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HORMUZ CRISIS 'GOES FAR BEYOND CRUDE SUPPLY'

Extended recovery timelines and resilience investments reshape energy security planning

THE closure of the Strait of Hormuz has underscored the extent to which a disruption in a single strategic waterway can reverberate across the global economy, affecting energy markets, industrial supply chains, inflation, transport and economic growth long after hostilities end.

Speaking about the crisis, Dr Sultan Al Jaber, UAE Minister of Industry and Advanced Technology and Managing Director and Group CEO of ADNOC, warned that the consequences extend far beyond oil, according to the report.

"And Hormuz as we all know it is not just an oil story. It is in fact an everything story," Al Jaber told Atlantic Council in a virtually interview, noting the impact on LNG, jet fuel, fertilisers, ammonia, urea, aluminium, helium, critical minerals, plastics, consumer goods and broader cargo flows.

The disruption has pushed fuel prices up 30 per cent, fertiliser prices up 50 per cent and airfares up 25 per cent, while the global growth outlook for 2026 has been reduced to 3.1 per cent and inflation has exceeded 4 per cent.

The scale of the challenge is reflected in the policy response. More than 80 countries have introduced emergency economic measures since the conflict began.

Iran is making attempts to set up a permanent system to control the movement of ships through the strait and is reported to have introduced a toll for the vessels transiting.

This has been met by serious opposition from the Gulf states and the US.

Al Jaber stressed that even an immediate end to hostilities would not restore normal trade patterns quickly, estimating that it would take, at least, four months to recover 80 per cent of pre-conflict flows, with full recovery unlikely before the Q1 or Q2 2027.

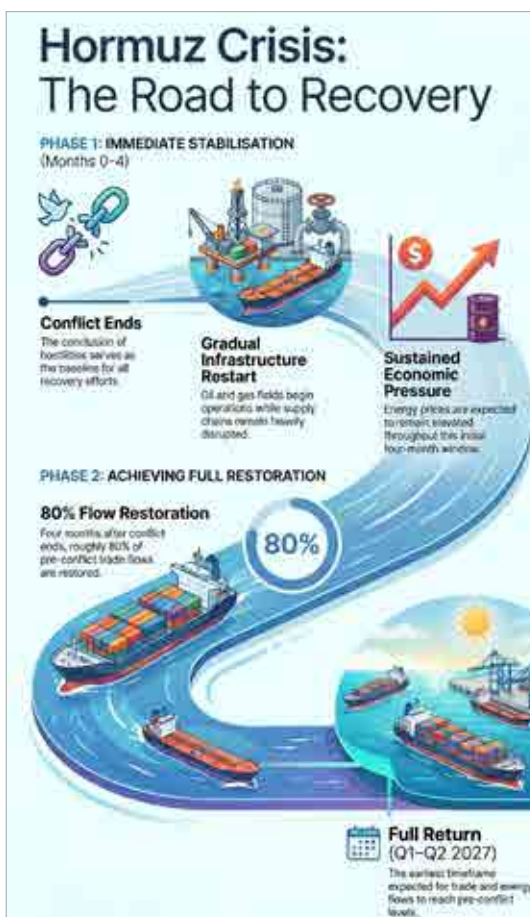
The Strait of Hormuz handles around 20 per cent of global oil and LNG supply, and damage to production and export infrastructure has compounded disruptions.

In Qatar, missile strikes on the Ras Laffan liquefaction complex rendered roughly 3 per cent of global LNG capacity inoperable.

Colby Connelly, Senior Fellow at the Middle East Institute, says the reopening of the waterway alone would not immediately restore supplies.



Dr Sultan Al Jaber speaking with Atlantic Council



"Even after the waterway reopens, supply disruption will continue because restarting oil and gas fields is technically complex and can take months rather than days," he says.

"As a result, energy prices are likely to remain significantly elevated from pre-war levels well after the conflict ends."

Others industry leaders have also highlighted the operational realities of restarting production.

In March, Sheikh Nawaf Al Sabah, Chief Executive of Kuwait Petroleum Corporation, told CERWeek 2026 virtually that Kuwait would require three to four months to fully restore production.

The crisis has strengthened the case for resilience-focused investment across the energy sector.

Al Jaber described resilience as a "critical success factor", arguing that infrastructure capable of maintaining flows during disruptions becomes invaluable when crises emerge.

The UAE's decision more than a decade ago to invest in export infrastructure bypassing Hormuz, including a second pipeline now nearly 50 per cent complete and targeted for accelerated delivery by 2027, reflects that strategy.

The future energy security will depend increasingly on diversified infrastructure, alternative export routes, efficiency improvements and more realistic risk planning.

Existing bypass routes in Saudi Arabia and the UAE have proven critical lifelines during the conflict, reinforcing a broader lesson that the cost of redundancy may be substantial, but the economic consequences of insufficient resilience can be far greater. ■

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SABIC's Saudi Kayan manufacturing site in Jubail, Saudi Arabia



SABIC SPEARHEADS MASSIVE SUPPLY CHAIN RESTRUCTURING

Executing targeted portfolio optimisation and strategic growth initiatives allows the company to capture emerging market demand while navigating persistent global macroeconomic headwinds

BY ABDULAZIZ KHATTAK

SABIC, the Saudi global chemical leader, is driving global supply chain realignment amidst unprecedented industrial fragmentation and market volatility.

The global petrochemical sector is transitioning from post-pandemic recovery into a landscape defined by economic fragility, trade fragmentation, and intense margin compression.

Macroeconomic dynamics, including historical restrictive monetary policies, persistent core inflation in developed economies, and structural oversupply from aggressive capacity additions in China and the US, have exerted significant downward pressure on global petrochemical pricing.

In response to these challenging conditions, the regional landscape has shifted towards regional blocs, with businesses prioritising local-

ised manufacturing and supply chain resilience over traditional cost-optimisation models.

For industry participants, navigating this era of economic divergence requires clear financial objectives, structural efficiency improvements, and disciplined capital allocation to underwrite long-term commercial survival.

SABIC has adapted to these headwinds by executing a tripartite corporate strategy centred on portfolio optimisation, corporate transformation, and selective growth.

Operating across 44 countries with over 26,000 employees and 60 production sites serving over 140 markets, the company has consolidated its identity as a global leader in chemicals, polymers, and agri-nutrients.

As of December 31, 2025, the company maintained an A+ credit rating and a patent portfolio exceeding 10,700 accredited patents, introducing 148 new product applications during the year while recording a total production vol-

ume of 55.5 million metric tonnes.

With total assets of SAR244.29 billion (\$65.14 billion), the company generated \$31 billion in sales revenue for 2025, representing a modest 1 per cent year-on-year decline due to lower average selling prices.

The strategic pivot accelerated rapidly into the first quarter of 2026, where the company recorded a revenue of \$6.97 billion, representing a 6 per cent quarter-on-quarter decrease.

CAPITAL ALLOCATION & ASSET OPTIMISATION

To enhance structural capital allocation and fortify long-term financial resilience, the company finalised two major divestment agreements at the start of 2026, targeting the complete exit of its European petrochemicals business and its engineering thermoplastics business in the Americas and Europe.

These segments were designated as discontinued operations in financial reporting, freeing up critical resources



to be reallocated toward advantaged asset-product-market combinations.

Concurrently, capital deployment has focused heavily on selective growth within high-margin geographies, primarily evidenced by the SABIC Fujian integrated petrochemicals complex in China.

This asset, representing a \$6.4 billion investment, advanced systematically through its execution schedule to reach approximately 98 per cent completion by the end of the first quarter of 2026, positioning the company to capture downstream demand within the expanding Asian industrial production sector.

Domestic manufacturing capabilities inside Saudi Arabia underwent substantial scale expansions throughout 2025 via targeted debottlenecking and technology integration.

