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# LNG2026

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# Six key takeaways from LNG2026



Renewed Confidence in LNG



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Digital Transformation in LNG Goes Beyond the Buzz



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# LNG2026 Highlights

From inspiration to conversation, the four days at LNG2026 had it all. Review the energy, connections and moments that made the week memorable. •



# LNG2026 Show Dailies

Catch up with the news and stories around LNG 2026. Official Media Partner, *Petroleum Economist* published four daily issues which can still be downloaded from [Ing2026.com/show-daily-page](http://Ing2026.com/show-daily-page).

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## Six Key Takeaways from LNG2026

A renewed conviction in LNG, led by Qatar, the importance of economics over politics, the power of partnerships, revised expectations around demand and the role of LNG in energy security were some of the important lessons learned in Doha | **Paul Hickin**, Editor-in-Chief and Chief Economist, *Petroleum Economist*

At LNG2026 in Doha, His Excellency Saad Sherida Al-Kaabi, Minister of State for Energy Affairs, President and CEO of QatarEnergy, said: “we continue to believe in gas as the energy of the future and that increasing demand will continue to be driven by global economic growth and other factors like artificial intelligence and datacentres.”

H.E. Minister Al-Kaabi emphasised Qatar’s strategic role in meeting global energy demand. “People need to be prosperous, including about a billion people don’t have the basic electricity that we enjoy. We can’t deprive them from that growth,” he said.

QatarEnergy has ambitious production targets as it leads the LNG growth story.

“Our projects over the next decade will account for ap-

proximately 40% of new global LNG supplies,” H.E. Minister Al-Kaabi said, highlighting Qatar’s expanding influence.

Qatar is evidence of a long-term confident vision and coherent strategy that LNG will play a crucial evolving role in meeting the world’s need for affordable, reliable and lower-carbon energy shared by many top industry participants from ExxonMobil to Woodside.

### **Economics trumps politics**

Renewable energy hype and hyperbole has driven unworkable regulations, created policy inconsistency, increased costs, hampered investment, undermined energy security and been counterproductive in terms of lowering carbon ambitions.

H.E. Minister Al-Kaabi also pushed back against earlier calls to phase out hydrocarbons, saying recent years have exposed a gap between policy rhetoric and physical energy realities.

“A few years ago, some organisations were talking about a ‘cancel culture’ for oil and saying demand would disappear by 2030,” he said. “Those voices have disappeared. You need oil, you need gas and you need electricity for a very long time.”

QatarEnergy remains focused on lowering emissions through carbon capture, efficiency gains and technology, but he noted that energy security, affordability and decarbonisation must advance together.

## A few years ago, some organisations were talking about a ‘cancel culture’ for oil and saying demand would disappear by 2030. Those voices have disappeared – H.E. Minister and QatarEnergy CEO Al-Kaabi

### Power of partnerships

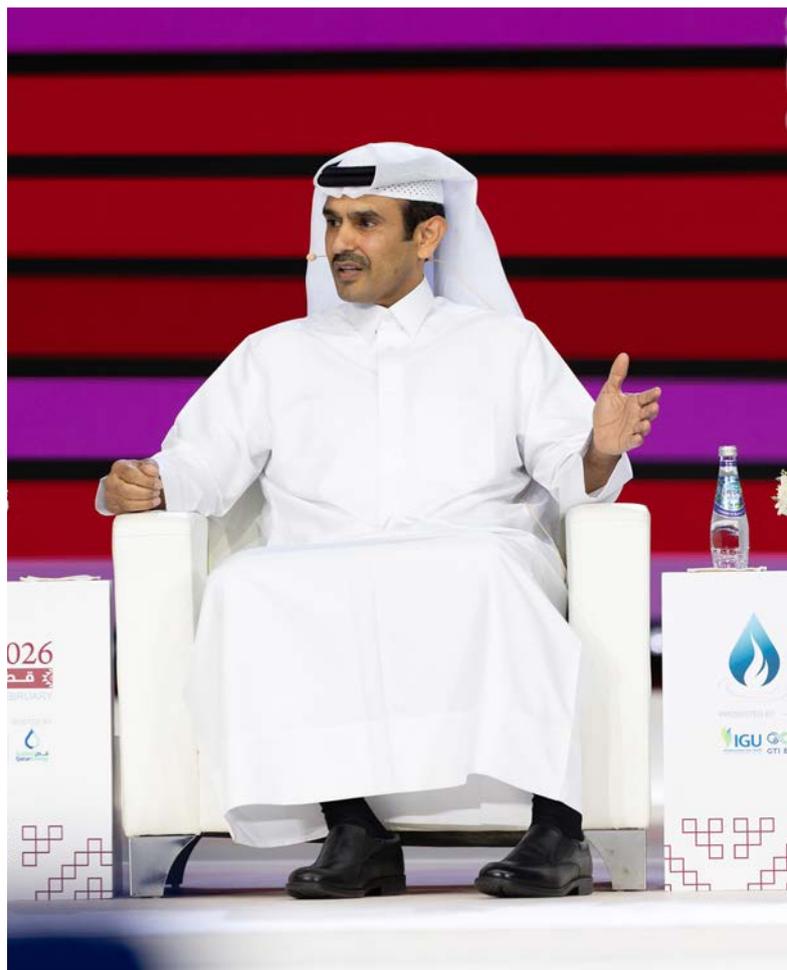
QatarEnergy signed groundbreaking deals both with long-standing partners and with new ones, highlighting that relationships and trust underpin commercial realities.

