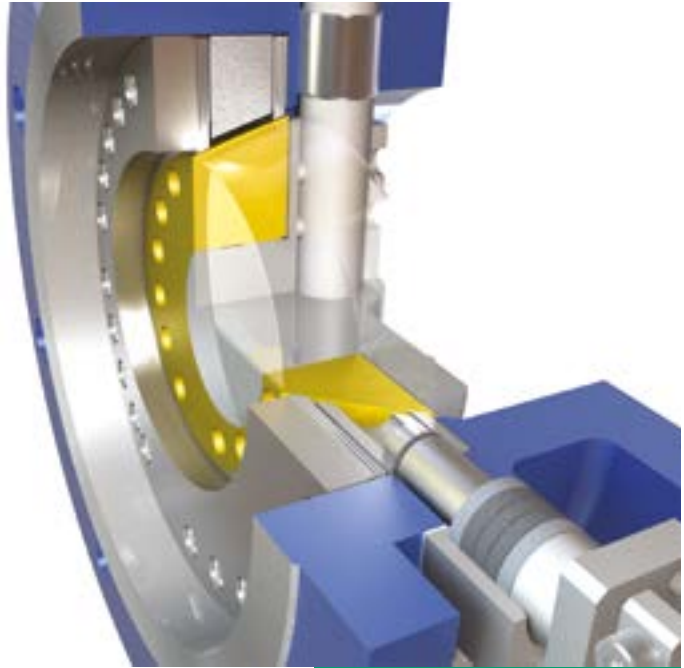
How does your decarbonisation-related product, process or solution benefit the industry or users?

The program outputs or benefits can be expressed in various ways, firstly, reductions in steam generation, which attributes to the plant's energy efficiency improvement. Secondly, benefits can be expressed as monetary savings and that number matters to the plant management, since the main goal is to keep the plant working with minimal expenditures.

The program was applied to over 220 Japanese plants across different industries, including approximately 48 refineries and petrochemical plants. A significant average reduction of 562,000 tons of CO2 emissions per year was achieved by decreasing steam generation by 3.85 million tons annually. This resulted in substantial monetary savings of \$77 million USD each year.

Please provide any examples of how your decarbonisation-related product, process or solution has been used in the field and what sort of impact it has or can have.

The aforementioned steam generation reduction resulted in an approximate yearly carbon emission reduction of 652,000-ton CO2/year. The carbon footprint for SSOP yearly average carbon emissions reduction is 125,385 hectares per year, in other words if that reduction wasn't achieved, the area of forest that could have absorbed the emitted CO2 would have been 125,385 hectares or 1253.85 square kilometers of forest, that area is more than half the area of Tokyo "Japan's capital metropolitan city"



Stand: 12235
Hall: 12
www.tomoevalve.com

What did your decarbonisation effort entail?

We needed to produce a valve that complied with ISO 15848. Tomoe Valve Ltd achieved qualification to ISO 15848 Class BH in April 2006 and recently added qualification to ISO 15848 Class AH in June 2023. This is a measurement, test and qualification procedure for fugitive emissions.

What was the goal of your decarbonisation effort?

To control the leakage rate through the valve stem of our Triple Offset Butterfly Valves. For Class BH this means we can produce a valve that only allows a leakage rate through the stem seal of equal to or less than 3.14×10^{-7} of helium measured using a mass spectrometer. For Class AH, this allows a leakage rate through the stem seal of equal to or less than 3.14×10^{-8} of helium measured using a mass spectrometer.

What has been the impact of your decarbonisation effort?

Allows our range of Triple Offset Butterfly Valves to be used in Low Emission services. This qualification can be extended to the following stem sizes and pressure classes. Stem sizes qualified 25mm – 100mm. Pressure Classes qualified 150Lb, 300Lb & 600Lb. The valve operating temperature is between ambient/+200°C.



Stand: 1252
Hall: 1
www.trilliumflow.com

Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions

At Trillium, reducing carbon emissions begins by providing energy-efficient equipment. We offer for example pumps with CFD-optimized hydraulic components used as Hydraulic Power Recovery Turbines that contribute to total plant energy recovery.