The company commissioned the Low Temperature Recovery System (LTRS-1) at the Ibn Zahr facility, optimising C3 and C4 hydrocarbon streams to achieve a 99 per cent feedstock recovery rate, which effectively added 50 kilotonnes of annual methyl tert-butyl ether (MTBE) production capacity.

Simultaneously, the organisation upscaled the MTBE plant at Petrokemya utilising proprietary technologies.

This engineering deployment established one of the largest single-train MTBE production lines globally, effectively doubling its prior operating baseline to achieve a combined annual capacity of approximately one million metric tonnes per annum.

Reliability across other chemical verticals was reinforced by install-

ing a permanent antioxidant dosing system for 2-ethylhexanol, preserving product quality metrics against high summer temperature peaks.

Technical capacity upgrades also targeted specialised chemical catalyst production to insulate regional supply chains from external disruption.

Scientific Design fully commercialised the SynDox 468 catalyst, which expanded operating lifetimes and enhanced synthesis performance margins.

Furthermore, a new BuCat catalyst production plant was commissioned at the Petrokemya site, directly scaling up manufacturing volumes to support internal linear alpha olefins businesses alongside external local and global market demand.

The corporate transformation programme delivered substantial technical returns, yielding a 40 per cent year-on-year improvement in total manufacturing plant reliability across the global network during 2025.

TECHNOLOGY COMMERCIALISATION UNDERPINS CIRCULAR CARBON ECONOMY

The regulatory and commercial push toward decarbonisation has converted the corporate innovation agenda into a mechanism for product differentiation, utilising the frameworks of a circular carbon economy to synthesise lower-carbon-intensity alternatives.

A primary milestone was established via the first commercial sale of certified low-carbon methanol, generated by capturing and converting byproduct carbon dioxide emissions.

The organisation subsequently secured formal certification for low-carbon methyl methacrylate (MMA), establishing a sustainable material pathway for automotive, coatings, adhesives, and construction applications by utilising low-carbon methanol formulated from captured carbon dioxide.

Downstream product validation extended into the glycols vertical, where the United ethylene glycol plant in Jubail successfully manufactured circular chemicals utilising captured carbon dioxide streams.

The resulting glycols and linear alpha olefins lines obtained formal TÜV Rheinland certification for their product carbon footprints, verifying full compliance with Together for Sustainability (TfS) and ISO 14067 protocols.

This was supplemented by obtaining ISCC CFC certification for glycols, confirming the quantitative avoidance of carbon dioxide emissions through raw material substitution.

In parallel, scientific design advanced sustainable ethylene oxide and ethylene glycol technologies featuring integrated carbon dioxide purification modules, demonstrating the technical capacity to lower baseline production emissions by up to 40 per cent.

Specialty chemical formulations were expanded via investments at

the Saudi Kayan complex, where a new polyethylene glycol (PEG) facility commenced operations.

This asset expanded the ethoxylates portfolio through the production of high-molecular-weight polyethylene glycols (HMW PEGs) tailored for the specialised personal care and pharmaceutical sectors.

These advanced materials portfolios achieved external validation, marked by the R&D 100 Award for a fire-retardant, fibre-filled polypropylene composite applied in electric vehicle battery enclosures, alongside six separate material innovations securing Edison Awards.

NATIONAL INDUSTRIAL ALIGNMENT SECURES DOMESTIC MARKET EXPANSION

The economic decision-making behind domestic capital projects is explicitly tied to Saudi Vision 2030 and the National Industrial Strategy, with the company functioning as the national chemicals champion to drive local content development and industrial multiplication.

During 2025, the firm directed 56 per cent of its total procurement and operational expenditures into the domestic economy, a metric validated by its official local content score.

This localisation framework was reinforced by the formal receipt of the local content certificate from the Local Content and Government Procurement Authority (LCGPA), which audited the 2024 financial statements to confirm the baseline credibility of the NUSANED localisation initiative.

Strategic integration with the domestic industrial ecosystem advanced through a major regulatory milestone in early 2026, when the Ministry of Energy granted formal feedstock-allocation approval for an expansion of domestic fertiliser infrastructure.

This regulatory authorisation enables a potential 54 per cent capacity increase in annual urea production, raising the baseline from approximately 4.8 million metric tonnes to 7.4 million metric tonnes, positioning SABIC Agri-Nutrients as a national champion in the global nitrogenous fertiliser market.

To further cultivate local downstream supply chains, the company signed a strategic agreement with the Public Investment Fund (PIF)-Pirelli joint venture, facilitating the domestic manufacture of 3.5 million tires annually within Saudi Arabia and directly advancing the commercial targets of the NUSANED programme.

Industrial integration also involved direct physical infrastructure linkups and cross-stream utilisation projects with national partners.

The company partnered with a local downstream producer to tie directly into its benzene pipeline network, establishing the foundation for a long-term supply agreement to satisfy domestic benzene demand.

Furthermore, the company and other Saudi Aramco affiliates commissioned shared infrastructure across the east and west coasts of Saudi Arabia, enabling the commercial capture and conversion of pyrolysis oils into higher-value chemical applications.

MACROECONOMIC HEADWINDS & OPERATIONAL RATIONALISATION DICTATE OUTLOOK FOR 2026

The global chemical industry enters 2026 under cautious operating assumptions, as cumulative global supply additions are projected to continuously outpace aggregate demand growth.

The macroeconomic environment indicates a period of low-growth stabilisation, where the delayed impacts of protectionist industrial trade policies and lingering fiscal consolidations will continue to suppress consumer spending and large-scale capital investments.

These suppressed margins and elevated historical feedstock costs are expected to trigger a phase of necessary global asset rationalisation, driving the closure of older, inefficient production lines across Europe and Asia.

Industrial output within the US will likely remain constrained by trade barriers and rising material input costs, while the European Union continues to manage the structural impacts of elevated energy costs and softened industrial export demand.

This slowdown across major Western industrial economies is anticipated to decelerate production growth rates throughout Asia, even though India, China, and Southeast Asia remain the primary long-term engines of global chemical demand.

Feedstock dynamics are expected to mirror this regionalisation; for instance, Chinese industrial buyers are actively diversifying their supply chains away from US liquefied petroleum gases due to tariff policy uncertainty, shifting their long-term sourcing requirements toward the Arabian Gulf.

To insulate its financial structure from these macro-systemic risks, the organisation has extended its corporate transformation timelines through the deployment of an upgraded enterprise resource planning platform.

This digital infrastructure integrates institutional workflows to enable the broadened application of artificial intelligence (AI) across production, procurement, and logistical networks, building upon the hundreds of artificial intelligence applications already operational in 2025.

The company has established a long-term local content target framework extending through 2040 to maintain alignment with the Saudi National Industrial Strategy (NIS), focusing future domestic capital expenditure on strengthening value-chain linkages, scaling proven technologies, and protecting corporate financial performance throughout the down-cycle. ■

SABIC strengthens polymers position through innovation

Amid persistent market pressures, the company has expanded polymer solutions across infrastructure, electronics, automotive, healthcare and renewable energy markets to reinforce competitiveness

THE global polymers industry remained under pressure throughout 2025 as structural oversupply, weaker demand growth and tariff-driven disruptions continued to weigh on pricing and market activity.

Against this backdrop, SABIC pursued a strategy centred on product differentiation, deeper value-chain engagement and targeted innovation, strengthening its position across infrastructure, electronics, automotive, healthcare and renewable energy applications.

The company focused on advancing initiatives that reinforced market presence while addressing customer requirements for durability, sustainability, operational efficiency and regulatory compliance.

