OCTOBER 2024

OGN

OIL, GAS, PETROCHEMICALS & RENEWABLES

# SABIC

## Growing strong globally

**SPECIAL FEATURES:** Industrial Fluids & Lubricants ■ Global Perspective ■ Africa Focus

OGN
OIL, GAS, PETROCHEMICALS & RENEWABLES



www.ognnews.com A component of www.tradearabia.com TradeArabia BUSINESS NEWS INFORMATION OCTOBER 2024 Vol. 41 No.10 Reg No. 1 OGN 025

**Digital twins in industrial water**
With industrial producers experiencing high-fidelity process models in water, a new world of optimisation opportunities open up – from daily actions through to production planning – Page 12


**Urgent mitigation, climate adaptation**
Science and technology alone are not enough to address global challenges such as climate change, and we must embrace diverse knowledge, experiences – Page 26

**Rising flaring calls for sustainable solutions**
The WB's report on gas flaring serves as a glaring reminder of the work that lies ahead, but also as a call to action to accelerate efforts towards a more sustainable future – Page 28

# JAFURAH: GAME-CHANGER THE WORLD IS WATCHING

By ABDULAZIZ KHATTAK

**MANAMA**: Aramco's ambitious Jafurah shale gas project is positioning itself as a game-changer in the global energy landscape.

As the largest unconventional gas field in the Middle East (17,000 sq km), Jafurah is set to significantly boost Saudi Arabia's gas production and diversify the company's portfolio beyond traditional oil.

Estimated resources include 229 trillion standard cu ft (tscf) of raw gas and 75 billion stock tank barrels of condensate. Proven reserves for Jafurah are 15 tscf of raw gas and 2 billion stock tank barrels of condensate.

With an anticipated production of 2 billion standard cu ft per day (bscfd) by 2030 and a projected $100 billion investment over its lifecycle, the project is expected to yield top-tier returns and has the potential to outclass major US shale plays, long considered the benchmark in the industry.

According to a recent Bank of America (BofA) analysis, Jafurah's development is on track with Phase One set to begin production in Q3 2025.

The second phase, which includes major infrastructure expansions like gas compression and pipeline installations, is slated for completion in 2027. In June, Aramco signed contracts worth more than $25 billion for Phase 2.

By the project's final phase in 2030, Aramco expects the field to reach full production, supplying not only natural gas but also high-value liquid products such as condensates, natural gas liquids (NGLs), and ethane.

A key point of interest is the anticipated production of over 420 million standard cu ft per day (mmscfd) of ethane and 630,000 barrels per day (bpd) of NGLs and condensates by 2030. These volumes will supply feedstock to Saudi Arabia's burgeoning petrochemical industry, while also giving the company the flexibility to export surplus products to Asia.

Jafurah has an estimated 229 trillion standard cu ft of raw gas

BofA's deep dive into the project highlighted an estimated net present value (NPV) of $94.3 billion for Jafurah, with an impressive internal rate of return (IRR) of 28.5 per cent. These figures underscore the field's profitability, driven largely by its rich condensate yields.

Condensates are expected to be the primary value driver for the project, with Jafurah boasting a condensate-to-gas ratio (CGR) of approximately 327 barrels per million standard cu ft (bbls/mmscf). This is well above the CGR of US shale plays, which range from 71 to 167 bbls/mmscf.

The long lifecycle of Jafurah's gas and condensate reserves 202 and 326 years, respectively also sets it apart from US shale fields, which typically have reserve lifespans of 15 to 20 years. This resource longevity provides Aramco with a stable, long-term production profile that will continue to generate strong returns for decades.

Aramco's strategic focus on the Jafurah project aligns with Saudi Arabia's broader goals of increasing gas production and reducing reliance on oil. By 2030, the company aims to increase its total gas production by more than 60 per cent, a target that will be supported by Jafurah's substantial output.

In addition to supplying gas for domestic power generation and water desalination, Jafurah's liquids and NGLs are expected to play a crucial role in the kingdom's industrial growth, particularly in the petrochemical sector. This diversification is particularly timely as global oil prices remain volatile.

To unlock the vast resources of Jafurah, Aramco is utilising cutting-edge extraction techniques such as horizontal drilling and hydraulic fracturing. These methods, essential for tapping into the tight shale formations of the Tuwaiq mountain, have proven successful in enhancing gas flow and commercial viability.

## Iraq facing opportunity cost as key pipeline keeps shut

THE restart of a key Iraqi oil pipeline that's been shut for over a year is being held up by disagreements over costs, the nation's prime minister said, a setback that's inadvertently helping the country get closer to its Opec production limit.

Baghdad hasn't been able to agree how much to pay international oil companies operating in the country's north for their production. The federal administration's budget allows it to pay $8 for every barrel of oil produced, while contracts with the Kurdistan Regional Government give the firms $26, Mohammed Shia Al-Sudani, Iraq's Prime Minister, said in an interview with *Bloomberg TV*.

The impasse has hit output from the region and delayed the pipeline's resumption.

The closure of the pipeline that can transport almost half a million barrels a day of oil from Kurdistan to the Turkish coast is resulting in billions of dollars of lost revenue. Yet restarting it would pose a dilemma for Iraq, which has failed to adhere to its Opec+ output limit amid pressing financial needs, but has repeatedly said it will compensate for overproducing.

"We are committed to abide by the Opec decisions and to preserve the price of oil in order to balance the interest of the users and the producers," Al-Sudani said.

Turkey halted the pipeline in March last year after an arbitration court ordered it to pay Iraq $1.5 billion in compensation for transporting oil through the link without Baghdad's approval.

Ankara, which claimed the pipe was shut because it needed repairs after two massive earthquakes in February, said in October that it was ready for operations and it was up to Iraq to resume flows.

But financial and legal issues emerged, such as remunerating companies for costs. International firms have said they also want their past dues — including $1 billion for oil produced between September 2022 and March 2023 — cleared.

With exports shut, the companies have been producing some crude and selling it locally. Iraqi officials have previously said this output caused problems for complying with quotas set by Opec. Iraq has a production limit of 4 million barrels per day (bpd), but produced 4.32 million bpd in August. The country, along with some others in Opec+, will gradually raise these limits starting in December.

Al-Sudani is keen to increase production in the long-term after years of war and internal strife hit Iraq's industry and oil output.

BP in August signed an initial agreement to help boost output from the Kirkuk region. Iraq has also been rehabilitating and upgrading damaged refineries to help cut fuel imports.

## Masdar grows globally with $1.4bn acquisition

**ABU DHABI:** The Abu Dhabi Future Energy Company (Masdar) is set to acquire Saeta Yield, a leading independent developer, owner and operator of renewable power assets, from Brookfield Renewable.

The acquisition, together with its institutional partners, is valued at $1.4 billion, and is expected to be closed by 2024-end.

The transaction consists of a portfolio of 745 megawatts (MW) of predominantly wind assets – 538 MW of wind assets in Spain, 144 MW of wind assets in Portugal and 63 MW solar PV assets in Spain - and includes a 1.6-gigawatt (GW) development pipeline.

Dr Al Jaber (right) and Mark Carney, Chair and Head of Transition Investing at Brookfield

Brookfield will, however, retain and operate 350 MW of concentrated solar power assets.

The deal further cements Masdar's position in the country, in one of Europe's largest renewable markets.

The deal advances its growth plans in the region as the company targets global capacity of 100 GW by 2030.

Recently, Masdar also announced an agreement with Endesa to become a partner for 2.5 GW of renewable energy assets in Spain, subject to regulatory approvals and other conditions.

Dr Sultan Al Jaber, UAE Minister of Industry and Advanced Technology, Chairman of Masdar and COP28 President, said: "Masdar is committed to accelerating the delivery of clean energy capacity across the Iberian Peninsula and Europe. Representing one of Spain's largest renewable energy transactions, this landmark deal with Brookfield Renewable builds on Masdar's strong growth story, demonstrating our commitment to the EU's wider net-zero by 2050 target and unlocking new capacity."

# THROUGH RESILIENCE SABIC OVERCOMES CHALLENGES

The chemicals major's commitment to sustainability and innovation drives its resilience, enabling the company to navigate market challenges effectively while achieving significant milestones in safety and operational efficiency in 2024

## Inside

### Sabic Review



For more news and features, visit
**www.ognnews.com**

SABIC's Home of Innovation Center in Riyadh

**By ABDULAZIZ KHATTAK**

IN early August, SABIC, a leading global chemicals manufacturer, announced a significant rebound in its financial performance for Q2 2024, reporting a net profit of SR2.18 billion ($580 million).

This figure marks an 85 per cent increase from the SR250 million ($70 million) recorded in Q1 of the year, underscoring the company's resilience in a challenging market environment.

Abdulrahman Al-Fageeh, the CEO, attributed this impressive growth to improved product margins, increased sales volumes, and effective management of supply chain disruptions that have affected many sectors globally.

"Our results reflect our resilience, innovation, and ability to adapt to challenging circumstances," he stated. "We are committed to meeting the demands of our customers worldwide."

In line with its solid performance, SABIC declared a cash dividend of $1.36 billion for H1 2024, signalling its robust financial health and dedication to returning value to shareholders.

Notably, SABIC has realised cumulative benefits exceeding $2 billion through synergies with Saudi Aramco, highlighting the strength of this strategic partnership. These synergies have been instrumental in streamlining operations and enhancing overall competitiveness.

In addition to its financial achievements, SABIC has made significant strides in its environmental, health, safety, and security (EHSS) initiatives.

Al-Fageeh reported a substantial improvement in safety performance, with a Safety and Health Event Rate (SHER) of 0.18 for Q2 2024, a remarkable 62 per cent decrease from 0.47 in the same quarter of the previous year.

This commitment to safety is vital for SABIC, especially as it expands its operations globally.

In May 2024, SABIC successfully completed the divestment of its stake in the Saudi Iron and Steel Company (Hadeed) to the Public Investment Fund (PIF).

This strategic move allows SABIC to concentrate on its core portfolio of chemicals and polymers, aligning with Saudi Arabia's Vision 2030 goals aimed at economic diversification and industrial development.

Al-Fageeh emphasised that this decision not only streamlines operations but also positions both SABIC and Hadeed for new growth phases.

### BRAND VALUE & INNOVATION LEADERSHIP

SABIC's brand value has also seen a commendable increase, rising to $4.89 billion in 2024, marking a 3.7 per cent growth.

This achievement underscores the company's increasingly favourable perception among its target audiences and its status as the second most valuable brand in the global chemicals sector for the second consecutive year.

Al-Fageeh comments: "The strength of our global brand is a clear reflection of our collaborative business approach and dedication to nurturing enduring relationships with our customers. We remain steadfast in providing market-leading solutions while ensuring that sustainability remains integral to our economic value creation and growth strategy."

The recognition received by SABIC for its innovative solutions winning multiple Edison Awards reinforces its commitment to excellence in research and development.

These accolades demonstrate the company's leadership in providing solutions that not only meet but exceed customer expectations.

### SUSTAINABILITY COMMITMENT

Throughout the first half of 2024, SABIC made significant strides in its sustainability initiatives.

The company inaugurated the world's first large-scale electrically heated steam olefin cracking furnace in the Netherlands, which is expected to reduce carbon emissions substantially compared to traditional methods.

This project aligns with SABIC's commitment to achieving carbon neutrality by 2050 and illustrates the firm's proactive stance on addressing climate change challenges.

Moreover, SABIC has begun construction on its Fujian Petrochemical Complex in China, a $6.4-billion joint venture that promises to enhance the company's product offerings and production capabilities significantly.

The complex is poised to leverage leading technologies and is expected to commence operations in 2026, further solidifying SABIC's presence in the crucial Asian market.

In addition to its international projects, SABIC is also prioritising localised manufacturing to bolster its competitive edge.

The company is undertaking a strategic project to manufacture catalysts in Saudi Arabia, which aims to transform the country into a manufacturing hub for specialized materials.

This initiative aligns with the Shareek programme, which seeks to enhance the competitiveness of the energy sector and increase local content in industrial production.

### FUTURE OUTLOOK

Looking ahead, SABIC remains focused on leveraging its strengths to navigate ongoing market challenges while continuing to deliver value to stakeholders.

With a robust balance sheet and a commitment to innovative solutions, the company is well-positioned for sustainable growth in the evolving chemical landscape.

As SABIC continues to align with Vision 2030, its efforts to enhance operational efficiency, invest in cutting-edge technologies, and expand its global footprint will be critical to maintaining its leadership in the chemical industry.

The company's unwavering commitment to sustainability, safety, and innovation will undoubtedly play a pivotal role in shaping the future of the global chemicals sector.

With its strategic initiatives and a clear focus on growth, SABIC is poised to not only weather economic fluctuations but also emerge stronger in the years to come.

# New Jubail HQ is a testament to innovation & sustainability

By ABDULAZIZ KHATTAK

IN the heart of Jubail, a stunning architectural marvel stands as a symbol of SABIC's 47-year legacy of innovation and commitment to sustainability.

Inaugurated on November 23, 2022, the new headquarters was conceived with a singular vision: to create an environment that not only meets the needs of today's workforce but anticipates the demands of the future.

The building, which houses around 3,500 employees, embodies a human-centric philosophy.