We also provide customized upgrades and rerates for existing pumps. We re-rate hydraulic components, re-design mechanical components, install speed control devices, and modify/replace complete pumps. Our solutions are easy to implement, reduce energy consumption, lower maintenance costs, and decrease carbon emissions at the pump system and plant level.

How does your decarbonisation-related product, process or solution benefit the industry or users?

Today, plant operators need suppliers that provide equipment solutions increasing their productivity and energy efficiency while reducing carbon emissions. With its innovation orientation and extensive portfolio of pumps, valves, and services, Trillium can help improve upstream, midstream, or downstream operations in all these areas.

Please provide any examples of how your decarbonisation-related product, process or solution has been used in the field and what sort of impact it has or can have.

Trillium executed the re-rate of API 610 BB5 multistage pumps performing MOL service at an offshore platform to fit new plant requirements. At the new duty flow rate, the re-rated MOL pumps demonstrated a 24% efficiency increase, 40% power consumption reduction, and improved MTBF. At plant level, this translated into reduced energy costs of -10.5 GWh per year, equivalent to 2.4 M\$ savings per year, increased plant availability, and reduced CO2 emissions of -4,400 tons per year.

How will you be promoting your decarbonisation efforts at ADIPEC 2023?

Energy-saving is an integral part of our offering. Our Sales Team will naturally focus on our sustainable solutions with customers at our stand.



Stand: 8858
Hall: 8
www.tuvsud.com

We have booth manned by our global experts who will provide value added advice to the visitors. Additionally, we have arranged presentations on topics such as carbon footprint validation and verification, certification landscape of green and low carbon hydrogen and its derivatives, renewables – a strong option for energy transition, Asset Integrity Management, Process Safety Management, Flare Measurement: How to Lower Emissions and Improve Confidence, Reduce Opex and Capex Spend with Virtual Multiphase Flow Metering etc. to name a few. These sessions would be conducted at our booth by our experts. Necessary information/flyers will also be available.

TÜV SÜD is committed to giving customers the assurance that they are meeting regulatory requirements and have confidence in their investment decisions by delivering accuracy and transparency of greenhouse gas (GHG) accounting and reporting. Ever since its inception 155 years ago, TÜV SÜD has protected people, environment, and assets against technology-related risks. Now, we are driving the decarbonization of industry through innovative solutions, supporting our customers to achieve their goals and be the most sustainable versions of themselves.

Understanding and evaluating the risks and mitigation measures associated with the climate and sustainability arena is vital for investors, operators and other stakeholders since they can pose as a big threat with loss of revenue as well reputation. Another challenge is with regards to credibility, a key component of climate change projects and sustainability commitment. It increases investors and regulators' confidence, as well as public support.

At TÜV SÜD, we provide a better understanding of GHG emission impacts across your business value chain, organizational level and/ or product life cycle by providing independent validation, verification, and assurance services. Our service portfolio helps organisations meet their decarbonisation goals, reduce carbon emissions, and provide validation and verification against relevant certification and safety standards.



Stand: 11212
Hall: 11
www.vh-technologies.nl

Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions

EMA, Electric Hydraulic Actuators for use in the offshore industry, reducing the need for hydraulics and oil, lower power consumption, more efficiency.

By using electro mechanical actuators, there is no need for hydraulic power packs any more. simpler installation, fully electric, more efficient.

Benefits include:

Reduced energy consumption
Energy efficient system design

Save time
No installation time for hoses, piping, cabling, manifolds, hydraulic power unit

Lower costs
Reduced installation & commissioning costs / Less service efforts, reduced life cycle costs / Minimized amount of components

Sustainable solution
Minimized footprint / Reduced CO² emission

H2 Hydrogen compression systems/energy storage
VHT designs and supplies H2 compression systems for various applications and power management systems. Specifically for Fishfarms (100+ installations) the Power Management Systems can give the operator significant gains in efficiency, resulting in lower fuel/ power consumption and les Co2 emissions.

How does your decarbonisation-related product, process or solution benefit the industry or users?