Its portfolio spans polyethylene, polypropylene, polycarbonate, elastomers, polyethylene terephthalate, polystyrene and polyvinyl chloride, alongside specialised materials including Ultem, Siltem, Extem, LNP and Noryl product families.

INFRASTRUCTURE APPLICATIONS DRIVE DIFFERENTIATED GROWTH

Building and construction remained a key focus area as SABIC expanded specialised polymer solutions designed to improve operational performance and support large-scale infrastructure projects.

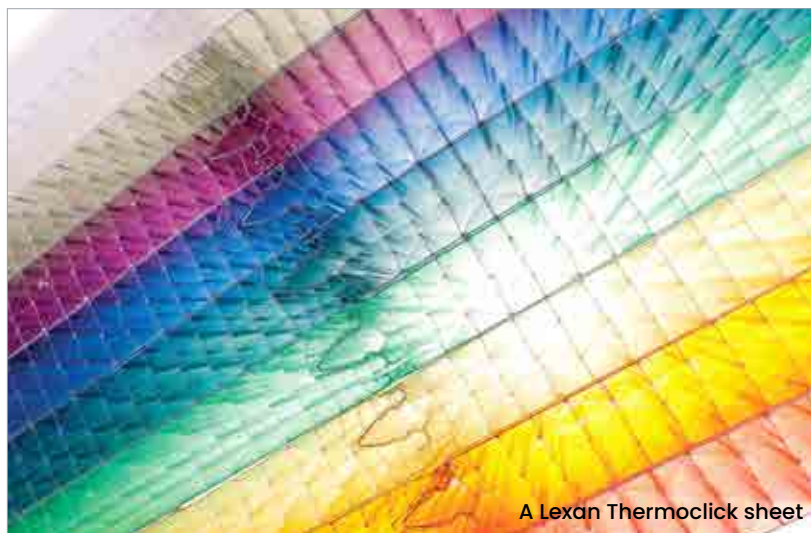
A significant milestone was achieved through the installation of SABIC's polyethylene PE100 reinforced thermoplastic pipe solution beneath the South China Sea.

Covering 16 km at a depth of 110 m, the project validated the material's performance under operating conditions while demonstrating advantages in handling, corrosion resistance and installation efficiency compared with conventional steel pipelines.

The company also strengthened its position in telecommunications and gas infrastructure through microduct material solutions based on polyethylene high-density polyethylene (HDPE) formulations and participation in national plastic pipe standards development.

Collaboration with major Chinese gas companies to update gas pipe standards supported wider adoption in regulated infrastructure projects, reflecting the importance of technical standards and regulatory alignment in accelerating market acceptance.

Local manufacturing and supply-chain resilience featured prominently in SABIC's construction strategy.



A Lexan Thermoclick sheet

The launch of the KSB200 carbon black grade for colouring concrete blocks and kerbstones provided a locally produced alternative to imported iron oxide, while the introduction of polyethylene HDPE GF1737 for geomembrane applications targeted landfill, construction, chemical waste and agricultural sectors with a solution designed for high performance and processing efficiency.

SABIC commercialised PO Compound SABIC PI600A, an anti-abrasive polyolefin compound developed for mining slurry pipelines operating under extreme wear conditions.

The material delivers abrasion resistance, impact strength and durability intended to extend service life while reducing maintenance requirements and operational downtime.

The company also expanded its infrastructure portfolio with PE-RT II solutions for high-voltage cable applications, addressing growing demand for durable materials capable of supporting reliable power transmission and grid expansion.

ELECTRONICS, AUTOMOTIVE MARKETS RESHAPE DEVELOPMENT PRIORITIES

The electrical and electronics sector emerged as an important growth platform, supported by demand for flame-retardant materials, smart metering technologies and rapidly expanding data infrastructure.

SABIC reported strong performance from its flame-retardant thermoplastics portfolio, including halogen-free Lexan resins for audio speakers and customised solutions for power distribution units.

The rollout of smart metering systems generated additional demand for specialised materials.

SABIC responded by introducing

high-performance Lexan polycarbonate blends, a Cylolac resin grade meeting 650 deg C glow-wire requirements and its first polypropylene compound developed for a major electronics customer.

Sustainability considerations were incorporated through bio-based Lexan 124R RW resin and the company's first post-consumer recycled flame-retardant Lexan resin.

Artificial intelligence (AI)-related infrastructure created further opportunities.

For augmented reality glasses, SABIC developed Valox polyester solutions combining lightweight characteristics with mechanical strength to support ergonomic and durable designs.

Within data centres, the specialties business targeted thermal management, connectivity and miniaturisation challenges using Ultem, Siltem and Extem resin technologies.

These materials provide heat resistance, dimensional stability and compatibility with high-temperature manufacturing processes required for advanced electronics and high-speed data transfer systems.

Automotive developments reflected the sector's continuing transition towards electrification and advanced design requirements.

SABIC expanded its portfolio with new lighting materials, including Lexan HF3510LB resin-based light-bar solutions, PMMA grades for rear lamp lenses and translucent polypropylene materials for ambient lighting applications.

Collaboration with automotive and electric vehicle manufacturers also played a strategic role.

The company developed a low-bake painting solution allowing plastic bumpers and metal vehicle bodies to

be coated within a single process, improving manufacturing efficiency.

In China, joint projects with vehicle manufacturers led to new EV rear-panel solutions incorporating polycarbonate/polyurethane two-shot moulding technology and enhanced light diffusion characteristics, representing the first commercial deployment of PUR-RIM technology for exterior automotive components.

Electrification requirements also drove innovation in charging infrastructure.

SABIC introduced Noryl GTX LMX310 resin for large asymmetrical EV components such as charging flaps and developed the LNP ELCRES NPCXL9030L copolymer resin, certified under UL746G standards and designed to provide chemical resistance and durability in outdoor charging environments.

CIRCULARITY & TRANSITION BOOST LONG-TERM POSITIONING

Within healthcare, SABIC expanded production capabilities in Saudi Arabia to localise supply of medical-grade polypropylene, polyethylene and ABS materials.

Advanced materials for medical devices, tubing and connected healthcare applications complemented this localisation strategy.

The company's renewable energy portfolio addressed solar generation and energy storage requirements through specialised materials designed to improve durability and system performance.

New FORTIFY PV POE encapsulant grades based on Nexlene technology were introduced to mitigate potential induced degradation in solar modules, supporting reliability and reducing lifecycle costs.

HDPE ICP4507 was developed for floating photovoltaic installations, providing environmental stress crack resistance, impact resistance and durability suitable for nearshore and offshore applications.

Circularity initiatives continued through the TRUCIRCLE portfolio, which encompasses certified circular products, bio-renewable materials and mechanically recycled products supported by certification systems including ISCC+ chain-of-custody verification.

Partnerships spanning healthcare, packaging, mobility and consumer goods demonstrated efforts to integrate circular feedstocks and recycled content into commercial applications while maintaining performance requirements across diverse end markets. ■

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SABIC advances sustainability via circularity, decarbonisation

Carbon-neutrality roadmap, resource-efficiency programmes and workforce initiatives are aligned with evolving regulatory requirements, using sustainability as a driver of operational resilience, value creation and competitiveness

SUSTAINABILITY is increasingly shaping strategic decision-making across the petrochemical industry, and SABIC's initiatives illustrates how environmental, social and governance priorities are being integrated into business operations, risk management and long-term value creation.

From carbon reduction and renewable energy deployment to circular-economy solutions, workforce development and supply chain optimisation, the company is embedding sustainability considerations into both operational execution and corporate strategy, while aligning future ambitions with evolving regulatory frameworks.

The process is integrated with enterprise risk management, stakeholder engagement and executive-level oversight, ensuring that climate change, energy efficiency, circularity, resource efficiency, workforce management, supply chain performance, health and safety, and governance are directly linked to business strategy.