Facilities managers aimed to foster collaboration and connectivity, resulting in an open-space floor plan that blurs the lines between staff and management.

This design choice reflects SABIC's core values of inspiration and engagement, encouraging a vibrant workplace culture.

The space is thoughtfully equipped with flexible furniture and communal areas, including large dining facilities and modern collaboration hubs capable of accommodating over 1,500 people.

Safety was paramount in the building's construction, especially given its coastal location.

Employing advanced stilt structure technology sourced from Europe and the US, along with SABIC-produced steel (Hadeed), the building is designed to withstand the elements.

An impressive array of over 1,500 solar panels, complemented by cutting-edge wind energy systems, provides the energy necessary to power the recreation center and parts of the parking area, leading to significant reductions in CO2 emissions.

SABIC's Jubail headquarters is not just aesthetically pleasing; it also ranks among the most energy-efficient buildings of its kind in Saudi Arabia.

Thanks to a host of energy-saving measures such as natural sunlight utilisation for interior lighting, a sophisticated chilled water system for HVAC needs, and a waste-minimising catering service the building was awarded the prestigious Leadership in Energy and Environmental Design (LEED) Gold certification shortly after its inauguration.

Digital integration is another cornerstone of this innovative space. Equipped with smart meeting rooms and a mobile app reservation system, the building facilitates a dynamic and adaptable work environment.

SABIC's Jubail headquarters ranks among the most energy-efficient buildings in Saudi Arabia

It is also set to become SABIC's primary data hub, connecting global sites with advanced data systems that enhance operational efficiency.

Moreover, the construction of this impressive facility reflects SABIC's dedication to bolstering the local economy.

Over 77 per cent of the materials and services used in the building's mechanical, electrical, and finishing works were sourced locally, aligning with Saudi Vision 2030 and contributing to regional growth.

Since its opening, the Jubail headquarters has already become a vibrant center for employee engagement, hosting numerous events, from training sessions to roadshows.

In every detail, from its innovative design to its sustainability features, SABIC's Jubail headquarters stands as a testament to the company's vision for the future a future that embraces both people and the planet.

# Taking bold steps in the fight against climate change

By ABDULAZIZ KHATTAK

SABIC is steadfast in its commitment to combat climate change, engaging in innovative partnerships and initiatives that drive sustainability across the globe.

With a focus on creating a circular economy for plastics, the company is actively involved in several key collaborations aimed at reducing environmental impact and fostering responsible resource management.

One significant initiative is the Alliance to End Plastic Waste (AEPW), launched in early 2019 with the support of 20 founding members, including SABIC.

This alliance seeks to harness innovation and scale up solutions that promote sustainable practices in the plastic industry.

It brings together some of the world's foremost companies from the chemical, plastic, consumer goods, and waste management sectors, all united in their commitment to advancing AEPW's mission.

SABIC's engagement within the alliance is robust, with representation on the board and participation in regional strategic and implementation task forces.

In 2023, AEPW further expanded its impact by partnering with Lombard Odier Investment Managers (LOIM) to establish the Circular Plastics Fund.

This initiative aims to generate positive environmental, social, and economic outcomes while providing attractive financial returns.

SABIC is a founding member of AEPW to end plastic waste

By fostering investment in innovative recycling technologies and circular business models, SABIC and its partners are positioning themselves at the forefront of the global shift towards sustainability.

Building on its commitment to carbon neutrality, SABIC is also a co-chair of the recently relaunched Global Impact Coalition (GIC).

This CEO-led initiative, which includes nine major industry players such as BASF, Covestro, and Siemens Energy, is dedicated to helping the chemical sector achieve carbon neutrality by 2050.

SABIC is leading efforts to cultivate partnerships that address the industry's challenges and drive collaborative research and development projects.

One of the first initiatives under GIC focuses on advancing both chemical and mechanical recycling of plastics.

This project aims not only to enhance recycling processes but also to significantly reduce the CO2 footprint associated with plastic production and waste.

The coalition's efforts have the potential to yield substantial results in the transition to a carbon-neutral future, setting a precedent for large-scale environmental change.

SABIC's climate advocacy extends beyond industry collaborations. In 2023, the company participated in major global forums, including the UN MENA Climate Week and COP 28, as well as the Saudi Green Initiative Forum in Dubai.

These engagements reaffirm SABIC's dedication to supporting both national and international climate action efforts, while also showcasing its initiatives aimed at accelerating progress toward carbon neutrality.

Additionally, in a bid to nurture the next generation of innovators, SABIC has teamed up with PepsiCo, AstroLabs, and other strategic partners to launch the Mega Green Accelerator.

This initiative is designed to empower young innovators to develop solutions that address regional and global sustainability challenges, such as circularity and energy transition.

Through these concerted efforts, SABIC is not only contributing to the global fight against climate change but also leading by example in the chemical industry, demonstrating that sustainable practices and economic growth can go hand in hand.

As the world grapples with the impacts of climate change, SABIC's initiatives provide a hopeful pathway toward a more sustainable future.

# SABIC is pioneering solutions with global investments

## The company's strategy focuses on integrating local partnerships and leveraging advanced technologies to meet the growing demands of various sectors, including energy, petrochemicals, automotive, construction, and healthcare

By ABDULAZIZ KHATTAK

IN the ever-evolving landscape of the global petrochemical industry, Saudi Basic Industries Corporation (SABIC) has established itself as a formidable player, strategically investing across diverse regions.

With a commitment to innovation and sustainability, SABIC's extensive investments not only enhance its operational capabilities worldwide but also bolster its position in the Kingdom of Saudi Arabia, driving economic growth and fostering international partnerships.

Since its inception, SABIC has made substantial investments that span continents, from North America and Europe to Asia and the Middle East.

The company's strategy focuses on integrating local partnerships and leveraging advanced technologies to meet the growing demands of various sectors, including energy, petrochemicals, automotive, construction, and healthcare.

In recent years, SABIC's commitment to sustainability has intensified, aligning with global trends towards greener practices.

This focus is evident in its investments aimed at producing low-carbon and renewable products, responding to a rising consumer demand for sustainable solutions.

### INVESTMENTS IN ASIA: A KEY FOCUS

Asia has emerged as a pivotal region for SABIC, with significant investments aimed at harnessing local growth opportunities.

The company's partnerships in China, including joint ventures with SINOPEC and Fujian Energy Petrochemical, exemplify its strategic approach.

The SINOPEC SABIC Tianjin Petrochemical (SSTPC) has become a world-scale mega complex, recently enhanced by a new polycarbonate (PC) plant that commenced operations in early 2023.

This facility significantly increases SABIC's capacity to serve the burgeoning demand in the Asia-Pacific market.

Furthermore, the SABIC Fujian Petrochemical Complex, a landmark investment with a projected capacity of 1.8 million tonnes of ethylene per year, underscores the company's ambition in China.

Set to commence construction in 2024, this facility not only reinforces SABIC's presence in the region but also acts as a linchpin for further collaborations in line with Saudi Vision 2030 and China's Belt and Road Initiative.

### STRENGTHENING OPERATIONS IN EUROPE

In Europe, SABIC is undergoing a transition to better align its operations with market demands and sustainability goals.

The region, which is crucial for SABIC's global strategy, has seen the company suspend less efficient plants while investing in innovative projects.

SABIC and Fujian government sign potential investment agreement to build engineering thermoplastics compounding plant

This restructuring aims to enhance competitiveness, particularly in light of increasing environmental regulations and a shift towards a circular economy.

One noteworthy initiative includes investments in advanced recycling technologies and bioplastics.

SABIC is committed to developing sustainable materials that meet the stringent regulations of the European market, ensuring its products remain relevant and competitive.

### EXPANDING IN NORTH AMERICA

SABIC's presence in North America has also been strengthened through strategic investments. The company has focused on expanding its manufacturing capabilities, particularly in the US. With a keen eye on the automotive and consumer goods sectors, SABIC is leveraging local resources to enhance its product offerings.

Recent collaborations with leading companies in North America have enabled SABIC to drive innovation in materials science, particularly in developing lightweight and durable plastics that contribute to fuel efficiency in automotive applications.

These initiatives not only support SABIC's growth in North America but also create synergies that benefit its operations back in Saudi Arabia.

### THE MIDDLE EAST AND BEYOND

Within the Middle East, SABIC's investments are pivotal for regional development. A notable collaboration includes a project with OQ and Kuwait Petroleum International to establish a petrochemical complex in Oman.

This joint venture aims to incorporate cutting-edge technology with a focus on sustainability, reflecting SABIC's commitment to fostering economic development within the region.

Additionally, SABIC has made strides in diversifying its product portfolio by investing in the production of specialty chemicals and advanced materials, which are increasingly sought after in various sectors, including construction and electronics.

### THE PATH FORWARD

As SABIC moves forward, its investments will increasingly reflect a commitment to sustainability.

The company is at the forefront of adopting circular economy principles, which emphasise the importance of recycling and reusing materials to minimise waste.

This strategic pivot not only meets the expectations of environmentally conscious consumers but also aligns with global initiatives aimed at reducing carbon footprints.

SABIC's investment in research and development is critical for this transition. By collaborating with academic institutions and industry leaders, SABIC is pioneering new technologies that will redefine the future of materials and chemical production.

### CONCLUSION

SABIC's global investment strategy is a testament to its vision of being a leading global chemical company while fostering local economic development.

Through strategic partnerships and innovative projects, SABIC is not only enhancing its operational footprint abroad but is also contributing significantly to Saudi Arabia's economic diversification efforts.

As the company continues to adapt to market demands and embrace sustainability, it remains poised for growth, both at home and in the international arena.

SABIC's journey reflects a broader narrative of resilience and innovation, crucial for navigating the complexities of the global petrochemical landscape.


The groundbreaking ceremony marking the start of full execution and construction phase of SABIC Fujian Petrochemical Complex

# SABIC drives sustainability with bold initiatives

As it continues to push the boundaries of science and technology, SABIC is demonstrating that sustainable business practices are not only viable but essential for long-term success

By ABDULAZIZ KHATTAK

IN a world increasingly focused on sustainability, SABIC, a global leader in diversified chemicals, is setting a high standard for corporate responsibility.

With a commitment to pioneering eco-friendly solutions, the company has implemented a wide array of initiatives aimed at enhancing its sustainability performance.

From advanced recycling technologies to low-carbon ammonia production, SABIC is determined to lead the charge towards a greener future.

The company not only aims to reduce its environmental footprint but also seeks to empower its customers and communities by providing sustainable alternatives across a variety of sectors.

Since 2020, SABIC has embraced a comprehensive methodology developed by the World Business Council for Sustainable Development (WBCSD) to conduct sustainability assessments across its product portfolio.

This approach reflects a deep understanding that sustainability is not merely an add-on to business practices but rather an essential component of the company's overall strategy.

In 2023, this effort expanded significantly, with 63 per cent of the company's total revenue now assessed up from 48 per cent in 2022.

This rigorous evaluation process not only drives internal improvements but also ensures that customers receive sustainably sourced products that meet the growing demand for environmental responsibility.

The company's commitment to innovation is further illustrated by its impressive output of patent applications.

In 2023 alone, SABIC filed 224 patent applications, 40 per cent of which focused on enhancing environmental attributes.

This commitment to research and development serves as a testament to SABIC's strategy of integrating sustainability into its core business practices.

By actively pursuing innovative solutions, SABIC is not only addressing current environmental challenges but is also preparing to meet the future needs of its customers and stakeholders.

## RECOGNITION AND AWARDS

SABIC's efforts in sustainability have garnered significant recognition within the industry. In 2023, the company received five Edison Awards for product innovation, reflecting its commitment to excellence and creativity in developing sustainable solutions.

Among these accolades, the R&D 100 Award for its LNP™ ELCRES™ CRX copolymer resin highlights the company's dedication to creating high-performance materials with a reduced environmental impact.

Furthermore, Bob Maughon, SABIC's Executive Vice President of Technology and Innovation, was honoured as 'R&D Sustainability Innovator of the Year'.

This recognition not only underscores Maughon's leadership in driving sustainability initiatives but also reflects SABIC's culture of innovation and excellence.


BASF, SABIC, and Linde celebrate the start-up of the world's first large-scale electrically heated steam cracking furnace

**Ambitious Sustainability Goals**

Among the highlights of SABIC's sustainability agenda are its ambitious targets for carbon neutrality and circularity.

In early 2023, SABIC set a goal to process at least 1 million metric tonnes of TRUCIRCLE™ products annually by 2030, sourced from bio-based or recycled feedstock.

This ambitious goal aligns with the company's vision of fostering a circular economy where materials are reused and recycled, thus minimising waste.

The launch of the Circular Technology Road Map in October 2023 lays out a strategic framework to achieve this target, commencing with a significant processing of 18,000 metric tonnes this year.

This initial step demonstrates SABIC's commitment to building a strong foundation for future partnerships and collaborations that will enhance its capacity in sustainable materials.

SABIC's investment in advanced recycling technologies further exemplifies its commitment to a circular economy.

The company is on track to open a commercial plant for advanced recycling in Geleen, The Netherlands, in 2024.

This facility will significantly boost SABIC's ability to process and recycle plastics, transforming waste into valuable resources that can be reintroduced into the production cycle.