QatarEnergy and Japan’s JERA forged one of the most significant long-term LNG supply agreements in recent years, a deal that highlights both Qatar’s ambition to remain the world’s leading LNG exporter and Japan’s determination to secure stable energy supplies for decades to come. The agreement commits QatarEnergy to deliver 3mt/yr of LNG to JERA over 27 years. This contract is remarkable not only for its sheer length but also for the strategic implications it carries for both nations and the global LNG market.

Meanwhile, QatarEnergy and Petronas signed a landmark 20-year sales and purchase agreement (SPA) for the supply of LNG to Malaysia. The agreement marked the first long term LNG deal between the two energy powerhouses. By partnering with QatarEnergy, Petronas not only strengthens its supply portfolio but also enhances its ability to meet the demands of both domestic and international customers. Under the terms of the SPA, QatarEnergy will deliver 2mt/yr of LNG to Malaysia beginning in 2028.

### Demand boom

LNG feeds into the narrative of energy addition rather



than substitution as well as supporting newfound electrification growth in mature economies and replacing coal and oil in developing ones. Petroleum Economist argues the narrative is too soft: energy multiplication is the new reality.

Indeed, growth in global demand for natural gas and, in particular, LNG will far surpass previous expectations, driven by rising energy consumption in developing economies as well as increased electrification and, more recently, the rise of AI and datacentres, said delegates from some of the world’s largest oil and gas companies.

ExxonMobil CEO Darren Woods said gas uniquely addressed the need to provide affordable and reliable energy while also reducing emissions, adding it would be used for decades in the future.

The outlook for gas is supported by the pace of growth in energy demand, Shell CEO Wael Sawan said. “The world is adding the energy demand of Switzerland every single month at the moment and will continue to do so up to 2050,” he noted. “And gas has a particularly important role to play.” Gas is the fastest-growing non-renewable energy source, he added, with demand for LNG specifically increasing at an even faster pace. Driven by increased energy consumption, primarily in Asia, Shell’s

# Global LNG Dynamics: An Industry Perspective

## Moderator



**Michael Stoppard**  
Principal  
Stoppard Energy

## Panelists



**Ryan Lance**  
CEO  
ConocoPhillips



**Darren Woods**  
CEO  
ExxonMobil



**H.E. Saad Sherida Al-Kaabi**  
Minister of State for  
Energy Affairs,  
State of Qatar,  
President and CEO  
Qatar Energy



**Wael Sawan**  
CEO  
Shell



**Patrick Pouyanné**  
Chairman and CEO  
TotalEnergies SE



latest LNG Outlook projects a 60% growth in LNG demand by 2040. H.E. Minister Al-Kaabi said the country's planned massive expansion of LNG capacity reflected its firm belief that gas demand will rise more quickly than once assumed.

TotalEnergies CEO Patrick Pouyanné noted the dramatic reappraisal of natural gas that had occurred over the past three decades since he joined the industry. "When we were exploring and found gas, it was considered a failure. To monetise the gas was really a challenge," Pouyanné said, adding that falling LNG costs and improvements in technology had transformed the fuel into a cornerstone of the modern energy system.

## Energy security is world's number one priority

For all the talk of the energy trilemma—affordability, security and sustainability—it has become clear that security precedes affordability, and affordability precedes sustainability. Without access to reliable energy supplies, prices will be too high, and the mantra of 'any energy will do' will rear its head. This was evident from Europe's pivot from Russian gas and towards LNG, which plugged the reliable, flexible lower-carbon gap to meet the continent's power needs.