SABIC's sustainability performance over the past 15 years highlights both achievements and challenges.

Against a 2010 baseline, the company reduced greenhouse gas emissions intensity by 22.9 per cent, water-consumption intensity by 20.3 per cent and material-loss intensity by 55.5 per cent by the end of 2025.

Energy intensity fell by 12.8 per cent, below the company's 25 per cent target, reflecting feasibility constraints arising from market conditions and capital-cost considerations.

Meanwhile, absolute Scopes 1 and 2 emissions declined by 16.9 per cent from the 2018 baseline, moving the company closer to its interim target of a 20 per cent reduction by 2030.

DECARBONISATION PATHWAYS GUIDE LONG-TERM INVESTMENT

SABIC's decarbonisation roadmap reflects both technical feasibility and economic considerations.

Energy efficiency improvements rely largely on mature technologies and asset reliability enhancements, while renewable electricity procurement is linked to renewable energy certificates and national policy frameworks.

Long-term initiatives such as electrification and low carbon hydrogen require larger capital commitments, strategic partnerships and the ad-



SABIC's Technology Centre in Shanghai, China ... powered entirely by renewable electricity

vancement of emerging technologies.

During 2025, SABIC advanced several projects supporting these objectives, such as energy efficiency initiatives, which included completion of a major project at an MTBE production unit and implementation of a low temperature recovery system, both contributing to improved plant performance and lower emissions.

Renewable energy adoption also accelerated. In its Europe facilities, 65 per cent of electricity consumption was sourced from renewable energy, resulting in a cumulative 79 per cent reduction in electricity related indirect emissions compared with 2018.

The Shanghai Technology Centre achieved 100 per cent renewable electricity, while solar installations in Shanghai, Nansha and Chongqing expanded on site renewable generation capacity.

Carbon capture remains a significant component of the company's strategy, with its Jubail carbon capture facility capable of processing up to 500 kilotonnes of carbon dioxide annually from glycol production operations.

Captured carbon dioxide is converted into methanol and 2-ethylhexanol, with product carbon footprint accounting independently certified under the ISCC Carbon Footprint Certification scheme.

Total carbon dioxide utilisation, including carbon captured from ammonia production and converted into urea, reached 3.9 million tonnes

during 2025.

Electrification initiatives also progressed through the SABIC-BASF-Linde steam cracker electrification project.

Extended testing continued on what is described as the world's first large scale demonstration plant for an electrically heated steam-cracking furnace.

The technology has the potential to reduce direct emissions from one of the industry's most energy intensive processes by approximately 90 per cent.

CREATING VALUE THROUGH CIRCULARITY & RESOURCE EFFICIENCY

Circular economy initiatives are centred on sustainable product design, lifecycle assessments, carbon footprint management and business model innovation.

The company continues expanding the use of recycled and bio renewable feedstocks while pursuing waste reduction across its value chain.

A key enabler is SABIC's product carbon footprint automation platform, which calculates carbon footprints across the company's product portfolio using primary manufacturing data.

Certified to ISO 14067:2018 and Together for Sustainability (TfS) guidelines, the system supports customer disclosure requirements, product certification programmes and regulatory reporting, including alignment with European Union Carbon Border Adjustment Mechanism requirements.

Resource efficiency remains another strategic priority. Water stewardship efforts rely on monitoring systems, wastewater inventories, periodic optimisation assessments and exploration of recycling opportunities with regional utility companies.

Material loss reductions have been driven primarily by lower flaring volumes and increased carbon dioxide utilisation, alongside process optimisation measures and upgraded fuel gas systems.

Flaring emissions have declined by 57 per cent from the 2010 baseline, approaching the company's 65 per cent target.

Biodiversity has also emerged as a material business topic.

During 2025, SABIC launched a biodiversity assessment programme covering company-level, sector-focused and site-specific evaluations across selected facilities in Europe and Saudi Arabia to identify nature related risks and opportunities and support future performance measurement.

WORKFORCE, SUPPLY-CHAIN RESILIENCE AND SAFETY UNDERPIN PERFORMANCE

SABIC's sustainability strategy extends beyond environmental performance into workforce management, responsible sourcing and occupational safety.

Workforce development initiatives include leadership programmes, scholarship schemes, AI-enabled learning platforms, global assignments and mentoring programmes.

Average training reached 67 hours per employee during 2025, while employee survey participation rose to a record 81 per cent.

Supply chain management is positioned as both a business performance and sustainability lever.

SABIC supplies customers in more than 60 countries through over 142 distribution locations and delivers more than 36 million metric tonnes of products annually.

During 2025, network optimisation improved lead times, reduced reliance on long haul feedstocks and strengthened logistics resilience amid geopolitical disruption.

Health and safety performance showed measurable improvement. The total recordable injury and illness rate fell 22 per cent year on year to 0.07 per 200,000 hours worked, while the Tier 1 process-safety-events rate improved by 30 per cent to 0.005. ■

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From data to decisions: The co-engineered reliability model that supports Vision 2030

Megger's industrial reliability service is positioned to help Saudi Arabia's industrial operators convert condition-monitoring data into validated, actionable decisions through a co-engineered reliability approach



For plant managers, MIR's architecture is deliberately designed as a standalone platform

VISION 2030 places industrial diversification and operational excellence at the heart of Saudi Arabia's economic future.

For high-capacity operators such as SABIC, one of the world's largest diversified chemical companies and a key Vision 2030 enabler, performance reliability, safety and operational efficiency are not abstract priorities.

They translate every day into the availability of the rotating equipment, electrical infrastructure and supporting systems on which the wider business depends.

That challenge is increasingly urgent across the Kingdom. As Saudi Arabia accelerates industrial diversification under Vision 2030, operators are raising the bar for asset uptime, lowering their tolerance for surprise outages and seeking ways to extract greater confidence from the data their monitoring systems already produce — all against a tightening talent backdrop.

Saudi Arabia is projected to face a

skilled-worker shortage of 663,000 by 2030, according to Korn Ferry, with unrealised revenue running into hundreds of billions of dollars.

The reliability question is no longer whether condition data exists, but whether organisations can turn it into decisions quickly enough to matter, sufficiently validated to act on and without being held back by a shortage of the specialist engineering expertise required to interpret it.

THE RELIABILITY GAP

Conventional approaches to rotating-asset monitoring rely heavily on vibration analysis, and rightly so: Vibration data is one of the most dependable early warning signals for mechanical faults such as imbalance, misalignment and bearing degradation.

But it's only part of the picture, and a significant share of motor failures originates on the electrical side, including insulation degradation, stator faults, supply quality issues.

Such issues do not always an-

nounce themselves in a vibration signature until well advanced.

Two further problems persist even where the data points are comprehensive.

The first is signal-to-noise: modern platforms can flood maintenance teams with alerts, many of them false positives, leaving genuine issues hidden under routine notifications.

The second is interpretation, as sensor data becomes useful only when someone with the right experience can translate it into a confident maintenance decision.

A CO-ENGINEERED MODEL

Megger Industrial Reliability (MIR) is built around a deliberately different proposition.

Rather than supplying instruments and software for customers to operate themselves, MIR delivers reliability as a complete service: Wired and wireless vibration sensors developed in-house, the OPUS AI analytics platform and a team of specialist

reliability engineers who function as an extension of the operator's team.

This Co-Engineer™ approach has a guiding principle: To deliver answers, not data.

The technical foundation begins on the asset. Sensors on critical rotating equipment including motors, pumps, fans, compressors and gearboxes capture continuous vibration signatures, identifying the early indicators of imbalance, misalignment and bearing wear that precede most mechanical failures.

The OPUS platform then ingests, classifies and analyses that data, suppressing false alarms and surfacing the signals that genuinely warrant attention.