By facilitating the recycling of plastic waste, SABIC not only contributes to reducing landfill waste but also supports the development of sustainable materials that meet customer demands.

## DRIVING INNOVATION THROUGH COLLABORATION

Collaboration is key to SABIC's sustainability strategy. The company has partnered with industry leaders BASF and Linde to develop the world's first large-scale electrically heated steam-cracker furnace, which aims to reduce CO2 emissions by, at least, 90 per cent compared to conventional technologies.

The last transformer for this groundbreaking facility was installed in September 2023, with commissioning set to begin in early 2024. This partnership exemplifies the potential of collaborative efforts in driving innovation and achieving significant environmental benefits.

SABIC has also made strides in the bioeconomy with the introduction of bio-based NORYL™ resin grades, certified under the ISCC PLUS scheme.

This initiative showcases SABIC's dedication to renewable plastic solutions that can be applied across various industries, from automotive to construction.

By offering bio-based alternatives, SABIC is not only enhancing its product portfolio but also helping its customers transition towards more sustainable practices.

In the agricultural sector, SABIC Agri-Nutrients has emerged as a pioneer by introducing certified low-carbon ammonia to the Indian fertilizer market.

This significant milestone marks a crucial step in decarbonising agricultural practices and reflects SABIC's commitment to providing low-carbon solutions that contribute to a more sustainable food supply chain.

The shipments of low-carbon ammonia and urea to various international markets, including Japan and New Zealand, underscore SABIC's ambition to be a leading player in the low-carbon ammonia market, further promoting sustainable agricultural practices.

## TACKLING PLASTIC WASTE

The chemical recycling of plastic waste is another cornerstone of SABIC's sustainability initiatives.

*Continued on page 10*


SABIC's advanced recycling unit in Geleen, The Netherlands

As the company continues to invest in transformative technologies and collaborative partnerships, it is poised to play a leading role in shaping the future of the petrochemical industry

# Petchem giant leads with groundbreaking innovation

By ABDULAZIZ KHATTAK

IN a world increasingly focused on sustainability and technological advancement, SABIC is positioning itself as a leader in the petrochemical industry through groundbreaking innovations and strategic investments.

With a robust commitment to both segment-driven and process innovation, SABIC is not only enhancing its operational efficiency but also paving the way for a greener future, meeting the challenges posed by plastic waste and carbon neutrality head-on.

SABIC's Technology & Innovation (T&I) division is pivotal to the company's growth strategy, aiming to deliver low-carbon and circular solutions that cater to evolving market demands.

The company has set ambitious goals, pledging to sell 1 million tonnes of bio-based and circular products annually by 2030.

This commitment encompasses a wide range of applications, from automotive and electronics to innovative packaging solutions such as mono material stand-up pouches and HDPE hinge caps.

These initiatives are aligned with SABIC's mission to tackle the pressing end-of-life issues associated with plastics.

Collaboration is a cornerstone of SABIC's T&I strategy, with partnerships spanning the entire value chain, from waste management to brand owners and retailers.

By engaging with prominent organisations such as the Alliance to End Plastic Waste and the World Economic Forum, SABIC is driving collective solutions to industry-wide challenges.

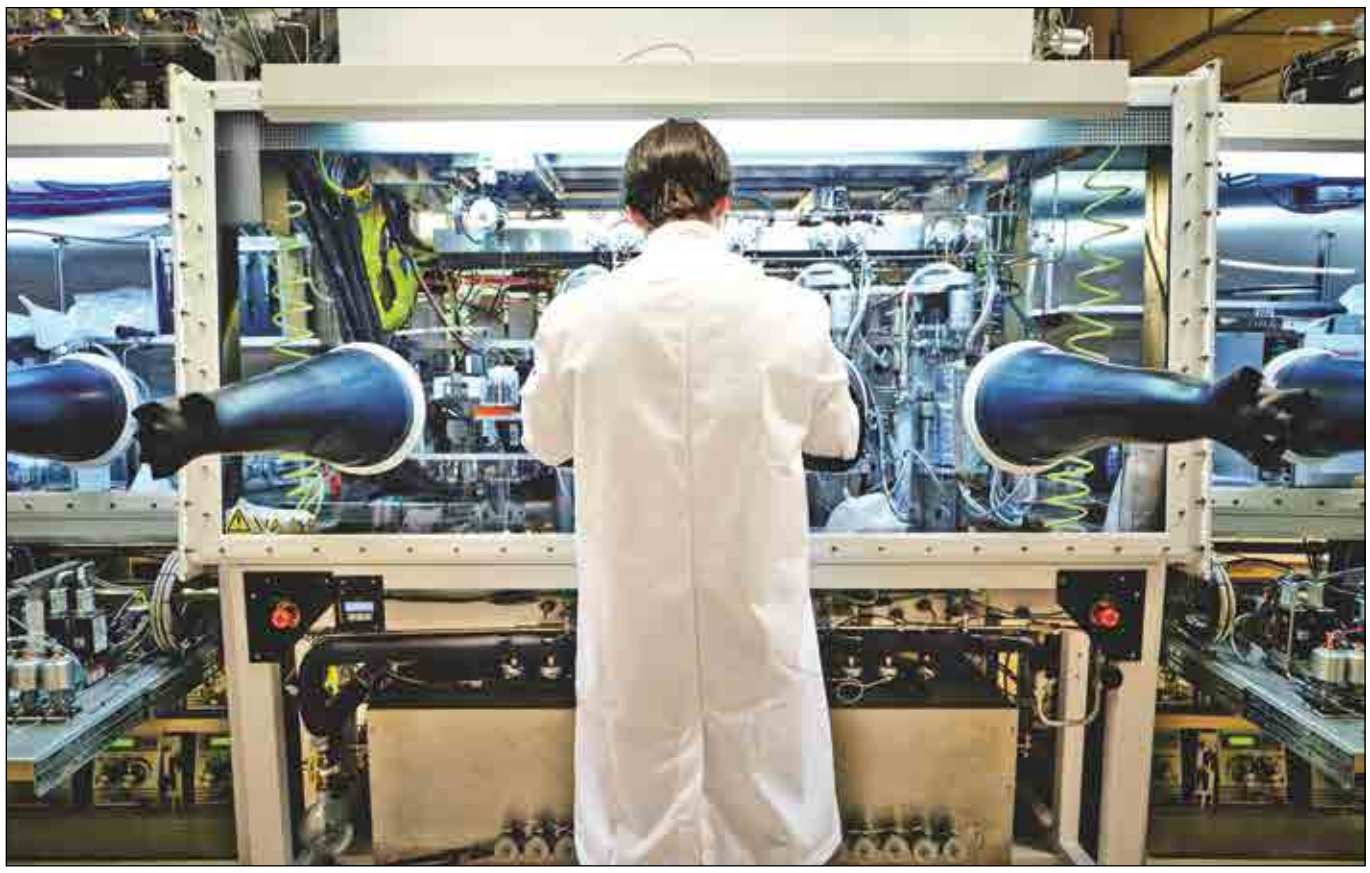
The T&I function emphasises three key pillars: talent development, portfolio enhancement, and performance improvement, ensuring the company remains agile and responsive to market dynamics.

As digital transformation sweeps across industries, SABIC is harnessing emerging technologies to enhance its operational framework.

The launch of its Digital Transformation strategy is set to revolutionise the company's core business processes, utilising big data, machine learning, and artificial intelligence to drive efficiencies and reduce risks.

A key component of this strategy is the development of the STAR platform, a next-generation Enterprise Resource Planning (ERP) system designed to streamline operations and connect stakeholders worldwide, ultimately delivering greater value to customers.

SABIC's commitment to innovation extends beyond traditional petrochemicals, as evidenced by its long-term partnership with Formula E, the world's first electric motorsport championship.



SABIC continues to invest in transformative technologies

This collaboration not only promotes electrification but also positions SABIC at the forefront of automotive innovation.

The recent unveiling of the GENBETA race car, developed in conjunction with Formula E and utilising SABIC's cutting-edge materials, showcases the company's role in advancing electric vehicle technology.

The GENBETA achieved a remarkable speed of 218.71 kmph, setting a new Guinness World Record for Indoor Land Speed, further underscoring SABIC's impact on the racing and automotive sectors.

With the global shift towards electric vehicles gaining momentum, SABIC's Bluehero™ initiative aims to support the automotive industry in its transition to electric power.

By fostering an ecosystem of materials and expertise, SABIC is ensuring that manufacturers can expedite the development of advanced electric vehicle models.

In summary, SABIC's relentless focus on innovation and sustainability not only enhances its competitive advantage but also addresses critical environmental challenges.

As the company continues to invest in transformative technologies and collaborative partnerships, it is poised to play a leading role in shaping the future of the petrochemical industry and beyond.

# Driving sustainability with bold initiatives

*Continued from page 8*

In a groundbreaking project, SABIC collaborated with Saudi Aramco and TotalEnergies to successfully convert oil derived from plastic waste into ISCC PLUS certified circular polymers.

This project addresses the challenge of end-of-life plastics, utilising non-sorted plastics that are often difficult to recycle mechanically.

The ability to convert these materials into valuable feedstock represents a significant advancement in tackling plastic waste, demonstrating SABIC's leadership in the circular economy.

The first milestone of this project was obtaining ISCC PLUS certification, which assures transparency and traceability of the recycled origin of feedstock and products.

This level of certification is crucial in building consumer trust and ensuring that the products meet stringent sustainability standards.

The pyrolysis oil produced from this initiative was processed at the SATORP refinery, a joint venture between Saudi Aramco and TotalEnergies, and subsequently used as feedstock for polymers manufactured by SABIC's affiliate Petrokemya.

## CARBON CAPTURE TECHNOLOGIES

SABIC's proprietary carbon capture technology is another significant aspect of its sustainability agenda.

The carbon capture and utilisation (CCU) plant at the Jubail United Petrochemical Company captures and purifies up to 500,000 metric tons of CO2 annually, repurposing it as valuable feedstock for various applications.

This facility, opened in 2015, remains one of the largest CCU plants globally, highlighting SABIC's commitment to leveraging cutting-edge technology to address climate change.

The high purity of processed CO2 produced at the CCU plant is considered food grade, allowing it to be used in a range of commercial and industrial applications, from fertilisers to medical products.

This integrated approach not only reduces emissions but also creates new market opportunities, reinforcing SABIC's commitment to sustainability as a core principle of its operations.

By effectively capturing and utilising CO2, SABIC demonstrates that environmental responsibility can go hand in hand with business growth.

Moreover, SABIC was established by royal decree to convert waste natural gas into valuable chemicals, aligning with its founding principles of innovation and sustainability.

This long-standing commitment to creating value from waste reflects the company's ongoing dedication to pushing the boundaries of science and technology in pursuit of a more sustainable future.

## LOOKING AHEAD

As the world navigates the transition to a low-carbon economy, SABIC remains steadfast in its mission to innovate and lead in sustainable practices.

The company's approach is guided by its vision of a circular carbon economy, which aims to create a system where all value chains loop back on themselves.

This vision encompasses not only product design and development but also the optimisation of industrial processes, including the capture and utilisation of carbon-containing gases as valuable feedstock.

By focusing on the four pillars of sustainability reduce, reuse, recycle, and remove SABIC is advancing a comprehensive strategy that addresses the multifaceted challenges of climate change and resource scarcity.

The company's commitment to reducing its carbon footprint while providing innovative, sustainable products positions it as a leader in the global transition towards a more sustainable future.

SABIC's leadership in sustainability also extends to engaging with stakeholders, including customers, suppliers, and communities, to drive collective action.

By fostering partnerships and collaborations, SABIC aims to amplify its impact and encourage a broader commitment to sustainability within the industry.

In conclusion, SABIC is not just adapting to the challenges of sustainability; it is actively shaping the future.

Through its ambitious goals, innovative technologies, and collaborative efforts, the company is setting a benchmark for corporate responsibility in the chemical industry.

As it continues to push the boundaries of science and technology, SABIC is demonstrating that sustainable business practices are not only viable but essential for long-term success.

With a clear vision and unwavering commitment, SABIC is poised to lead the way in creating a more sustainable world for generations to come.

As industrial producers experience the use of high-fidelity process models in water, a new world of optimisation opportunities open up – from daily actions through to production planning and even evaluation of capital projects, Neil Davidson from Ecolab tells ***OGN***

# Improving productivity with digital twins in industrial water

NALCO Water, an Ecolab company, has been serving industrial producers for nearly a century. At the heart of that service is deep domain expertise in how water impacts industrial production plant.

"From our beginnings, we have pioneered innovative technologies in water chemistry and automation to help industry achieve greater environmental compliance, reliability, and efficiency," Neil Davidson, Business Development Lead, Climate Intelligence & Partner Solutions, Ecolab, tells ***OGN*** energy magazine.

In the past 30 years Nalco Water has deployed its industry-leading 3DTrasar technology – 40,000 installed water monitoring systems producing 90 billion data points annually.

More recently we have brought digital solutions to industry to quantify individual plant equipment performance that may have previously been overlooked, under-estimated or not fully understood.

With such insights, together with our industrial producer customers we are empowered to take informed, quantified actions to address performance gaps in reliability and efficiency at the individual plant equipment level based on our perspective through water.