VHT is using its more than 40 years experience with designing and producing large hydraulic cylinder for the H2Direct system. Special attention has been given to the gas seal design so it can withstand the relatively high pressures in the system. Research is underway to use H2 compression for storing energy from offshore windparks, contributing to better efficiency and further decarbonization.

How will you be promoting your decarbonisation efforts at ADIPEC 2023?

During ADIPEC we will have supporting literature and our product leads will be present to speak with you and answer any questions.



Stand: 3150
Hall: 3
www.volantproducts.ca

Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions

Volant CRTi® and CRTe® casing running tools enhance efficiency and reduce rig time. By enabling circulation, rotation, and reciprocation without additional personnel or auxiliary power, we ensure more successful runs to total depth, further cutting carbon emissions. Smaller, simpler, and lighter tools mean reduced logistical resources, minimizing emissions during transportation. By fixing our robust HydroFORM® centralizers directly to the casing string, a device widely used for casing standoff is turned into a powerful solution for managing axial friction when adverse downhole conditions arise. Our centralizers and placement program help land casing at TD reliably and efficiently without compromising wellbore access or casing system integrity. We also designed our Cement Swivel and Plug Launcher tools to provide a quality cement job to ensure uninterrupted zonal isolation and long-term well integrity are achieved. Properly constructed wells with high-quality cement jobs are essential for reducing the risk of hydrocarbon releases.

How does your decarbonisation-related product, process or solution benefit the industry or users?

Our suite of casing running tools, consumables, and digital solutions simplify and reduce the on-site presence of people and equipment, saving time and removing people from harm's way. Our hardware and software solutions ensure adherence to best practices, safeguarding well integrity over its service life. This, in turn, contributes to reduced environmental impacts.

Please provide any examples of how your decarbonisation-related product, process or solution has been used in the field and what sort of impact it has or can have.

Our Light Footprint solution fully mechanical CRTi® and CRTe® casing running tools, introduced in 2005, have revolutionized well construction. By minimizing the need for hydraulic power units, we've substantially reduced carbon emissions. On land, a typical hydraulic tool emits approximately 1.5 tonnes of CO₂ during a 24-hour casing running job. In contrast, our mechanical tools require no auxiliary power, resulting in zero emissions beyond normal rig operations.

How will you be promoting your decarbonisation efforts at ADIPEC 2023?

We will have all the information on these products available with videos on how our tools work together and how our casing running tool runs.



Stand: 9249
Hal: 9
www.vulcanic.com

Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions

Vulcanic specializes in designing and manufacturing electric process heaters and associated control systems, offering decarbonization solutions through electrification. This involves replacing traditional fired heaters with electric ones, significantly reducing carbon emissions.

Electric heaters directly convert electricity into heat energy, which can be sourced from renewables, eliminating the environmental impact associated with burning fossil fuels. Unlike fired heaters, which experience heat loss and inefficiencies through exhaust gases and combustion, electric heaters are highly efficient, minimizing energy waste.

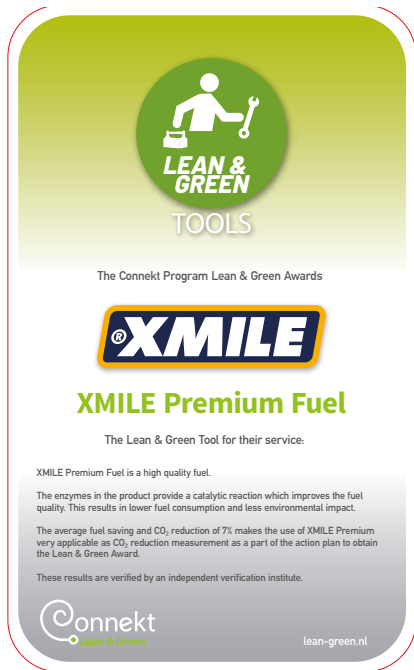
As renewable energy sources become more prevalent and affordable, the carbon benefits of electric heaters will only increase. Fired heaters will continue to rely on a finite and polluting resource.

How does your decarbonisation-related product, process or solution benefit the industry or users?