Where other platforms can leave engineers to interpret outputs largely on their own, MIR's reliability specialists pick up where the AI leaves off, validating critical findings, contextualising them against asset history and recommending specific actions for the maintenance team.

The result is a service that functions regardless of the size of the operator's in-house reliability team.

For those with established expertise, MIR augments and accelerates existing work.

For operators with a more pronounced skills gap, MIR effectively delivers a capability that would take years to build internally.

In both cases, the promise is the same: validated diagnostic insight, continuously available, supported by 25 years of condition-monitoring expertise.

CO-E™: ENGINEERING JUDGEMENT AT MACHINE SPEED

Central to the OPUS proposition is Co-E™, the AI engine that powers the service's always-on diagnostic depth.

It does not simply detect anomalies and forward them as alerts; it classifies and contextualises them, then recommends a course of action, work that would otherwise consume hours of engineering time per incident.

For reliability and maintenance teams, the practical effect is twofold. Routine pattern analysis is handled at machine speed and scale, freeing specialists to focus on the high-value interventions that benefit most from human judgement.

The same diagnostic capability is also available to analysts and non-experts, with recommendations expressed in actionable terms.

Co-E does not replace the reliability engineer, it scales them. In a regional market where experienced special-



Industrial asset monitoring ... MIR delivers reliability as a complete service

ists are in short supply, that's a serious competitive advantage.

THE ELECTRICAL DIMENSION

Vibration monitoring is only part of the MIR diagnostic toolkit. The service draws on Megger's heritage in electrical testing, including the Baker Instruments lineage, along with partial discharge measurement capability.

Combining mechanical and electrical methods gives rotating machines a fuller picture of asset health

than vibration-only services can offer electrical faults, which account for a considerable share of motor failures, become visible alongside mechanical faults.

The result is fewer blind spots and earlier intervention on issues that would otherwise surface only at the point of failure

BUILT TO DEPLOY

For plant managers wary of integration projects that overrun, MIR's

architecture is deliberately self-contained.

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Following an onsite assessment, deployment is wired or wireless to suit the site, retrofit-friendly on existing assets, and accountable through a single relationship rather than a chain of vendors.

For operations and digital transformation leaders, that single-point accountability simplifies procurement and reduces multi-vendor implementation risk.

A MEASURABLE SHIFT

The aggregate effect is a measurable shift in how reliability is managed: From reactive intervention to planned action, raw data to validated decisions, skills-gap bottleneck to scalable diagnostic capability.

For SABIC and the wider population of high-capacity operators across the Kingdom, those outcomes align with Vision 2030's emphasis on operational excellence and long-term industrial competitiveness: Less unplanned downtime, longer asset life, safer working environments.

For operators ready to move beyond data-rich, decision-poor monitoring, Megger Industrial Reliability offers a co-engineered alternative designed to deliver the validated insight, scalable expertise and operational visibility the Kingdom's industrial ambitions increasingly demand. ■

MIR combines mechanical and electrical methods to give rotating a fuller picture of asset health



GCC plastics circularity: Balancing competitiveness, global alignment

Regional benchmarking, data interoperability, and managing market expectations can help the GCC industry transition toward more circular plastics systems, writes Noora Mukhtar, Senior Research Specialist, GPCA

ACROSS the Gulf Cooperation Council (GCC), circular-economy considerations are increasingly shaping industrial planning and investment decisions.

At the same time, the region's role as a major exporter of polymers, accounting for 4 per cent of global polymer export value in 2024, places it at the intersection of global sustainability expectations and competitive manufacturing dynamics.

As international markets place greater emphasis on product recyclability, traceability, and lifecycle performance, GCC producers face the challenge of adapting operational and data systems to meet increasingly differentiated market requirements, while continuing to leverage their established cost competitiveness.

There are key business risks emerging from evolving global plastics frameworks and highlights areas where regional best practices can enhance resilience and market readiness without constraining growth.

STRENGTHENING MARKET READINESS

Requirements linked to product design, documentation, and traceability increasingly shape market access conditions for plastic exporters.

While producer responsibility systems differ across jurisdictions, exporters are indirectly affected through buyer expectations related to recycled content verification, mass-balance accounting, and design-for-recycling documentation.

For GCC producers, interoperability between national certification schemes and widely recognised international standards is increasingly becoming commercially relevant.

Two indicators illustrate this expo-



18 per cent of GCC plastics are exported to markets with established recyclability and traceability frameworks

sure (Figure 1):

- **Core exposure:** Approximately 18 per cent of GCC plastics exports are destined for markets with established recyclability and traceability frameworks.

- **Emerging exposure:** Nearly 80 per cent of exports go to markets with emerging requirements by 2030.

Consequently, some export markets increasingly require recyclability documentation and traceability certificates, which could affect a very large share of exports by 2030, based on current market trajectories.

FINANCING CIRCULAR SYSTEMS SUSTAINABLY

Across many global markets, col-



Noora Mukhtar

lection and recycling systems are commonly coordinated through producer responsibility organisations, funded via eco-modulated contributions or deposit-return mechanisms.

These arrangements provide dedicated funding for collection and recycling activities and generate data on material flows that can support more effective circular systems.

For exporters, the key consideration is often less the specific structure of these systems and more the transparency and predictability of associated cost signals across markets.

End-of-life system costs vary by product type. Packaging formats such as PET beverage bottles, which benefit from established collection systems and strong secondary markets, typically face lower system costs.

PE flexible films tend to incur higher costs due to more complex sorting and lower recycling yields, while PP rigid containers generally fall between these two extremes.

These costs are distributed across the value chain. Material producers may face costs related to design adaptation and certification; converters and brand owners manage compliance and reporting; and consumers may experience indirect pricing or participation signals.

As a result, the economic impact of end-of-life management is shared across stakeholders, highlighting the importance of coordination, data transparency, and product design choices in maintaining competitiveness across global plastics markets.

At the regional level, benchmarking tools that map export exposure against evolving recyclability, documentation, and traceability requirements can help companies anticipate where additional data, certification, or product adaptation may be required (Figure 2).

Such tools support strategic planning by translating diverse market requirements into comparable reference points.

ASSESSING THE POTENTIAL OF ADVANCED RECYCLING

Mechanical recycling remains the primary route for plastics recovery but faces limitations for mixed, multi-layer-

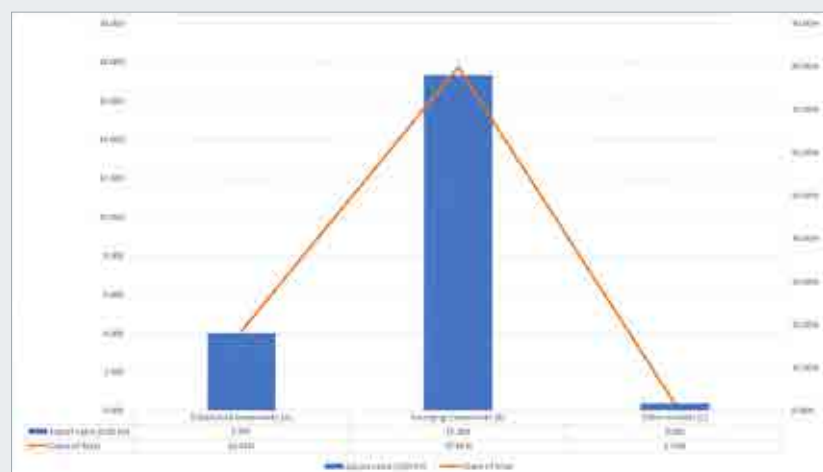


Figure 1 ... the share of GCC plastics exports potentially subject to recyclability or traceability requirements by 2030



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er, or contaminated streams.

As a result, emerging best practices increasingly recognise advanced or chemical recycling as a complementary pathway where mechanical options are constrained or no longer viable.