However, to take the performance of industrial water to the next level for producers to achieve their ambitious sustainability goals, a novel approach is required.

An approach that takes a holistic view of water and production so that decisions on sustainability outcomes are informed based on production needs. Productivity must improve along with sustainability.

Water's role is complicated and its relationship to production processes is often not understood sufficiently to allow optimisation.

What we have seen repeatedly is that the interrelationship between water and production is invariably multifaceted and very dynamic with numerous variables capable of working in conjunction or opposition with each other.

The net outcome of these usually needs to be understood in the context of highly integrated operations where the risk of overall sub-optimal performance is high, especially as deficiencies in one part of the circuit can significantly impact the operation downstream, often with multiplier effects.

Given this complexity, only a truly holistic view of production can highlight what is dictating economic and environmental performance at any given time.

Neil Davidson

Ultimately, this necessitates having a production-centric view of water and a water-centric view of production.

Once such a framework is in place, the value it can provide to restore or even exceed design/best practice conditions can be remarkable.

This is especially the case if it is targeted at delivering sustainable production with the objective of producing 'more for less' energy/emissions, water, and waste.

Here we need to highlight that industrial operations cannot adequately meet their sustainability goals without understanding the essential role of water, particularly as an energy transfer medium.

In refinery operations for example, 35 per cent to over 70 per cent of the total energy is transferred in this way and yet historically this perspective has not been used to inform holistic and integrated optimisation.

We see this energy nexus repeatedly in heavy industry, and the emerging low-carbon energy technologies are no less water and energy intensive.

As we explored the light industry sectors, what we found was that not only did water continue to serve as the predominant energy carrier, but product quality became of increasing importance to productivity.

This is particularly relevant in those products that contain water by formulation such a beer, but also in industries where cooling duty and quality has a significant impact on productivity – such as in microprocessor chip manufacturing.

We see sustainability goals (Figure 1) applied equally numerous and ambitious across the industrial sector, with water at the heart of many decisions.

Having established the "vital roles of water" across the Industrial sector, we focused on a developing a "universal truth" of the relationship between water and its impact on production to achieve sustainable productivity.

This understanding would lead to the development of high-fidelity process models as it would allow us to apply our domain knowledge to the model concept. The universal truth can be illustrated with the tetrahedron in Figure 2.

These interrelationships apply regardless of the nature of the production – at the same time of conserving water and energy and minimising risks (water related scaling, corrosion, fouling, microbial, deposition, product quality, contamination…), the producer must at all times ensure these resources are optimised for maximum productivity – more for less – and optimised dynamically for the reasons mentioned above.

Industrial producer's profitability is predicated on their productivity, and to remain competitive must be able to produce their products at all levels of demand, in the most optimal, agile, and conservative way.

In many cases, effective use of water is the largest differentiator for competitiveness.

Having established the modelling concepts, we engaged our digital twin partner, Siemens, to build the model, incorporating our domain expertise, and applied this model to already well optimised, world scale refineries and petrochemical plants.

Due to our long history of serving these energy-intensive industries, we were able to secure two pilot sites to achieve proof of concept.

Following the period of building and validating the models in cooling water and steam, the results were surprising – not only could we find opportunities for energy efficiency and reliability improvements through water, but we also found considerable water optimisation savings with commensurately high energy savings.

Most importantly, and critical to producers need of more for less, we found productivity improvements (more product) that could be achieved at no additional energy requirements (that is, reduced energy intensity).

We were also surprised to see how cooling water performance changes over a brief period, for example just a few hours during a morning, and how such changes are productivity impactful.

Our early results confirmed that the vital role of water in energy transfers can be optimised to help industrial producers achieve water and energy savings that will directly impact their sustainability goals, such as 2030 emissions reduction targets.

For a typical world scale refinery or petrochemical plant, setting aside feedstock costs, the total cost of operation is predominantly comprised from people and power.

The energy bill (fuel, electricity) to run a refinery and petrochemical plant can exceed $100 million annually. Of this, 35-75 per cent of this energy cost passes through water at some point.

Small inefficiencies can create multimillion dollar consequences.

During the development of our digital twin, we have found energy savings of over $5 million annually, water savings of over 1million tonnes per year, carbon intensity improvements of over 5 per cent and productivity improvements from $5-10 million annually.

As our industrial producers experience the use of high-fidelity process models in water, a new world of optimisation opportunities open up – from daily actions through to production planning and even evaluation of capital projects.

There is excitement building about the savings that are achievable now, require little or no capex, and can help industrial producers on their journey to greater productivity at a time when they need it most.

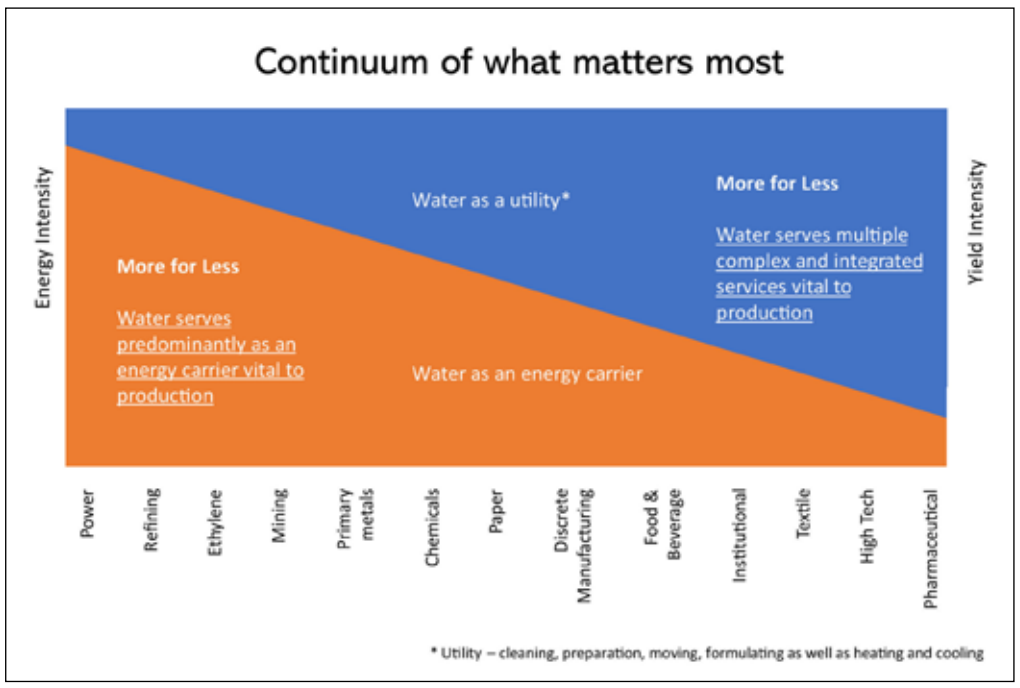



Figure 1

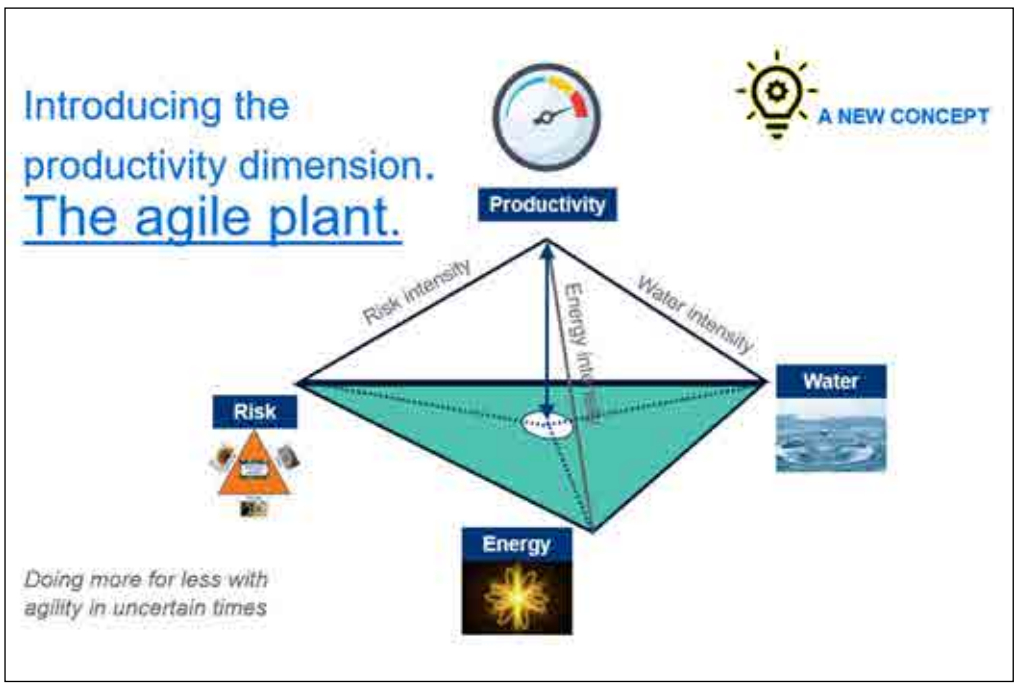



Figure 2

# SABIC-SENDAN: Strategic partners in localisation

**By ensuring that industrial development benefits local enterprises, SENDAN contributes to a more self-sufficient and resilient economy, advancing Saudi Arabia's Vision 2030 for economic diversification and sustainable growth, Heon Jae Yim tells *OGN***

SENDAN International and Saudi Basic Industries Corporation (SABIC) have forged a strategic partnership that significantly contributes to the Kingdom's Vision 2030.

This collaboration focuses on key areas such as localisation, workforce development, technological innovation, and sustainability.

"Together, they drive industrial growth and enhance competitiveness," Heon Jae Yim, CEO, tells *OGN* energy magazine in an interview.

One of the latest initiatives, a state-of-the-art modular construction and fabrication facility in Jubail, highlights SENDAN's commitment to localisation and diversification.

This expansion strengthens SENDAN's position as a leading player in the Kingdom's industrial construction sector.

"By expanding its service portfolio to include specialised offerings such as hydro jetting, chemical cleaning, vacuuming, valve testing and maintenance, and rotating equipment overhauling, SENDAN improves efficiency, shortens project timelines, and meets the increasing demands of large-scale industrial brownfield and retrofit maintenance projects. These improvements ensure SENDAN remains a reliable partner and strengthen its position as a comprehensive one-stop industrial solutions provider," says Yim.

Below are excerpts from the interview:

**• How does SENDAN's partnership with SABIC and other operating companies support Saudi Arabia's Vision 2030?**

SENDAN enjoys a strong reputation with major petrochemical companies like SABIC and Aramco JVs. Our collaboration focuses on economic diversification and reducing dependency on foreign resources. SENDAN plays a pivotal role in creating local job opportunities, transferring global expertise to the local workforce, and establishing a self-sustaining industrial construction base. This partnership empowers Saudi nationals to shape the Kingdom's future economy.

By fostering a robust industrial construction sector, SENDAN and its partners are contributing not only to economic growth but also to ensuring that the benefits are widely distributed among Saudi citizens.

**• What roles does SENDAN play in critical projects?**

SENDAN is a key player in large-scale and critically important projects in the industrial sector, offering expertise in general construction (CMEI), pre-commissioning, commissioning, maintenance, retrofit, and upgrade projects as a one-stop solution provider.

The company leads modular fabrication ventures requiring high precision and operational efficiency.

SENDAN's facilities in Dammam, Rabigh, and Jubail enhance its ability to support projects, ensuring faster and smoother execution. These facilities are staffed by highly skilled professionals and equipped with cutting-edge technology, differentiating SENDAN to meet the stringent quality and safety standards set by operating companies in the petrochemical, oil and gas, and power sectors.

Heon Jae Yim

*By expanding its service portfolio to include specialised offerings such as hydro jetting, chemical cleaning, vacuuming, valve testing and maintenance, and rotating equipment overhauling, SENDAN improves efficiency, shortens project timelines, and meets the increasing demands of large-scale industrial brownfield and retrofit maintenance projects. These improvements ensure SENDAN remains a reliable partner and strengthen its position as a comprehensive one-stop industrial solutions provider*

**• How does the expansion of services enhance project execution?**

SENDAN has broadened its service portfolio to ensure efficient and timely project execution by introducing specialised services such as high-pressure hydro jetting, vacuuming, bundle pulling, re-tubing of heat exchangers, valve testing and overhauling, and rotating equipment testing and overhauling.

These services, provided under one roof, are crucial during both planned and unplanned shutdowns of various plants and affiliates, streamlining maintenance processes and minimising downtime.

Additionally, the introduction of advanced technologies, such as automated welding processes, has significantly improved efficiency in our workshops. These enhancements enable SENDAN to deliver higher-quality services, reduce project timelines, and meet the growing demands of large-scale industrial projects.

SENDAN's focus on continuous improvement ensures that the company remains a trusted partner, delivering projects on time and within budget.

**• How does the renewal of the construction alliance agreement with SABIC enhance SENDAN's capabilities?**

The renewal of the construction alliance agreement with SABIC strengthens SENDAN's ability to take on larger, more complex projects, reinforcing the long-standing partnership.

This agreement enhances our capabilities by providing access to strategic opportunities, allowing the company to apply its expertise in pre-shutdown activities like fabrication, project management, and advanced construction techniques, meeting SABIC's high standards.