"It's thanks to natural gas that we'll be able to go to-

wards a lower-carbon economy. You've seen that happen in the US, and you've seen that happen in Europe, where already today a lot of natural gas is utilised. But elsewhere in the world, as part of the energy mix gas is still relatively small," Baker Hughes CEO Lorenzo Simonelli pointed out.

**The world is adding the energy demand of Switzerland every single month at the moment and will continue to do so up to 2050 – Sawan, Shell**

## Don't forget technology

While AI is seen as creating a demand boom, the digital and technological revolution is bringing about new efficiencies, greater safety and reliability, and helping solve some of the challenges around security, sustainability and affordability.



# Momentum Behind Hydrogen and Ammonia Falters

Low-carbon hydrogen and ammonia development is advancing much more slowly and unevenly than once expected, with high costs and policy uncertainty thinning investment. Meanwhile, surging energy demand is reinforcing the role of natural gas and LNG as the backbone of the global energy system | **Joseph Murphy, Senior Gas Analyst, *Petroleum Economist***

Momentum behind the development of low-carbon hydrogen and ammonia as energy sources has noticeably cooled over the past two years, with projects advancing unevenly amid high costs, policy uncertainty and weak commercial pull.

At LNG2026's 'The Catalyst for Hydrogen and Ammonia' session, panellists said that, while hydrogen and ammonia continued to attract some strategic interest, progress has been slower and messier than anticipated. FIDs have thinned after a peak of enthusiasm in 2023. At the same time, accelerating energy demand—driven in part by AI—has reinforced the role of natural gas as an anchor fuel rather than a temporary bridge.

## A reality check

Ed Crooks, vice chairman of energy Americas at Wood Mackenzie, said expectations for hydrogen deployment have been repeatedly reset. Projects have clearly under-delivered relative to earlier optimism.

One of the clearest illustrations of this gap between ambition and delivery is the EU. Under its REPowerEU strategy, Brussels set a target of 10mt/yr of domestic green hydrogen production and a further 10mt/yr of imports by 2030. But current output remains negligible

and there remains a lack of credible pathways to secure large-scale imports.

Despite limited FIDs, some projects continue to advance incrementally, and policy frameworks have been further developed, Crooks said. But by the end of the decade, global low-emissions hydrogen production from projects either already operational or that have reached FID are only set to reach 4.2mt/yr by 2030, the IEA said in a review last September.

Crooks argued that the near-term opportunity lies less in greenfield megaprojects and more in reducing the carbon intensity of existing hydrogen and ammonia production. Cutting emissions from 'grey' hydrogen could deliver faster, cheaper abatement than waiting for large-scale green hydrogen markets to materialise. "These are quick wins," he said.

## Optional pathways

From an industrial technology perspective, Matt Spalding, vice president and general manager for MENA, APAC and India at Honeywell, argued that low-carbon fuels needed to be viewed as options to supply more energy rather than substitute existing sources such as natural gas. Energy demand is rising rapidly, he said, particularly

## We want to give our customers a range of different pathways for energy addition – Spalding, Honeywell

due to AI, and the system needs optimised use of existing assets, expanded access to LNG and greater optionality around lower-carbon fuels.

Spalding said Honeywell's strategy reflects that hierarchy. The company is investing in digital optimisation to extract more output from existing facilities, expanding LNG-related capabilities and selectively building exposure to low-carbon technologies such as sustainable aviation fuel and hydrogen. LNG, he said, remains a critical pillar rather than a sunset asset.

"We want to give our customers a range of different pathways for energy addition," he said.

That view was echoed by Nimit M Shah, vice president for global sales at KBR Sustainable Technology Solutions, who said natural gas continues to underpin energy security and industrial development. LNG projects, he argued, have benefited from decades of learning on scale, risk allocation and commercial structure—lessons that hydrogen and ammonia developers are still struggling to internalise.

Shah said policy can create momentum, but what markets lack is clarity—particularly around definitions of what qualifies as sustainable. Incentives without consistent standards have led to false starts, stalled projects and investor hesitation. Where clarity has existed, such as during early US tax credit announcements, activity surged, only to fade again as rules were revised or delayed.

On the marine side, Volkmar Galke, executive director of sales at WinGD, said fuel choice in shipping remains fundamentally commercial. Shipowners and charterers will not absorb higher costs indefinitely, making efficiency and flexibility paramount. Engine makers, he said, must offer optionality across LNG, methanol, ammonia and eventually hydrogen, even as LNG remains dominant.

Galke said ammonia is emerging as a more realistic candidate than hydrogen for shipping, given its role as a hydrogen carrier and the industry's existing experience handling it. WinGD has already completed type approval tests for ammonia engines and expects the first ammonia-fuelled vessels to enter service. Ports, he added, will play a critical role by offering incentives such as fast-track berthing and regulatory support, much as govern-

ments did with electric vehicles.