In practice, the role of advanced recycling is increasingly assessed against defined performance criteria rather than technology labels alone.

These include demonstrated environmental performance on a lifecycle basis, traceability of feedstocks and outputs, controlled management of residues and by-products, and integration with existing waste-management systems.

Within the GCC, chemical recycling initiatives are still at an early stage, with pilot projects and announced initiatives being explored in parallel with established mechanical recycling systems (Table 1).

From a business perspective, this creates a transitional phase in which access to certain applications or markets may increasingly depend on the availability of credible recovery pathways for complex waste streams.

Therefore, companies face strategic choices around how and when to engage with complementary recycling technologies, while ensuring that any claims are supported by robust data and verifiable performance.

MANAGING EXPOSURE IN SHORT-LIFECYCLE APPLICATIONS

Single-use and packaging applications account for a meaningful share of GCC polymer exports, primarily through the upstream supply of primary resins rather than finished products.

Changes affecting these segments do not translate mechanically into equivalent revenue losses. Instead,

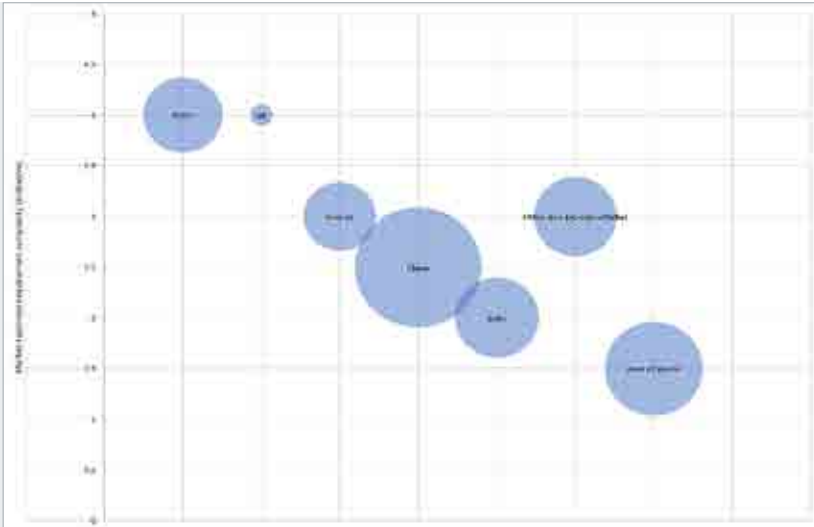


Figure 2 ... Illustrative market readiness benchmark for GCC polymer exports (2024)

exposure may arise through shifts in demand composition, evolving product specifications, and pricing dynamics, particularly for upstream suppliers.

Mapping value streams helps identify which applications –such as films, bags, or beverage containers– are more sensitive to changes in downstream requirements.

Diversifying toward more durable applications, including construction materials, automotive components, and reusable packaging solutions, provides a natural hedge against volatility and aligns with industrial strategies focused on downstream value creation.

INTENSITY-BASED PERFORMANCE TARGETS

In global sustainability discussions, some analyses explore aggregate production limits as a potential pathway to reducing waste and emissions.

In parallel, a growing body of analysis highlights that intensity-based approaches –such as reducing emissions per ton of product, improving resource efficiency, or increasing recycled content– can deliver significant environ-

mental gains per unit of investment.

Such approaches allow efficiency improvements to translate into measurable progress while maintaining flexibility for producers that demonstrate strong performance.

By benchmarking regional performance indicators, the GCC industry can demonstrate progress through transparent efficiency improvements rather than absolute output constraints, supporting balanced outcomes for both sustainability and economic competitiveness.

BUILDING ENABLING INFRASTRUCTURE & DATA SYSTEMS

Recycling performance ultimately depends on collection coverage, effective segregation, and reliable market outlets for recovered materials.

The Organisation for Economic Co-operation and Development (OECD) scenario modelling indicates that coordinated improvements in waste collection, sorting, and engineered disposal infrastructure could reduce plastic leakage to the environment by around 50 per cent compared with baseline pathways.

Across the GCC, high urbanisation levels have supported the development of municipal collection systems in major cities.

However, collection coverage, segregation practices, and data consistency remain uneven across jurisdictions, limiting the ability to scale recycling outcomes and capture regional efficiencies.

Beyond physical infrastructure, greater alignment of product data, material transparency, and information sharing across value chains can strengthen plastics circularity outcomes while supporting broader product stewardship objectives.

Initiatives such as harmonised waste classification codes, mutual recognition of certification schemes, and interoperable traceability frameworks can improve the flow of secondary materials across borders while safeguarding environmental integrity.

CONCLUSION

Global circularity developments do not present a single, uniform challenge for GCC polymer producers.

Instead, they translate into a set of interconnected business risks and strategic considerations shaped by market expectations, data requirements, and evolving end-of-life performance considerations across destination markets.

The GCC’s trajectory emphasises investment-led transformation, focusing on innovation, technology deployment, and voluntary alignment with global standards.

This distinction positions the region as a strategic integrator, able to blend its feedstock advantage and industrial expertise with emerging circular solutions markets.

Ultimately, competitiveness in a more circular global economy depends less on absolute production volumes and more on the ability to demonstrate efficiency, transparency, and adaptability across value chains.

By strengthening regional benchmarking, improving data interoperability, and aligning product and material information with evolving market expectations, the GCC industry can enhance resilience while preserving growth potential, positioning itself as a pragmatic and globally connected participant in the transition toward more circular plastics systems.

* The Gulf Petrochemicals and Chemicals Association (GPCA) represents the downstream hydrocarbon industry in the Arabian Gulf, and voices the common interests of more than 250 member companies from the chemical and allied industries, accounting for over 95 per cent of chemical output in the Arabian Gulf region. The industry makes up the second largest manufacturing sector in the region, producing over \$108 billion worth of products a year. ■

Country	Recycling type	Project/initiative example	Entities/partners	Status
Saudi Arabia	Mechanical	National plastics recycling initiatives under SIRC ecosystem	SIRC and private operators	Operating / expanding
	Chemical	Advanced recycling pilot converting plastic waste to circular feedstock	SABIC / Aramco / TotalEnergies	Pilot completed
	Chemical	Chemical recycling facility for mixed plastics (pyrolysis oil)	SABIC / SIRC	Feasibility study announced
United Arab Emirates	Mechanical	Food-grade rPET recycling plant (Abu Dhabi)	Repeet / BEEAH / Agthia	Announced / planning
	Mechanical	Plastics recycling facilities within BEEAH integrated waste systems (Sharjah)	BEEAH Group	Operating
	Chemical	Plastics-to-Liquids (PtL) chemical recycling facility (Dubai)	DUBAL Holding/ Quantafuel/ BASF	Feed-stage announced
Oman	Mechanical	PET recycling and processing plant	Next Generation Recycling Solutions; Green Muscat	Announced / under development
Qatar	Mechanical	Industrial and municipal recycling initiatives including plastics (e.g. Al Haya Plastic Waste Recycling Factory)	Al Haya Waste Management; other private operators	Operating / pipeline
Bahrain	Mechanical	Plastics recycling operations (e.g. Al Majid Recycling Factory)	Almajid Plastic & Metal Recycling Factory (APF)	Operating
Kuwait	Mechanical	Existing plastics recycling factories with expansion plans (e.g. Beatouna, Crown, MRC)	Private recycling operators	Operating / planned expansion

Source: GPCA research, 2025

Table 1 ... snapshot of announced and pilot mechanical and chemical recycling initiatives across the GCC

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The global chemical sector struggles to decarbonise



Chemical sector struggles to align climate ambitions with real transition delivery

A comparative assessment reveals uneven decarbonisation progress, weak Scope 3 strategies, limited capital transparency and governance barriers challenging chemical industry efforts to achieve credible net zero pathways

BY ABDULAZIZ KHATTAK

THE global chemical sector faces an acute strategic inflection point as the industry attempts to align its operations, capital deployment, and governance structures with the demands of a net-zero economy.