Additionally, this collaboration supports us in localisation efforts by investing in local talent and expanding our workforce, contributing to the broader goals of the Kingdom's Vision 2030.

**• What impact has the SENDAN-SABIC partnership had on local talent development?**

SENDAN's dedication to localisation is evident in its workforce development initiatives and retention policies and strategies.

In collaboration with SABIC and other operating companies, we offer extensive training programmes that equip the local workforce and professionals with essential skills in engineering, construction, and management.

The development of a local Manpower Training and Development Facility in Al-Ahsa further reinforces this commitment.

These programmes provide participants with hands-on experience, ensuring they are well-prepared for challenging roles in the industrial construction sector, thus reducing reliance on foreign expertise.

**• How do SENDAN's modular fabrication, assembly, and testing facilities support localisation and sustainable industrial growth?**

The establishment of our modular fabrication, assembly, and testing facility "TARAKEEB" in Jubail Industrial City is a key move toward localisation. This facility produces prefabricated components for easy on-site assembly, reducing costs and accelerating project timelines. The facility supports the Kingdom's long-term industrial growth by developing local expertise and enhancing the local industrial construction capacity.

Additionally, TARAKEEB integrates eco-friendly practices, such as minimising waste and optimising energy use, contributing to both social and environmental sustainability goals.

This focus on sustainability not only promotes a greener industrial sector but also ensures that SENDAN can meet the growing demands of large-scale projects efficiently.

**• What role does innovation play in SENDAN's projects in the petrochemical sector?**

Innovation is at the heart of SENDAN's contributions to SABIC projects. The company has integrated cutting-edge technologies, such as automated welding systems and digital tools, to improve precision, reduce costs, and streamline project execution.

Our focus on innovation also extends to project management strategies, ensuring that the company remains at the forefront of the industry and meets international standards in project delivery.

**• How does SENDAN's procurement strategy reinforce localisation?**

SENDAN's procurement strategy aligns with SABIC's goals of boosting localisation and self-sufficiency by supporting local suppliers and manufacturers, reducing reliance on imports, and strengthening the local economy.

This approach fosters collaboration with homegrown businesses and supports national initiatives like the Local Content and Government Procurement Authority (LCGPA) and the "Made in Saudi" programme. By ensuring that industrial development benefits local enterprises, SENDAN contributes to a more self-sufficient and resilient economy, advancing Saudi Arabia's Vision 2030 for economic diversification and sustainable growth.


SENDAN has broadened its service portfolio to ensure efficient and timely project execution

SENDAN is a key player in important industrial projects

# Setting new standards in liquid transportation

AS Saudi Arabia's leading provider of commercial vehicles and transport solutions, JuffaliTrucks continues to redefine industry standards with its wide range of high-performance products.

Among its most cutting-edge offerings are the aluminum tank rigged and aluminum tank trailer, two innovations that enhance fuel transportation's safety, efficiency, and cost-effectiveness.

These aluminum tanks represent JuffaliTrucks' commitment to meeting the evolving needs of its clients while aligning with global trends toward lightweight, durable, and environment-friendly transportation solutions.

JuffaliTrucks continues to set the standard for excellence in the commercial vehicle market

## A LEGACY OF INNOVATION

Since its establishment in 2018, JuffaliTrucks has built a reputation for providing comprehensive solutions to the transportation industry.

From importing pre-owned Mercedes-Benz trucks to offering a vast array of trailers and applications, the company has become a trusted partner for businesses across Saudi Arabia.

With a strong focus on innovation and customer-centric services, JuffaliTrucks has expanded its product range to include high-performance aluminum tanks, marking a new chapter in its journey.

The power of aluminum is a game-changer for fuel transportation. Aluminum tankers have become the gold standard for fuel and liquid transportation due to their many advantages over traditional steel tanks.

JuffaliTrucks recognises this industry shift and proudly offers an aluminum tank trailer and aluminum tank rigged to cater to the increasing demand for lightweight, durable, and efficient transportation solutions.

## ALUMINUM TANK TRAILER: LIGHTWEIGHT & EFFICIENT

The aluminum tank trailer from JuffaliTrucks is specifically designed to safely and efficiently transport fuel, chemicals, and other liquid commodities. It is built with advanced aluminum materials, which offer a range of benefits:

- **Lightweight construction:** One of aluminum's primary advantages is its significantly lower weight than steel. This reduces fuel consumption for the towing vehicle, making the operation more cost-effective.
- **Increased payload capacity**: Due to its lightweight structure, the aluminum tank trailer can carry more liquid cargo without exceeding weight restrictions, enhancing business productivity and profitability.
- **Corrosion resistance:** Aluminum naturally resists rust and corrosion, making it ideal for transporting corrosive liquids and chemicals. This resistance ensures the tank's longevity and reduces the need for frequent maintenance.
- **Enhanced mneuverability:** The trailer's lighter weight improves its maneuverability, allowing it to operate in diverse environments, including urban areas, tight spaces, and rough terrain.
- **Safety and compliance:** The aluminum tank trailer is designed to meet the highest safety standards, ensuring compliance with Saudi regulations for hazardous and non-hazardous liquid transportation.

Heiko Schulze, JCV CEO

## ALUMINUM TANK RIGGED: STRENGTH & VERSATILITY

The aluminum tank-rigged is another innovation from JuffaliTrucks that combines strength, durability, and efficiency for maximum performance in liquid transport.

Unlike the trailer, which is towed, the tank-rigged is mounted on a truck chassis, providing an integrated and compact solution for businesses that need a standalone unit.

The key features include:

- **Integrated design:** The aluminum tank rigged is mounted directly onto the truck, creating a cohesive unit. This design improves stability during transport and allows for more effortless operation in challenging terrain.
- **Durability and strength:** Aluminum's inherent strength ensures the tank rigged can withstand harsh working conditions while remaining resistant to corrosion, ensuring a long-lasting, reliable investment.
- **Flexible applications:** The tank rigged is versatile and suitable for various industries, including fuel distribution, water delivery, and chemical transport.
- **Fuel efficiency:** Aluminum's lighter weight contributes to better fuel efficiency for the truck, lowering operational costs over time.
- **Compliance and safety:** As with the aluminum trailer, the tank rigged meets or exceeds all regulatory safety standards, ensuring safe transport of hazardous and non-hazardous liquids.

## WHY CHOOSE JUFFALITRUCKS ALUMINUM TANKERS?

JuffaliTrucks has invested in state-of-the-art manufacturing and design to produce aluminum tank trailers and rigids that offer a unique combination of safety, efficiency, and durability. For customers, this translates into:

- **Cost savings:** Aluminum's lightweight nature reduces fuel consumption and increases payload capacity, resulting in significant operational savings.
- **Longer lifespan:** Aluminum's corrosion resistance ensures that the tank trailer and rigid last longer, requiring less frequent maintenance and repairs.
- **Enhanced safety:** JuffaliTrucks' commitment to safety ensures that all tanks are designed to minimise risks during transport, protecting both the driver and the environment.
- **Environmental impact:** By improving fuel efficiency and reducing emissions, JuffaliTrucks' aluminum tank solutions contribute to a greener and more sustainable transportation industry.

## SUPPORTING SAUDI ARABIA'S VISION 2030

JuffaliTrucks' introduction of aluminum tankers aligns with Saudi Arabia's Vision 2030, which prioritises sustainability, innovation, and economic diversification.

The lighter weight and increased fuel efficiency of these aluminum tanks directly contribute to reducing carbon emissions, supporting the Kingdom's broader environmental goals.

Heiko Schulze, JCV CEO, emphasises the importance of the company's latest advancements: "The introduction of our wide range of trailers and applications reinforces our commitment to providing innovative and reliable solutions for our customers. This significant milestone marks our dedication to excellence and sets a new standard in the Saudi market."

According to Mohammed Alwardat, Director of JuffaliTrucks: "The introduction of our extensive range of trailers and applications is a testament to our commitment to delivering top-notch solutions to our customers. Our journey began in 2018 with importing used Mercedes-Benz trucks from Europe. Now, by integrating advanced trailers and applications into our offerings, we continue to innovate and meet the evolving needs of our clients. We have unwavering faith in our group's ability to exceed customer expectations. JuffaliTrucks operates as a united team, working tirelessly to ensure the highest levels of customer satisfaction, making it seamless to serve all our clients."

## CONCLUSION

JuffaliTrucks continues to set the standard for excellence in the commercial vehicle market by offering cutting-edge solutions such as the aluminum tank trailer and aluminum tank rigged.

These products meet the demanding requirements of fuel and liquid transportation and provide significant advantages in terms of cost-efficiency, durability, and sustainability.

With a strong focus on innovation and customer satisfaction, JuffaliTrucks remains a trusted partner for businesses looking to optimise their logistics operations.

As the transportation industry evolves, JuffaliTrucks will continue to be at the forefront, offering groundbreaking products that set new benchmarks for performance, safety, and efficiency.

An aluminum tank rigged can withstand harsh working conditions

An aluminum tank trailer reduces fuel consumption for the towing vehicle

Mohammed Alwardat, Director of JuffaliTrucks

# JAL International: Pioneering Kingdom's industrial future

**The company is a leader in KSA's petrochemical, fertiliser, steel, mining, power and utility sectors and drives Vision 2030 through innovation, strategic partnerships, and comprehensive services, advancing technology, industry, and sustainability**

WITH over 35 years of industry leadership, JAL International is a pivotal force in Saudi Arabia's petrochemical, fertiliser, steel, mining, power, and utility sectors, significantly influencing the Kingdom's economic transformation under Vision 2030.

The company is renowned for its strategic alliances with major players such as Saudi Aramco, SABIC, Ma'aden, and NEOM, and its commitment to technological innovation and local development.

Through these efforts, JAL International is shaping the future of industrial services in Saudi Arabia, driving progress through advanced solutions and sustainable practices.

The CEO of JAL International emphasises the importance of partnerships, stating: "Our alliances with key industry players are crucial for driving the technological advancements that shape the future of our sector."

The company offers a broad range of specialised services tailored to the oil and gas, petrochemical, fertiliser, steel, mining, power, and utility sectors.

JAL International provides comprehensive engineering, procurement, and construction (EPC) services, delivering turnkey solutions for facilities with expertise in mechanical, civil, electrical, instrumentation, fire, and analyser systems.

This focus ensures that all projects meet the highest standards of quality. Currently, JAL is involved in global construction contracts with SABIC, Ma'aden, and SATORP.

Additionally, its advanced electrical and instrumentation services enhance operational efficiency and safety, incorporating sophisticated system integration and automation, including DCS, PLC, and RTU systems.

The company has executed major DCS revamping, system integration, and substation revamping projects with various petrochemical firms in Jubail and Yanbu.

JAL International also undertakes plant shutdown services related to electrical and instrumentation needs and is actively engaged in shutdown services for SABIC, Sadara, SATORP, and Samref.

Furthermore, it extends its EPC services to include substations up to 132 KV, encompassing comprehensive testing and commissioning, with multiple projects currently underway with the Saudi Electricity Company.

In specialised civil construction, the company leads in site preparation, excavation, grading, and drainage.

Its fabrication services cater to the oil and gas, petrochemical, fertiliser, steel, mining, power, and utility sectors, covering both structural and pipe spool fabrication.

Moreover, JAL International is an HCIS-certified contractor with extensive experience in designing, supplying, installing, testing, and commissioning various fire protection, detection, and suppression systems.

The company also excels in integrated facility management services, providing innovative solutions across Saudi Arabia that emphasise productivity and comfort through a combination of soft, hard, and specialised services.

In addition, its operations and maintenance (O&M) support services stand out by offering comprehensive support in engineering, project management, construction, inspection, safety, environmental, and quality control areas, alongside plant shutdown services.


The JAL International team

In response to the increasing demands in Saudi Arabia, JAL International has significantly expanded its manufacturing and service capabilities, boosting production capacity for electrical control protection panels and SCADA and automation panels to reduce lead times and enhance quality.

The company's modern fabrication services now focus on critical components like pressure vessels, skids, and analyser shelters to improve reliability.

The CEO remarks: "Our enhanced manufacturing capabilities are a testament to our commitment to quality and efficiency, ensuring that we meet the growing demands of the industry."

In partnership with Contract Resources from New Zealand, JAL International has also enhanced its plant maintenance services, including the establishment of a catalyst loading and unloading training facility in Jubail Industrial City.

Its facility management services have grown to incorporate advanced technical capabilities, implementing CAFM, AI, IoT, and robotics to enhance efficiency across Saudi Arabia.

Remaining at the forefront of technological innovation in the oil and gas, petrochemical, fertiliser, steel, mining, power, and utility sectors, JAL International deploys advanced automation systems and digital twin technology to facilitate predictive maintenance and real-time monitoring.

The integration of SAP S/4HANA streamlines process management within the company, while the adoption of green technologies, including solar power and energy-efficient designs, underscores its commitment to minimising environmental impact.

Additionally, the incorporation of CAFM, IoT, and AI technologies optimises facility management and decision-making processes.

Looking ahead, JAL International is actively engaged in several high-profile projects crucial to Saudi Arabia's energy and industrial sectors, focusing on strategic areas such as green energy and carbon capture, integrated facility management services, and automation and infrastructure projects.