The advantages of electric heaters include energy efficiency, precise temperature control, ease of installation (without the need for extensive gas infrastructure), lower maintenance requirements, and adaptability to various industrial processes. They align well with decarbonization goals, as they generate heat from renewable sources, resulting in lower carbon emissions. Furthermore, they often face fewer regulatory requirements compared to fired heaters, making them a practical choice for industries. They can be integrated with automation systems, enabling remote control and real-time adjustments and data tracking. Electric heating solutions offer efficiency, sustainability, and environmental benefits, making them a compelling choice for industries aiming to improve operations and reduce their carbon impact.

Please provide any examples of how your decarbonisation-related product, process or solution has been used in the field and what sort of impact it has or can have.

Vulcanic Group has successfully implemented electrification projects in various sectors, such as electrification of district heating facilities in Scandinavia, 20MW capacity heaters in plasterboard production, and spray dryer projects for leading F&B industries.



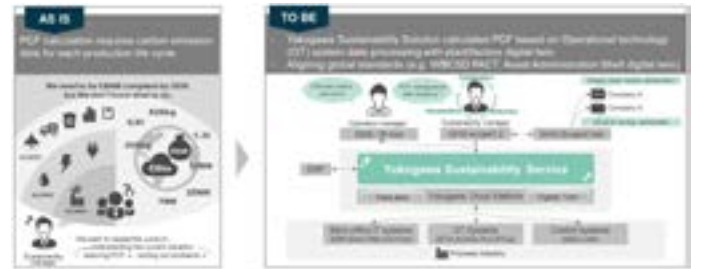
Stand: 12300
Hall: 12
www.xmile.com



Stand: 14476
Hall: 14
www.xplorate.io



Stand: CN10
Hall: Concourse
www.zalux.com



Stand: 14135
Hall: 14
www.yokogawa.com

Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions

Fuels contain many unsaturated molecules which form when crude oil is refined into diesel, gasoline, heavy fuel oil among others. Due to a large amount of these reactive unsaturated molecules, the combustion in engines is not optimal. XMILE's enzyme technology reduces the intermolecular forces between the unsaturated molecules leading to improved combustion, ultimately translating to reduction in consumption and greenhouse gas emissions.

How does your decarbonisation-related product, process or solution benefit the industry or users?

XMILE genuinely solves governments and users' problems in searching, identifying, testing, and adopting effective solutions for decarbonization from now given XMILES's decades long certified track record in reducing fuel consumption and greenhouse gas emissions across different industries and equipment. Such versatility and applicability impacting the entire supply chain from well-to-wheel truly makes XMILE a step closer to obtaining Carbon Credits and meeting a big percentage of carbon reduction targets from now without a need for upfront capital-intensive investment in equipment or upgrades.

Please provide any examples of how your decarbonisation-related product, process or solution has been used in the field and what sort of impact it has or can have.

Our biological fuel additive has been used on Off-Grid Generators (O&G & Powerplants), Marine (Shipping & Construction), Terminals & Fuel Stations. From a financial point of view, usage of XMILE as a biological fuel additive can save users an average of 7% in fuel consumption, reduce maintenance costs (spare parts & consumables) by 20% and provide fuel quality longevity by 300% due to improved oxidation during fuel storage and handling. From an environmental point of view, XMILE as a biological fuel additive can reduce harmful greenhouse gas emissions such as CO₂ by 7% and PM by 35%.

How will you be promoting your decarbonisation efforts at ADIPEC 2023?

The product and decades-long tests & certificates will be showcased on our ADIPEC stand as a testament to our long history in leading the transition towards sustainable fuels. Partnerships with oil companies across the region is what we are targeting to finalize the set-up of the region's first biological fuel additives processing facility for optimal pricing and ICV creation.

Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions

Aerial Intelligence utilising both visual line of sight and beyond visual line of sight drone operations to collect data and produce actionable intelligence reports. Reports include leak detection, visualisation and quantification, Pipeline Integrity and land / vegetation rorting preempting leaks, powerline and distribution network integrity analysis and asset digital twins with fault finding.

How does your decarbonisation-related product, process or solution benefit the industry or users?