Companies responsible for materials underpinning every major value chain are increasingly under scrutiny for the credibility of their transition plans, yet wide disparities remain between stated ambition and measurable progress.

A report by Planet Tracker provides a comparative evaluation of eight major chemical producers and highlights systemic challenges that continue

to impede sector-wide alignment.

The assessment offers a cross-company analysis of climate strategies, risk exposure, governance frameworks, and capital allocation patterns, enabling a detailed examination of which firms are advancing transition plans and which are failing to keep pace with emerging expectations.

REGIONAL LANDSCAPE & CLIMATE ALIGNMENT

The analysis groups the eight companies into three climate-alignment tiers based on the credibility of their 2030 targets, delivery record, and disclosure quality.

Dyno Nobel stands alone as the only producer assessed as 1.5 deg C-aligned, while LyondellBasell is

the strongest performer among the firms clustered around the 2 deg C and below-2 deg C categories.

At the opposite end, Dow and a major Middle East chemicals producers remain on 3 deg C trajectories shaped by limited ambition, absent Scope 3 targets.

Dyno Nobel's position as the sole 1.5 deg C-aligned producer reflects its 39 per cent reduction in operational emissions versus a restated 2020 baseline, surpassing its 2030 targets years ahead of schedule.

Key abatement gains stem from the Moranbah and LOMO nitrous oxide abatement projects, which together delivered around 750 kilotonnes of CO₂-equivalent annual reductions.





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The company's governance structure reinforces its progress, integrating climate KPIs into both short-term and long-term incentive frameworks, each weighted at 10 per cent.

LyondellBasell has set the sector's most ambitious combined target, committing to a 42 per cent absolute reduction in Scopes 1 and 2 emissions and 30 per cent in Scope 3 by 2030.

However, the credibility of this pathway is challenged by an 8 per cent rise in its total emissions between 2020 and 2024, driven primarily by Scope 3 growth linked to rising production volumes.

Achieving its 2030 targets will require a 46 per cent emissions cut from 2024 levels.

Despite these execution pressures, the company has committed \$1 billion to transition projects since 2023, secured 1,820 MW of renewable power capacity through PPAs, and advanced its MoReTec-1 chemical recycling project, though the link between these investments and quantifiable emissions abatement remains undeclared.

The four companies falling within the 2 deg C cluster, including Air Liquide, BASF, Bayer, and Toray, demonstrate operational progress but face structural constraints, particularly around Scope 3 emissions and investment-to-outcome transparency.

Air Liquide reduced Scopes 1 and 2 emissions by 11 per cent since 2020 and directed over 40 per cent of its EUR16 billion (\$18.63 billion) in industrial investments for 2022-2025 to energy transition initiatives.

It has also earmarked \$9.3 billion for low-carbon hydrogen by 2035 and issued three \$582 million green bonds.

Nevertheless, upstream Scope 3 emissions surged by 67 per cent over the same period, limiting total emissions reduction to just 3 per cent, and the company still lacks a quantified Scope 3 target.

BASF has achieved 72 per cent of its 2030 Scopes 1 and 2 target, cutting operating emissions by 17 per cent since 2020.

However, much of this progress reflects an 11 per cent decline in sales volumes rather than active decarbonisation.

Its annual transition capex of roughly \$262 million remains substantially below what would be needed for an aligned transition.

Its Scope 3 target, a 15 per cent intensity reduction limited to upstream materials, covers only 52 per cent of its total Scope 3 footprint, and the company acknowledges that volume growth could offset any intensity gains.

Bayer has reduced total emissions by 9 per cent since 2020 despite annual revenue rising 3 per cent.

Its 42 per cent Scopes 1 and 2 reduction target by 2029 is among the more ambitious within the peer group.

However, its exclusion of Category 11 emissions (use of sold products) from Scope 3 disclosures significantly understates its total footprint, particularly given the carbon intensity associated with its agricultural inputs.

Its \$582-million decarbonisation commitment through 2029 represents only 1.5 per cent of annual capex, and none of this spending is aligned with the EU Taxonomy.

Toray's progress is dominated by intensity-based reporting rather than absolute reductions.

Its 43 per cent reduction in emissions intensity since FY2013 largely reflects revenue growth and yen depreciation effects, with only around one-quarter attributable to genuine abatement.



The assessment offers a cross-company analysis of climate strategies, risk exposure, governance frameworks, enabling a detailed examination of which firms are advancing transition plans

Absolute Scopes 1 and 2 emissions fell by approximately 10 per cent over FY2013-FY2024, and its FY2030 intensity target could be met even if absolute emissions rise.

Toray has not set absolute Scope 3 targets, and sustainability metrics are not embedded in executive remuneration.

At the lower end of the spectrum, Dow illustrates the structural challenges constraining parts of the sector.

Dow has achieved its 2030 Scopes 1 and 2 target, a 15 per cent reduction, but its target is modest compared to peers' commitments of 25 per cent to 42 per cent.

The company has rejected SBTi validation on the grounds that guidance "does not accurately and scientifically reflect the realities of the chemical sector".

Delay to its Path2Zero project, which would have decarbonised 20 per cent of its ethylene capacity, adds further execution risk.

Its Scope 3 emissions, which represent 73 per cent of its total footprint, remain untargeted.

PROJECT ACTIVITY & SCOPE 3 STRATEGY

Scope 3 emissions remain the sector's most significant challenge, representing between 70 per cent and 84 per cent of total emissions for seven of the eight companies assessed.

Air Liquide is the only exception, with Scope 3 accounting for 40 per cent of its footprint.

The range of ambition across Scope 3 strategies is wide. LyondellBasell leads with a 30 per cent absolute Scope 3 reduction target, though its upstream Scope 3 emissions have risen 13 per cent since 2020.

Dyno Nobel has introduced business-unit Scope 3 targets following corporate restructuring, signalling the sector's first attempt to cascade value-chain targets into operational decision-making.

BASF's intensity-only target creates structural loopholes where absolute emissions could rise with increasing production, while Dow, SABIC, and Toray remain without quantified Scope 3 commitments.

Across all eight companies, a universal disclosure gap persists: none publishes quantified emissions reductions attributable to supplier or customer engagement programmes.

While supplier coverage is often reported (Dow

assesses 3,727 suppliers, BASF 1,900, and Lyondell-Basell 840) the tonnes of CO₂-equivalent expected to be reduced through supplier engagement remain undisclosed, limiting verification of influence across value chains.

DECISION DRIVERS: GOVERNANCE, INCENTIVES, CAPITAL & RISK

Governance and incentives are central to transition credibility, yet the report finds that climate-linked executive remuneration remains immaterial across most companies.

Dyno Nobel is the only firm to embed climate KPIs into both STI and LTI schemes at a balanced 10 per cent weighting each.

In contrast, incentive structures at Dow (200 per cent total cap) and Bayer (250 per cent cap) can allow financial outperformance to overwhelm climate metrics.

Risk exposure varies, with regulatory and physical risk disclosures highly inconsistent.

Dow estimates its EU ETS exposure at \$112-168 million annually by 2030, potentially rising above \$200 million, while LyondellBasell estimates up to \$162 million.

Physical-risk disclosure is most developed at Air Liquide, which has screened 670 assets across 10 peril types under two IPCC scenarios, and at Dow, which has identified \$315 million to \$1.3 billion in potential drought-related impacts at its Freeport, Texas site.