Its commitment to the In-Kingdom Total Value Add (iktva) programme drives its strategy, emphasising local manufacturing, workforce localisation, supply chain development, and training.

JAL International has established training centers in Dammam and Jubail to enhance the skills of local engineers and technicians, aligning with Saudisation goals.

The Chairman of JAL International states: "Our investment in local talent and training is essential to our strategy of contributing to the Kingdom's economic development and workforce localisation."

JAL International's fabrication facility in Jubail

JAL International aspires to be the premier provider of integrated solutions for Saudi Arabia's energy and industrial sectors, with a growth strategy that includes geographic expansion into new GCC markets such as the UAE, Kuwait, and Bahrain, as well as diversifying services to incorporate advanced technological solutions.

The company also aims to forge strategic partnerships with international firms to bring innovative solutions to Saudi Arabia. In addition to its core operations, JAL International's sister companies contribute significantly to its success.

JAL Human Resources Company (JHR), established in 2014, stands out as a premier workforce solution provider in Saudi Arabia, holding the prestigious accreditation as a Saudi Ministry of Labor licensed "Mega Workforce Services Company" with License No 18.

JHR is dedicated to delivering top-notch services, specialising in providing well-qualified human resources, covering temporary staffing, permanent placement, and workforce management tailored to meet both corporate and domestic clients' needs. Located in Al Khobar, within the eastern province of Saudi Arabia, the head office serves as a strategic base.

Meanwhile, JACR Petroleum & Industrial Services Company (JACR), a joint venture with New Zealand's Contract Resources established in 2012, excels in specialised industrial services including catalyst handling, chemical cleaning, decontamination, furnace decoking, high-pressure water blasting, tank cleaning, sludge management, and mechanical services.

As JAL International continues to navigate the evolving landscape of the oil, gas, petrochemical, fertiliser, steel, mining, power, and utility industry, its legacy of resilience, innovation, and strategic vision positions it for ongoing success.

The company remains committed to supporting Saudi Arabia's economic transformation and global energy leadership, with a strong foundation, innovative approach, and dedication to sustainability driving its future endeavours.

Compared with traditional flame detection systems, companies have reported significant reductions in false alarms through artificial neural networks, leading to enhanced operational continuity and improved worker safety

# Advanced diagnostics reduce false alarms in flame detectors

IN industrial settings where flammable materials are prevalent, flame detection systems play a pivotal role in ensuring safety.

These systems act as an essential component of comprehensive safety programmes, designed to identify the presence of flames early to prevent catastrophic fires and explosions.

However, the challenge of false alarms poses a significant threat to operational efficiency, often leading to unnecessary disruptions and potentially desensitizing personnel to genuine alerts.

As industries strive for enhanced safety, understanding the various flame detection technologies becomes imperative.

Traditional flame detection methods, including infrared (IR) and ultraviolet (UV) sensors, have been widely used to monitor flames. Yet, these systems are not without limitations; they can be susceptible to interference from environmental factors such as sunlight, dust, and smoke, says Kevin Killeen, the Global Product Line Manager for Flame Detection at MSA Safety.

This vulnerability increases the risk of false alarms, making it challenging for operators to differentiate between real threats and benign triggers.

As a result, the need for more advanced, reliable solutions has never been greater in industrial environments.

Recent advancements in technology have led to the development of artificial neural networks (ANNs) as a sophisticated approach to flame detection.

These networks, inspired by the human brain's structure, are designed to learn from vast datasets and improve accuracy in identifying genuine flames while minimizing false alarms.

With industries increasingly adopting these advanced diagnostic tools, the focus now shifts to how ANNs are transforming flame detection systems and enhancing safety across various sectors.

Below are excerpts from the interview:


The FL5000 flame detector provides superior false alarm discrimination over long distances

Kevin Killeen

**What is the role of flame detectors in industrial settings and the types of hazards they help prevent?**

In industrial environments where flammable materials are handled, flame detection systems are crucial for safety.

They serve as an essential layer in safety programmes, helping to prevent fires and explosions by detecting the presence of flames early on.

However, false alarms can be a significant issue, disrupting operations and potentially desensitising personnel to real alerts.

Different flame detection methods exhibit varying false alarm profiles depending on the application, which is why advanced diagnostic technologies, like artificial neural networks (ANNs), have been developed to enhance these systems and reduce false alarms.

**What are the challenges faced by traditional flame detection systems?**

Traditional flame detection systems rely on sensors such as infrared (IR) and ultraviolet (UV) detectors to identify flames. These sensors, however, can be prone to interference from sources like sunlight, arc welding, and hot surfaces, which may lead to false alarms.

Environmental factors like dust, smoke, and fog can further limit the effectiveness of flame detectors, making it challenging to distinguish between genuine threats and false alarms.

**How do advanced diagnostic technologies, particularly ANNs, address these challenges?**

ANNs are a powerful solution to these challenges. They are computational models inspired by the structure and function of the human brain, capable of learning complex patterns and making decisions based on vast datasets.

When applied to flame detection, ANNs can discern subtle differences between actual flames and potential sources of interference, significantly reducing false alarms.

**Can you explain how ANNs work in the context of flame detection?**

ANNs are trained using extensive datasets of spectral data from both real flames and common sources of interference.

Through supervised learning, the network adjusts its internal parameters to optimise its ability to accurately classify input data.

Once trained, the ANN can quickly analyse incoming sensor data and determine whether a detected anomaly corresponds to a genuine flame or a false alarm. Since 2005, MSA has been at the forefront of using artificial neural networks in flame detection technology.

**What industries have embraced ANNs for flame detection, and what results have they seen?**

Numerous industries, including oil and gas, chemical processing, and manufacturing, have adopted ANNs for flame detection with remarkable results. By integrating ANNs into their safety systems, companies have reported significant reductions in false alarms, leading to enhanced operational continuity and improved worker safety.

Additionally, the scalability of ANNs allows them to be deployed in diverse environments, from offshore platforms to industrial plants, highlighting their versatility and effectiveness.

**What are the key advantages of using ANNs in flame detection?**

The key advantages of using ANNs in flame detection include:

- **Adaptability:** ANNs can handle varying environmental conditions and sources of interference due to their extensive training library, making them robust in real-world applications.
- **Accuracy:** ANNs leverage sophisticated pattern recognition capabilities to differentiate between genuine flames and false alarms with high precision.
- **Efficiency:** ANNs can process large volumes of data in real-time, enabling rapid decision-making and minimising response times in critical situations.
- **Reduced Maintenance:** With fewer false alarms, flame detection systems that incorporate ANNs require less frequent maintenance, resulting in cost savings and improved operational efficiency.

**Can you introduce us to the latest generation of flame detectors, the General Monitors® FL5000 MSIR Flame Detector?**

The FL5000 Multi-Spectrum Infrared (MSIR) Flame Detector is MSA Safety's latest generation flame detector.

It builds on the foundation set by the FL4000H, with increased neural network capabilities that further reduce false alarms. The proprietary MSIR flame algorithm ensures that the detector verifies the presence of a legitimate flame before initiating an alarm, protecting both assets and budget.

Additionally, the FL5000 is the first flame detector to incorporate Bluetooth technology. With the exclusive Flame Connect App, users can easily set up, configure, and download event logs from mobile devices.

**How do advanced diagnostic technologies, like ANNs, benefit industrial flame detection?**

Advanced diagnostic technologies, especially artificial neural networks, offer excellent accuracy and efficiency in flame detection while minimising false alarms.

By harnessing the power of ANNs, industries can mitigate risks, protect assets, and safeguard personnel.

As technology continues to evolve, the integration of next-generation ANNs is poised to set new benchmarks for excellence in industrial flame detection.

**Finally, regarding the previous model, the FL4000H. Would you recommend users with the FL4000H fleet to think about upgrading their flame detection system with the FL5000 detector?**

Yes, there are quite a few good reasons to consider upgrading. First, the FL5000 was designed with the same footprint as the FL4000H/FlameGard 5 MSIR Flame Detector, making it easy to upgrade without needing to run new conduit or pour new seals. Plus, it uses the existing bracket (P/N 71370-1).

Simply remove the FL4000H optical housing and wiring from the FL4000H relay board, and you can use the FL5000 Upgrade Kit to retrofit your FL4000H flame detector with the new features of the FL5000 and get a new five-year warranty.

Just make sure to check your electrical specifications to ensure the FL5000 meets all the requirements of your current installation, such as maximum power output and wiring distance.

** Kevin Killeen is the Global Product Line Manager for Flame Detection at MSA Safety. He is tasked with the development and maintenance of MSA's Flame Detection products such as the FL500 UVIR and FL5000 MSIR Detectors. He has been with MSA for almost two years and has a further four years of experience in the industrial automation industry, specialising in electrical instrumentation.*

# Ammonia emerges as a key fuel for sustainable shipping

In a report, Wartsila provides a roadmap for the future of sustainable fuels, identifying how the industry can more rapidly and affordably scale these fuels and achieve full decarbonisation by mid-century – within the lifetime of just a single vessel

By ABDULAZIZ KHATTAK

AMMONIA has emerged as a promising alternative fuel as the shipping industry looks for more sustainable fuel options.

With new global regulations having set a clear destination for shipping – net zero emissions by mid-century – ammonia will play a significant role in enabling the shipping industry to reduce its emissions.

A report by Wartsila highlights the role that sustainable fuels will play in achieving this target which is set by the International Maritime Organization (IMO).

According to the report, existing decarbonisation solutions, such as fuel efficiency measures, can cut shipping emissions by up to 27 per cent; however, sustainable fuels, such as ammonia, will be a critical step in eliminating the remaining 73 per cent.

In this context, Hakan Agnevall, President and CEO of Wartsila highlights the importance of cross-industry collaboration.

He says: "In just 25 years – the lifetime of a single vessel – shipping needs to get to net zero emissions. Achieving this will require coordinated action by all maritime industry stakeholders to bring about the system change needed to accept a new generation of sustainable fuels."

Sustainable shipping fuels could reach cost parity with fossil fuels as early as 2035 with the help of decisive emissions policy such as carbon taxes and emissions limits, according to a new report launched today by technology group Wartsila.

The report, titled 'Sustainable fuels for shipping by 2050 – the 3 key elements of success', reveals that the EU Emissions Trading Scheme (ETS) and FuelEU Maritime Initiative (FEUM) will see the cost of using fossil fuels more than double by 2030.

By 2035, they will close the price gap between fossil fuels and sustainable fuels for the very first time.

Transporting 80 per cent of world trade, shipping is the engine room of the global economy.

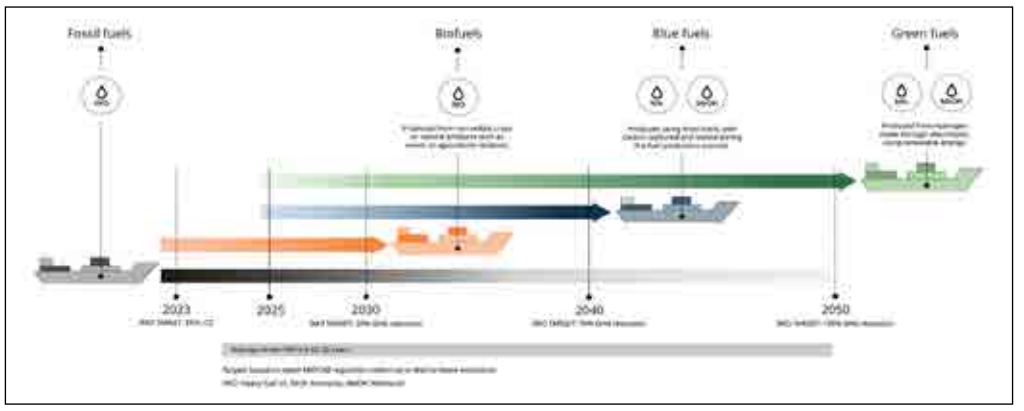



Figure 1 ... sustainable fuels roadmap to 2050

However, despite being the most efficient and environmental way to transport goods, it emits 2 per cent of global emissions, equivalent to the annual emissions of Japan. Without action, this could increase by more than 45 per cent by 2050.

In 2023, the International Maritime Organization (IMO) set a target of achieving net zero emissions by 2050. Existing decarbonisation solutions, such as fuel efficiency measures, could cut up to 27 per cent of emissions.

Wartsila's report argues that sustainable fuels will be a critical step in eliminating the remaining 73 per cent but radical action is needed to scale them.

The industry suffers from a "chicken and egg" challenge – ship owners won't commit to a fuel today that is expensive, only produced in small quantities, and may be usurped by another fuel that scales faster and more affordably. Meanwhile, it is difficult for suppliers to scale production without clear demand signals.

Wartsila has produced new modelling that shows a timeline of which fuels are likely to become widely available on a global scale, when and at what cost.

To accelerate this timeline, the report argues that decisive policy implementation, industry collaboration, and individual operator action must coalesce to scale the production of these fuels.