Reduces maintenance, preemptively sources issues before causing leaks, reduces in field human requirements for assessment, quantifies leaks in line with OGMP 2.0 standards and provides preventative maintenance planning.

Please provide any examples of how your decarbonisation-related product, process or solution has been used in the field and what sort of impact it has or can have.

Xplorate have just completed the largest Methane Quantification program globally in Australia for Shell

Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions

According to research, 95% of luminaire's environmental impact comes from use. Efficient lighting and smart controls contributes to sustainability. Our new STRONGEx LED luminaire, with extraordinary energy efficiency up to 165lm/W, helps reduce energy consumption in oil & gas facilities with superior lighting quality. It can incorporate wireless control for improved facility management, to further contribute to save energy.

How does your decarbonisation-related product, process or solution benefit the industry or users?

LED is the most sustainable lighting technology on the market. It can reach remarkable levels of efficiency and performs three times better than traditional technologies, to achieve 50% energy savings. Combined with smart technologies and daylight and presence sensors, it can nett 80% operational cost savings compared with traditional lighting. This reduces wasted electricity and means lighting is provided as required and only switched on when needed. By incorporating the lighting system into a network, site managers understand lighting behaviour to enable greater efficiency. LED technology offers 10 times longer useful life, significantly reducing maintenance.

Please provide any examples of how your decarbonisation-related product, process or solution has been used in the field and what sort of impact it has or can have.

We have participated in HABSHAN III flare gas recovery plant in the UAE, where STRONGEx offers high performance up to 55°C and 100,000 hours lifetime.

How will you be promoting your decarbonisation efforts at ADIPEC 2023?

The new STRONGEx offers exceptional resistance to harsh environmental conditions in Ex Zone 1 and 2. It is an ideal solution for applications across oil & gas, petrochemical, or energy sectors. Its design promotes sustainability with low energy consumption, extended lifecycle, low maintenance, and a recyclable PMMA profile. It can be opened, enabling easy maintenance.

Describe your technology, product, process, or solution that advances decarbonisation by reducing carbon emissions

YOKOGAWA Sustainability Service Environmental, social and governance (ESG) is a key factor for business strategy. Compliance with ESG related regulations, such as renewed EU emission trading system (ETS), Carbon border adjustment mechanism (CBAM) and more, will be inevitable. These regulations require digitalizing the greenhouse gas (GHG) measurement, especially product carbon footprint (PCF). PCF calculation is being executed on a manual basis so far. Furthermore, planning the carbon neutral roadmap and carrying out the emission reduction are challenging.

How does your decarbonisation-related product, process or solution benefit the industry or users?

To solve these problems YOKOGAWA Sustainability service provides following features. - To improve GHG related staff productivity, our service calculates accurate PCF based on Operational technology (OT) system data. Based on Yokogawa's monitoring and control system experience, we can generate plant/factory digital twins for each production line and gathering data through DCS, SCADA and sensors. We use Asset Administration Shell (AAS) digital twin standard and OPC UA information model. - Global regulation compliance reporting: (e.g., CBAM, EU-ETS) Our sustainability service fully integrates with major GHG reporting tools (e.g., SAP Sustainability Footprint Manager, Persefoni and more) - Carbon emission reduction consulting service and proceeding reduction together with customer: YOKOGAWA has global experience of green energy system, battery system, hydrogen system and resource sharing system design and implementation. Based on this, we plan carbon neutral roadmap with customers and proceed for GHG emission reduction together.

Please provide any examples of how your decarbonisation-related product, process or solution has been used in the field and what sort of impact it has or can have.

By utilizing these features, customer can proceed GHG reduction cycle. (We exhibit Sustainability service and demonstrate PCF management based on plant/factory data at our booth.)

How will you be promoting your decarbonisation efforts at ADIPEC 2023?

In Yokogawa booth at ADIPEC 2023, we are exhibiting multiple solutions related to decarbonization including this sustainability service.

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Host



Save the date!

11-14 November 2024

For exhibition enquiries

✉ sales@adipec.com

For sponsorship enquiries

✉ sponsorship@adipec.com

For conference enquiries

✉ delegate@adipec.com