Policy-alignment challenges remain significant. Several companies maintain memberships in trade associations with lobbying positions inconsistent with their public support for the Paris Agreement.

Dow retains seven memberships rated "Misaligned" or worse by InfluenceMap, while Lyondell-Basell retains memberships in associations that have actively lobbied against EU and US climate initiatives.

Bayer presents detailed association-alignment reporting but simultaneously endorsed the Antwerp Declaration, which criticised prescriptive environmental regulation, creating tension with its climate messaging.

Toray demonstrates general support for energy transition through Japanese industry groups, but with no evidence of advocacy for stronger regulation.

FORWARD-LOOKING IMPLICATIONS FOR THE SECTOR

The report highlights five cross-cutting themes shaping investor engagement. Scope 3 remains the primary litmus test for aligning climate ambition with real-world emissions outcomes.

Intensity-based metrics risk concealing stagnation, particularly where revenue or production growth can mask rising absolute emissions.

Capital-to-carbon traceability remains absent, leaving investors unable to evaluate whether transition spending is sufficient or efficient.

Incentive-design gaps undermine accountability, and regression in transparency signals elevated transition risk.

Across the sector, the transition is underway but insufficient in pace and depth.

Only one company aligns with a 1.5 deg C pathway, and even the strongest performers face structural barriers in Scope 3 strategy, capital deployment, and governance alignment.

Meanwhile, the bulk of the sector remains constrained by under-developed value-chain strategies, inconsistent risk disclosure, and capital allocation patterns that lack demonstrable abatement impact. ■



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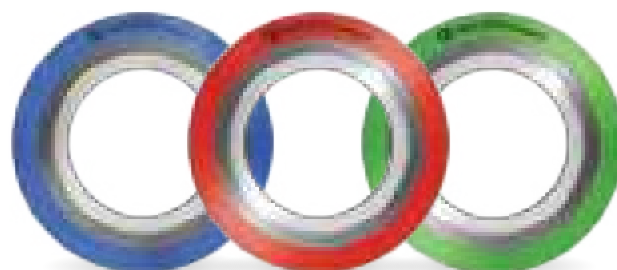
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AI solution boosts refinery yields, efficiencies

EMERSON, a global automation leader, has announced the successful deployment of an AI-driven refinery optimisation solution for Aramco, one of the world's leading integrated energy and chemicals companies.

The collaboration commenced with the integration of Emerson's Aspen Hybrid Models™ into Aramco's existing refinery planning framework, resulting in the creation of one of the world's largest multi-site, multi-period optimisation models.

By combining first-principles models, deep domain expertise, and purpose-built industrial AI, Aspen Hybrid Models™ capture nonlinear relationships in yield and quality responses, significantly enhancing the accuracy of refinery planning models.

The deployment has already achieved yield and quality prediction accuracy of up to 98.5 per cent in key refinery units.

These hybrid AI models have been implemented in continuous catalyst regeneration (CCR) and platformer units, where they are enabling more precise feedstock blending, minimising gaps between planning and execution, and improving the accuracy of margin forecasting across Aramco's



Aramco plans to expand the hybrid modelling approach to hydrocracker units across assets

global refining network.

Current efforts are focused on expanding the hybrid modelling approach to hydrocracker units across Aramco's assets.

This expansion is expected to further enhance model accuracy and demonstrate the scalability and robustness of this AI-driven optimisation strategy across the enterprise.

"This deployment represents a significant mile-

stone in Aramco's AI strategy and our long-standing relationship with Emerson," says Ahmad Alkudmani, director of the global optimiser department at Aramco.

"We are committed to leveraging innovative technologies for smarter, more efficient refining optimisation. With improved model accuracy, we are enhancing planning decisions, reducing the manual adjustments required from our engineers, and uncovering new value across our global assets."

Aramco is using Aspen Hybrid Models built and deployed in Emerson's AspenTech performance engineering and manufacturing and supply chain product suites.

As a result, Aramco was able to create highly accurate nonlinear optimisations using thousands of converged simulation cases built upon rigorous first-principles models calibrated with actual plant data.

The approach provides Aramco with a scalable, robust tool for global refinery planning.

"Aramco continues to set the standard for operational excellence through digital innovation," says Claudio Fayad, chief technology officer of Emerson's Aspen Technology business. ■

Clariant's new nextgen catalyst reduces tar precursors, fouling

CLARIANT'S CATOFIN 1000 next-generation propane dehydrogenation catalyst builds on the success of the commercially proven CATOFIN 310 Series.

The new catalyst delivers improvement in both selectivity and productivity, extended lifetime, and up to 20 per cent lower tar precursors, resulting in significantly reduced fouling.

This combination of performance enhancements provides an exceptional value proposition for customers seeking to maximise operational efficiency and returns.

Together with Clariant's digital service portal CLARITY, customers can further improve catalyst-related plant performance with 24/7 access to their real-time catalyst performance data, advanced visualisation, analysis, and monitoring tools.

The service is offered across all Clariant catalyst applications, and has helped optimise plant performance parameters regarding efficiency, sustainability,



CATOFIN 1000 ... maximising operational efficiency through next-generation propane dehydrogenation technology

and safety.

Jace Wang, Vice-President and Head of Propylene at Business Unit Catalysts comments: "With the introduction of CATOFIN 1000, we continue to push the boundaries of catalyst innovation. This latest advancement demonstrates our unwavering commitment to delivering cutting-edge solutions that drive superior performance for our customers in the propylene industry. The significant reduction in tar precursors and fouling, combined with enhanced selectivity and productivity, represents a major step forward in PDH technology."

The CATOFIN process combines Clariant's tailor-made catalysts and

Heat Generating Material (HGM) with Lummus's advanced process and is among the fastest growing technologies for producing propylene.

The new CATOFIN 1000 catalyst represents the latest evolution in this proven technology platform, offering PDH operators enhanced performance that translates directly to improved plant economics and operational reliability.

The up to 20 per cent reduction in tar precursors is particularly significant, as it minimises fouling-related downtime and maintenance requirements, allowing plants to operate more efficiently over extended periods. ■

Real-time AI empowers operators to make data-driven decisions

KETJEN, a provider of advanced catalyst solutions and technical expertise for the refining industry, has partnered with Imubit, an industrial AI software company, to give refiners real-time, actionable catalyst intelligence for fluid catalytic cracking (FCC) and hydroprocessing (HPC) units.

The partnership combines Ketjen's catalyst expertise including proprietary models, laboratory data and technical analysis with Imubit's closed-loop, real-time digital platform.

Through Ketjen's iKet Connect portal, part of the company's expanded digital services portfolio, the companies will provide refinery teams with process and catalyst data, along with near-real-time, expert-driven insights and analytics.

The collaboration is intended to help refiners make informed decisions based on guidance tailored to current operating conditions.

"Ketjen has un-



Imubit's platform uses AI to monitor process behaviour, detect deviations and quantify their impact

matched expertise in catalyst performance, strategy and optimisation," says Henri Tausch, Ketjen's Chief Commercial Officer.

"Through our partnership with Imubit, we are connecting that expertise to refiners' live unit data so customers can make timely, informed decisions that improve stability, performance and profitability."

Imubit's platform provides secure, continuous connectivity to refinery systems and uses AI to monitor process behaviour, detect deviations and quantify their impact.

Ketjen's technical teams integrate advisory models and domain knowledge into

the platform to guide operating adjustments, catalyst strategy and unit optimisation.

"Imubit's platform is designed to continuously learn how complex refining units operate from live data," says Gil Cohen, Imubit's CEO.

"Paired with Ketjen's catalyst expertise, refiners gain earlier visibility into performance changes and clearer guidance on how to respond."

Pilot deployments are underway with refinery customers in North America and Europe, with plans to expand to additional sites and regions in 2026. ■