Roger Holm, President of Wartsila Marine and Executive Vice-President at Wartsila Corporation says: "Achieving net-zero in shipping by 2050 will require all the tools in the toolbox, including sustainable fuels. As an industry, we must focus on coordinating action across policymakers, industry and individual operators to bring about the broad system change required to quickly and affordably produce a mix of sustainable fuels. Policy in Europe is showing just how impactful action at the international level can be, closing the cost gap between fossil- and low-carbon fuels for the first time."

Wartsila's modelling (Figure 1) shows sustainable fuels will be 3-5 times more expensive than today's fossil fuels in 2030.

As ETS and FEUM show, policy is key to closing the price gap. The report argues that policymakers should:

- **Maximise certainty:** Set an internationally agreed science-based pathway for phasing out fossil fuels from the marine sector, in line with IMO targets.
- **Boost cost competitiveness:** Adopt a global industry standard for marine fuel carbon pricing.
- **Collaborate:** Increase global collaboration between governments on the innovation and infrastructure necessary to deliver sustainable fuels at scale worldwide.

## INDUSTRY COLLABORATION

The sector must collaborate with stakeholders from inside and outside shipping. The report calls on industry to:

- **Pool buying power:** Initiate sector-wide procurement agreements to pool demand from multiple shipping operators.
- **Collaborate with other sectors:** Convene with leaders in aviation, heavy transport, and industry to establish a globally recognised framework for the production and allocation of sustainable fuels.
- **Share skills:** Establish an industry-wide knowledge hub for the purpose of sharing expertise, skills and insights.

Every euro an operator saves in fuel costs at today's prices, could be worth 3-5 times that by 2030.

That means companies such as Carnival Corporation, which made a 5-10 per cent efficiency gain through its Service Power Upgrade Program, could cut its fleetwide fuel costs by as much as $750 million per year in 2030.

All operators can benefit from improving the efficiency of their vessels – the technology is readily available today.

Holm adds: "If there is one take away from our report, it is that smaller operators need not feel powerless. They have a major role in accelerating towards net-zero emissions shipping. Taking steps to improve fuel efficiency and invest in fuel flexibility can deliver immediate returns, reducing both emissions and operating costs. But action must be swift – we have the lifecycle of just a single vessel to get this right."

Investing in fuel flexibility is the most financially viable way to avoid the risk of stranded assets.

Wartsila has been developing multiple fuel options. Most recently, Wartsila launched the first commercially available 4-stroke engine for ammonia fuel, which can immediately reduce emissions by over 70 per cent, compared to diesel.

Salt settlement can impact the efficiency of centrifuge equipment. However, a viable solution to prevent this issue is nitrogen puffing, write Turki Alghamdi, Khaled Aljuhany and Pietro Scoppetta from Saudi Aramco in their research

# Nitrogen puffing can prevent salt buildup in centrifuges

MONOETHYLENE Glycol (MEG) is widely used as a dehydration agent in the natural gas industry. In the MEG regeneration process, centrifuge equipment is commonly used to separate salts from the MEG solution.

However, salts settlement can cause significant issues with the efficiency of the centrifuge equipment.

The MEG regeneration process involves several steps aimed at obtaining lean MEG form the rich MEG stream.

Rich MEG is typically received in the MEG regeneration unit from the plant slug catchers and inlet separators. This liquid feed generally contains some dissolved hydrocarbons, CO2, salts and solids.

Filtration removes solid particles and floating impurities from the MEG solution. Degassing and thermal processes leave a stream with concentrated salts.

The separation of the salts from the MEG solution is usually referred to as reclamation. The slurry stream produced in the reclamation is typically fed to a centrifuge to produce a salt cake.

"Centrifugation is the most efficient method for separating salts and impurities from the MEG solution during the regeneration process and is included to enhance the level of recovery of glycol," a research study by Turki Alghamdi, Planning and Performance Management Analyst, Saudi Aramco, Khaled Aljuhany, Project Engineer, Saudi Aramco, and Pietro Scoppetta shows.

## CENTRIFUGATION

During centrifugation, centrifugal force is applied to the slurry that has been obtained by processing of the contaminated MEG solution, causing heavier particles to separate and settle at the bottom of the equipment.

The purified MEG is then recovered along with the regenerated MEG, leaving the separated impurities to be removed later.

However, salts settlement can cause fouling in the centrifuge equipment, reducing its efficiency and leading to unplanned downtime and production losses.

Centrifuges may have different design features. Nevertheless, it is possible to identify a general working principle based on batch operation that comprises the main steps of filling, centrifugation and scraping/discharge.

At the end of a cycle, it is typical of the machine operating procedure to leave a residual heel of salts cake on the basket in order to protect the filtering cloth. This is deliberately done to avoid the scraper to touch (and damage) the filtering cloth.

After several cycles (10 to 15) this residual film affects the filterability efficiency. In other words, the centrate (the liquid that is supposed to be separated) starts to encounter increasing difficulty to pass through the residual heel and cross the basket.

This heel layer then needs to be removed. Inefficient removal of the heel can eventually lead to halt of the operation to allow for operators to intervene and manually clean the basket.

In the most severe scenarios, it can even cause equipment failures with associated downtime.

Periodical removal of the heel is, therefore, important to maintain proper operation of the centrifuge.

A common way to aid the cleaning of the heel is through water washing. This can be automated as part of a Cleaning in Place (CIP) procedure.

However, water cleaning may not be effective enough. Hence, an alternative (or additional) pneumatic cleaning system can be considered

*Salt buildup in centrifuge equipment can cause several problems in the MEG regeneration process, including reduced separation efficiency, equipment failure, and increased maintenance costs*

that typically uses nitrogen supply available in the plant.

## SOLUTION: NITROGEN PUFFING FEATURE

One solution to prevent salts settlement in the centrifuge equipment is to use a nitrogen puffing feature.

Nitrogen puffing is a process in which nitrogen gas is used to prevent salts from settling in the bowl or walls of the centrifuge equipment.

During the process, nitrogen is introduced into the chamber by means of puffing through designed nozzles into the walls of the centrifuge, causing the salts to displace from the walls.

In addition to this system that blows nitrogen from outside of the basket, it may be possible to include also nozzles suitably located on the scraper blade supports in order to blow nitrogen from the basket interior.

The nitrogen blowing process can be automated and integrated in the control steps of the centrifuge.

The details of the solution may slightly differ depending on the centrifuge manufacturer, but the system is not an uncommon feature and the vendors should be able to assist on its most appropriate definition.

The use of nitrogen puffing in centrifuge equipment has several advantages:

- **Improved separation efficiency:** Nitrogen puffing can improve the separation efficiency of the centrifuge equipment by preventing salts settlement, leading to a higher quality MEG solution.
- **Reduced maintenance costs:** The use of nitrogen puffing can reduce maintenance costs by minimising fouling in the equipment, reducing the need for cleaning and replacement. The system is generally relatively inexpensive to include and its cost is expected to be easily offset by Opex improvements.

Khaled Aljuhany

- **Increased equipment life:** Nitrogen puffing can increase the life of the centrifuge equipment by reducing the fouling and wear on the equipment.
- **Increased production capacity:** By preventing salts settlement, nitrogen puffing can increase the production capacity of the MEG regeneration process.

## CONCLUSION

Salt buildup in centrifuge equipment can cause several problems in the MEG regeneration process, including reduced separation efficiency, equipment failure, and increased maintenance costs.

The use of nitrogen puffing in centrifuge equipment can effectively prevent salt buildup, improve separation efficiency, and reduce maintenance costs.

Nitrogen puffing systems can be retrofitted to existing centrifuge equipment, making it a cost-effective solution for improving the performance of MEG regeneration processes.

It is important for companies in the oil and gas industry to consider implementing nitrogen puffing systems in their MEG regeneration processes to improve efficiency and reduce costs.

# Atlas enhances safety with third-party inspections

## The company emphasises the importance of third-party inspections to ensure safety and compliance across various projects, adhering to rigorous international standards for quality and efficiency

THIRD-PARTY inspection services in all projects of construction, infrastructure, maintenance projects, manufacturing and all other premises, everywhere and periodically are crucial for ensuring safety, compliance, and operational efficiency.

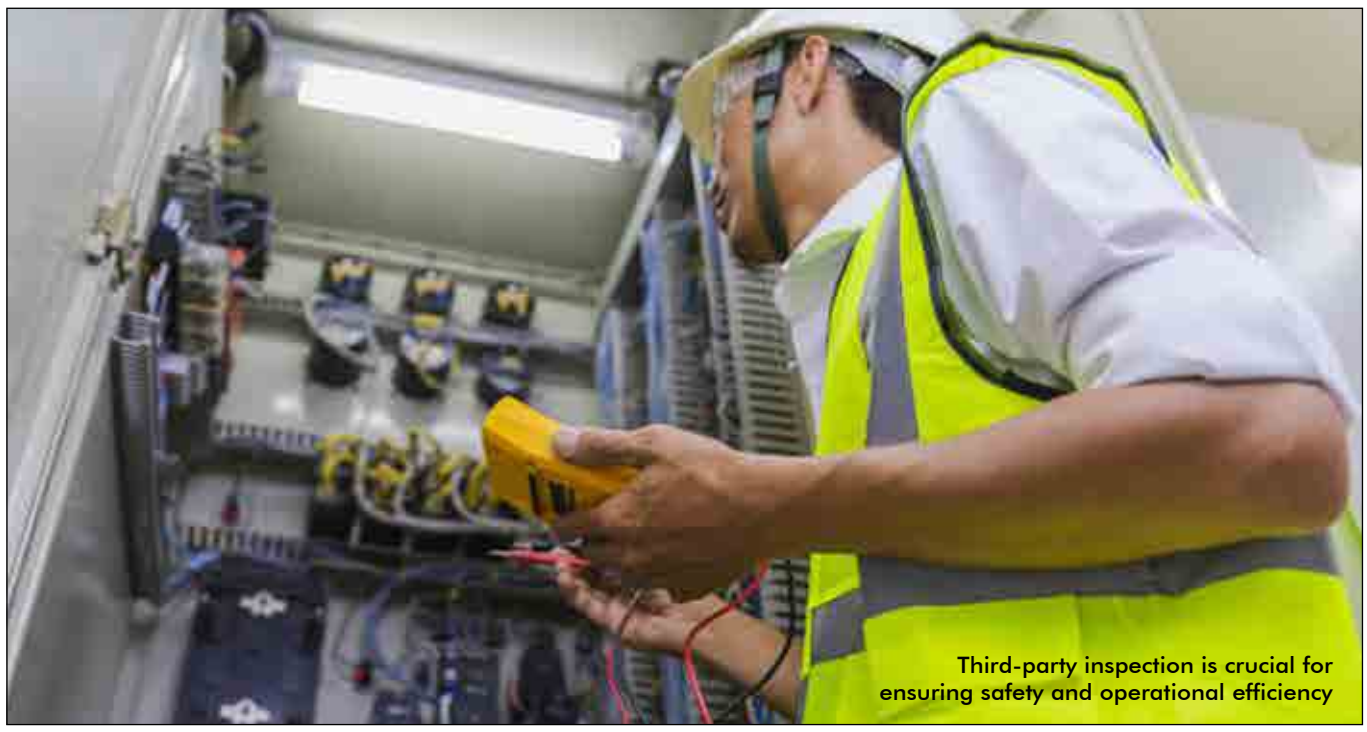
Atlas Support and Services understands the critical importance of a well-designed and expertly service provided in maintaining a safety, productive, energy-efficient environment and assets safety.

"We are committed to delivering exceptional quality of service, considering the ISO /IEC 17020 as a methodology to achieve the ultimate target of the inspection services," says Osama Al Raei, Business Development Manager, Atlas Support and Services.

The company's extensive range of services include third party inspection services as Factory Acceptance Test (FAT), lifting equipment and firefighting systems according to SBC 801 and Civil Defense.

Atlas Support and Services is dedicated to fostering skilled engineers and technicians meticulously to provide material and equipment inspection services to guarantee the seamless performance and durability of every aspect of a project, factory and any premises.

Atlas plans to leverage its expertise in inspection and conformity assessment to advance clean and efficient energy solutions in Saudi Arabia by actively participating as an inspection body at all stages of energy projects.



Third-party inspection is crucial for ensuring safety and operational efficiency

This involves cooperation with executing and contracting companies and serving as a certification body for project inputs subject to Saudi standards.

"Delivering meticulous and comprehensive services is more than just a slogan for Atlas Support and Services; it's a reality. We offer Product Certificates of Conformity in accordance with SFDA and SASO regulations, adhering to ISO/IEC 17065 standards," says Raei.



# GCC non-metallic liner pipes market expands

THE oil and gas industry in the GCC is evolving with the increasing use of non-metallic materials in piping networks.

The use of non-metallic materials in the GCC's oil and gas sector has seen significant growth.

According to a report by Research and Markets, the demand for non-metallic pipes in the oil and gas sector is expected to grow annually 7.2 per cent from 2021 to 2026. This growth is driven by the need for more durable and cost-effective piping solutions.

In the GCC, this trend is driven by advancements in materials technology, particularly the introduction of PE raised temperature (PE-RT) and ethylene tetrafluoroethylene (ETFE). These materials can withstand higher temperatures (up to 85 deg C) than conventional PE pipes.

"Traditional PE pipes have been favoured for their corrosion resistance and flexibility, but their thermal stability has limited their use in higher temperature applications," says Bhaveth Chali, Technical Manager, Muna Noor Manufacturing and Trading.

PE-RT, a modified version of PE, provides improved thermal stability while maintaining the flexibility and chemical resistance of traditional PE.

ETFE, a fluoropolymer, offers exceptional high-temperature resistance, chemical resistance, and mechanical strength, making it suitable for demanding environments in the GCC's oil and gas operations.

PE-RT is typically used for the straight lengths of pipe, providing a durable and flexible solution for extended sections. For more complex geometries and steel spools, ETFE is employed through a process known as roto-lining, which allows the material to evenly coat the internal surfaces of the steel spools.

High-temperature resistant non-metallic liners, such as those made from PE-RT and ETFE, are used within existing steel piping networks to mitigate high-temperature corrosion and thermal degradation.

This practice extends the operational lifespan of steel pipes, reducing the frequency of repairs and replacements.

Temperature-resistant non-metallic liners mitigate corrosion and thermal degradation

Installation of non-metallic liners is also technically advantageous. These liners can be installed with minimal disruption to existing infrastructure, allowing for quick upgrades and reducing downtime.

The flexibility of PE-RT and the durability of ETFE facilitate installation in complex pipeline geometries and difficult-to-reach areas, which is particularly beneficial in offshore and remote locations common in the GCC.

The development of high-temperature resistant non-metallic liner pipes, specifically PE-RT and ETFE, represents a significant technical advancement in the materials used in the GCC's oil and gas sector.

These materials offer enhanced thermal stability and corrosion resistance, extending the life of steel piping networks and improving operational efficiency.

"As the GCC industry continues to innovate, the adoption of these advanced non-metallics is likely to expand, providing a robust technical solution to the challenges of modern pipeline management," says Braden Hwern, Marketing Manager, Muna Noor Manufacturing and Trading.

In the transition to a low-carbon economy, ammonia is rising to prominence as a potential chemical energy carrier, with significant advantages over hydrogen. Anton Tvelenev and Dr Juan Gomez Prado from at KBR Consulting, explore the potential of this molecule to fuel progress towards cleaner, greener energy

# Can ammonia hold the key to decarbonisation?

By ABDULAZIZ KHATTAK


An ammonia plant in Ain Sokhna, Egypt

AMMONIA has garnered significant attention due to several factors, such as its ability to leverage existing ammonia trading infrastructure, lower transportation and handling costs compared to hydrogen and other potential low-carbon hydrogen carrier molecules, as well as its relatively high hydrogen mass content and lack of carbon in its molecular structure.

There are two major advantages of using ammonia over hydrogen. Firstly, ammonia boasts a higher volumetric energy density than hydrogen (with a LHV of 12.7GJ/cu m vs 4.7 GJ/cu m for hydrogen at 700 bar and 8.8 GJ/cu m for liquid hydrogen), albeit still inferior to most hydrocarbon fuels.

Thus, a switch to ammonia rather than hydrogen represents a smaller penalty when it comes to maximum energy storage volumes and the cost of such storage.

The second advantage of ammonia is the option to leverage existing ammonia global trade infrastructure.

Ammonia is a globally traded commodity with a well-established freight, storage, and transshipment infrastructure, certification, and operational standards.

In contrast, hydrogen distribution is presently confined to a few regional piped networks in the US and EU, or specific cluster site distribution networks serving various industrial consumers.

## TECHNICAL CHALLENGES & KEY SAFETY CONSIDERATIONS

Ammonia, however, introduces a distinct set of safety risks compared to conventional fuels.

While it poses a lower fire and explosion hazard than hydrocarbon fuels, its toxic nature and hydrophilic, corrosive properties necessitate the development of entirely new safety protocols if it were to become one of the primary energy carriers for direct fuel use.

Fortunately, the fertiliser industry has accumulated a substantial body of safety knowledge that can be directly applied in this context.

Consequently, the safe handling of ammonia at import and export terminals is well understood, with experienced and trained crews conducting loading and unloading operations.

There are also several key technical challenges associated with direct combustion of ammonia, namely:

- Handling systems will necessitate supplementary layers of protection redundancy and heightened operator training.
- The combustion characteristics of ammonia.
- Nitrogen oxides ($NO_x$) formation.
- Implication on the frequency of refuelling and range.

The above challenges and potential mitigations will dictate the feasibility of ammonia use as a fuel for various major sectors.

## UTILISING AMMONIA AS A FUEL

Ammonia's combination of high energy density and a global mature supply chain, makes it a serious candidate for exploitation as a fuel. There are several emerging applications:

- **Road transportation:** Road transportation contributes approximately 12 per cent of global greenhouse gas (GHG) emissions.

Despite the imperative to decarbonise the road transport sector, there has been limited interest in using ammonia as a fuel due to safety and toxicity concerns, as well as a lack of public awareness regarding safe handling practices.

The one potential area for ammonia use as a fuel may involve industrial long-haul road transport applications, where automated heavy-duty vehicles can operate on routes that avoid large urban areas.


Dr Juan Gomez Prado


Anton Tvelenev

Such solutions will still need to rely on automated long-haul heavy-duty vehicles expected to emerge in the next decade and may not be justified versus hydrogen use.

- **Maritime:** The shipping industry accounts for approximately 1.7 per cent of all GHG emissions.

It presents one of the most challenging sectors to decarbonise due to the number of individual maritime vessels.

The safety aspects associated with ammonia toxicity rule out ammonia use for passenger shipping applications, focussing ammonia use as fuel on industrial freight navigation only.

- **Aviation:** The aviation industry contributes approximately 1.5 per cent of GHG emissions, also making it one of the most challenging sectors to decarbonise.

From a safety perspective, ammonia as an aviation fuel represents a manageable step change.

For the short-term, however, the aviation industry has clearly indicated sustainable aviation fuel as the preferred solution.

Longer term, the aviation sector is tentatively exploring ammonia as a potential future fuel. It is important to note that technological developments for using ammonia as fuel for aircraft engines are at a very early stage of development.

- **Power:** Coal-fired power generation accounts for more than a third of global electricity production and contributes to over 20 per cent of GHG emissions.

Swiftly replacing such a significant portion of the power generation infrastructure with alternative low-carbon options on a globally significant scale in the short- to medium-term is not a feasible expectation.

Hence, there is growing interest in intermediate step solutions. Integrating ammonia as a co-fuel in existing coal-fired power plants emerges as one such solution.

- **Industrial:** Overall, the industrial sector contributes approximately 12 per cent of GHG emissions, primarily through the release of $CO_2$ from its process flue gas stacks.

Direct combustion of ammonia in industrial furnaces is emerging as an appealing and relatively proven alternative technical solution, since it allows for cost-effective storage of low-carbon energy relative to hydrogen or battery storage and avoids the need to invest in an in-situ ammonia cracking unit to generate hydrogen.

## UNDERSTANDING THE TRUE POTENTIAL OF AMMONIA

As an integral component of the 'hydrogen' economy, ammonia is positioned to facilitate low-carbon hydrogen interregional trade and serve as a direct fuel for industrial decarbonisation.

However, its integration into transportation sectors will necessitate comprehensive technology development cycles to mitigate potential safety risks for users.

If we focus solely on technology readiness and the attainment of necessary certifications, without considering the commercial aspects, the following adoption scenario emerges for various uses of ammonia:

- Direct use as a single fuel in industrial boilers is proven and available for operators today.
- Co-firing is ready for commercial operations today.
- New ammonia cracker units are expected to commence operations in the next 3-4 years.
- Development of ammonia gas turbine co-firing is progressing according to its development programme and is expected to be available for retrofitting commercial gas turbine units by the early 2030s.
- Ammonia as a fuel for maritime applications is anticipated to occur at a commercial scale in the latter half of the 2030s.

Overall, and akin to other low-carbon fuel alternatives, the advancement of these potential ammonia fuel applications is expected to hinge on the evolving legislation and global co-operation agreements, as well as the impact of such regulatory changes on the global demand, affordability and corresponding energy trade.

** Anton Tvelenev is Global Petrochemical Director, and Dr Juan Gomez Prado is Head Consultant for Hydrogen and Decarbonisation at KBR Consulting.*

# Unlocking global solutions: The synergy of AI & sustainability

The convergence of AI and sustainability presents a powerful opportunity for businesses to lead the way in addressing climate change and other global challenges, Jonathan Ashton, Head of Marketing and Communications, KROHNE, tells ***OGN***

IN the evolving landscape of corporate responsibility, sustainability has transitioned from a peripheral concern to a central tenet of business strategy.

As a senior corporate affairs professional with a deep interest in the intersection of artificial intelligence (AI) and sustainability, I have observed firsthand how these two forces are reshaping industries.

Today, we stand at a pivotal moment where AI can be the catalyst for addressing some of the world's most pressing challenges, including climate change.

This potential is not just theoretical; it is backed by tangible business opportunities and driven by market demand.

However, to unlock these opportunities, corporate leaders must overcome significant barriers particularly around the measurement of sustainability efforts and embrace AI as a strategic tool.

Companies that embrace AI will lead the charge towards a more sustainable and prosperous future

## AI: THE ENGINE OF SUSTAINABLE INNOVATION

AI is transforming how businesses operate, offering unprecedented capabilities to enhance efficiency, reduce waste, and optimize resource use.

In the context of sustainability, AI's ability to analyse vast amounts of data and generate actionable insights is invaluable.

This is especially true in areas such as predictive analytics, where AI can anticipate environmental risks and enable companies to take proactive measures.

Consider, for instance, the role of AI in optimising supply chains. By predicting demand more accurately and adjusting production schedules accordingly, AI can minimise excess inventory and reduce the environmental impact of manufacturing.

Similarly, AI-driven predictive maintenance can extend the lifespan of machinery, lowering the need for new resources and reducing carbon emissions. These innovations are not just good for the planet; they also make sound business sense, leading to cost savings and enhanced competitiveness.

## BRIDGING THE GAP BETWEEN AMBITION AND ACTION

While the potential of AI is clear, a significant challenge remains: The ability to measure sustainability efforts accurately.

IBM's recent research underscores this issue, revealing that over 50 per cent of C-suite executives view measurement as a major obstacle to achieving their sustainability goals. Without reliable data, it is difficult to set targets, track progress, and demonstrate accountability.

This measurement challenge is not just a technical issue; it is a strategic one. Accurate measurement is the foundation of any sustainability initiative, enabling businesses to quantify their impact and make informed decisions.

However, measurement alone is not enough. The data collected must be actionable, and this is where AI can add significant value.

By integrating AI with advanced measurement technologies, businesses can transform raw data into insights that drive real progress.

At KROHNE, we have long recognised the importance of precise and reliable measurement solutions.

Our advanced technologies provide the accuracy needed to support sustainability initiatives across most industries.

By combining these capabilities with AI, we empower businesses to move from intention to impact, turning sustainability goals into measurable outcomes.

## LEADERSHIP & COLLABORATION: THE KEYS TO UNLOCKING AI'S POTENTIAL

Achieving meaningful progress in sustainability requires more than just technology; it demands leadership and collaboration.

Corporate leaders must champion the integration of AI into their sustainability strategies, setting clear goals and fostering a culture of innovation.

This leadership is essential for overcoming the perceived complexities of AI and ensuring that its benefits are accessible to all parts of the organisation.

But leadership does not operate in a vacuum. It thrives in an environment of collaboration, where diverse voices and perspectives come together to solve complex problems.

This is where platforms like the American Chamber of Commerce (AmCham) in Dubai play a crucial role.

Under the guidance of Cara Nazari, CEO, AmCham Dubai has become a hub for cross-industry dialogue on sustainability.

Through initiatives like the Sustainability Committee, chaired by 3M's Miki Hirasawa Ashton and GE's Sandra Helayel, AmCham has brought together leaders from various sectors to share best practices, identify common challenges, and co-create solutions.

The Sustainability Committee is a testament to the power of collaboration. By bringing together diverse voices, alongside Joelle Jamal and the powerful private sector-focused UN Global Compact, it has facilitated the exchange of ideas and the development of innovative strategies that no single organisation could achieve on its own.

This collaborative approach is essential for tackling the complex, global challenge of sustainability. It ensures that solutions are not only innovative but also inclusive, reflecting the needs and insights of all stakeholders.

## THE FUTURE OF AI & SUSTAINABILITY: A CALL TO ACTION

As we look to the future, the convergence of AI and sustainability presents a powerful opportunity for businesses to lead the way in addressing climate change and other global challenges.

However, realising this potential requires a concerted effort from corporate leaders. It demands a willingness to embrace new technologies, to invest in the skills and capabilities needed to harness AI, and to engage in meaningful collaboration with a diverse range of partners.

The path forward is clear: AI can be a transformative force for sustainability, but only if we are bold enough to seize the opportunity.

This means moving beyond the status quo, challenging existing practices, and reimagining what is possible.

It means setting ambitious goals, measuring progress with precision, and holding ourselves accountable to the highest standards.

We must see the business of sustainability as more than simply mitigating risk; it is about creating shared value and driving long-term growth.

Companies that embrace AI and advanced measurement technologies will be at the forefront of this new era, leading the charge towards a more sustainable and prosperous future.

Together, with strong leadership and collaborative action, we can turn the promise of AI into a reality and build a better world for future generations.