Across the panel, speakers repeatedly returned to cost. Green hydrogen remains expensive—often in the range of \$7–12/kg—but prices are falling sharply in regions such as India and China, where rapid renewable build-out has created surplus power that can be stored in hydrogen form. Crooks estimated the cost of green hydrogen at a mere \$3.5/kg. Shah and Spalding said those markets are developing hydrogen and ammonia not primarily for decarbonisation, but for energy security and diversification, with sustainability emerging as a secondary benefit.

## The infrastructure question

The question of repurposing existing LNG infrastructure drew scepticism. Panellists broadly agreed that LNG export facilities are too valuable—and increasingly too much in demand—to be converted wholesale to future fuels that remain commercially uncertain. Spalding said Honeywell sees more promise in repurposing underutilised refinery and chemical assets, including liquid organic hydrogen carriers, rather than displacing LNG.

"We expect to see an expansion of infrastructure for LNG use rather than a repurposing of that highly valuable infrastructure for future fuels that are still evolving," Mark McCrory, director for advocacy and strategic outreach at the International Gas Union (IGU), said.

## We expect to see an expansion of infrastructure for LNG use rather than a repurposing of that highly valuable infrastructure for future fuels that are still evolving –McCrory, IGU

At the same time, Galke cautioned against assuming parallel infrastructure for new fuels will be easy or cheap to build. As with LNG a decade ago, he said, ammonia and hydrogen infrastructure may look implausible until commercial demand crystallises—at which point it can scale rapidly.

In closing, Crooks said markets, not mandates, would ultimately determine outcomes. Policymakers can provide stability and predictability, but demand will be driven by cost, security and credible commercial partnerships. Hydrogen and ammonia will find roles, he said, but gas—and LNG in particular—will remain central to the energy system for years to come. •

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How does catalyst deactivation in a fixed-bed hydrotreater typically manifest in reactor performance, and what indicators should I monitor to determine when regeneration or replacement is needed?

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**AI Insight**

**Catalyst Deactivation in Fixed-Bed Hydrotreaters**  
Based on my knowledge repository, catalyst deactivation in fixed-bed hydrotreaters manifests in several ways and can be monitored through specific indicators:

**Manifestations of Catalyst Deactivation:**

- Poisoning and Activity Loss:** Catalyst deactivation is mainly due to poisoning, with the poisoned zone progressively moving down through the bed over time [Source 1]. As the active catalyst becomes insufficient, it may no longer maintain required performance levels.
- Temperature Increases:** To maintain constant hydrodesulfurization (HDS) activity as catalyst deactivates, reactor temperature must be increased, which can decrease product stability [Source 3]. This temperature increase is a clear indicator of progressive deactivation.
- Performance Decline:** After regeneration, catalysts may show poorer performance in subsequent cycles, indicating deactivation behavior [Source 7]. This can manifest as poor performance metrics from the start-of-run (SOR).

**Key Indicators to Monitor**

**Pressure Drop:**

- Pressure drop readings across the bed should be tracked over time to watch for possible catalyst attrition [Source 5].
- If bed pressure drop exceeds design limits, it may be time to change the catalyst due to degradation and activity loss [Source 5].
- Rapidly increasing differential pressure drop across the bed, even at startup, can indicate problems [Source 2].

**Product Quality Parameters:**

- Clieff breakthrough is used to identify when a catalyst bed nears the end of activity [Source 4].
- Poor performance in terms of bromine index (BI) and dienes can indicate catalyst deactivation [Source 9]



# Digital Transformation in LNG Goes Beyond the Buzz

Panellists at LNG2026 emphasised that digital investments in LNG are neither speculative nor automatic replacements for traditional capital projects. Instead, they require a new mindset | **Paul Hickin**

As digital transformation competes directly with capital intensive projects such as debottlenecking, new liquefaction modules and major brownfield upgrades, top executives explained at a panel discussion at LNG2026 that applying traditional capital discipline to digital investments is far from straightforward.

The experts—which included Bjarte Pedersen, senior vice president, energy industries, IMEA region at ABB; Joshua Divin, senior vice president at ABS; and Dominique Gadelle, vice president, early engagement gas & low carbon energies business line at Technip Energies—argued that, while digital twins, AI and automation benefits are now truly embedded in systems, the industry is still on a journey that requires humans as a backstop.

“Production optimisation solutions are becoming fairly predictable,” one executive noted. “You can reasonably calculate the expected return and evaluate them the same way you would other plant performance ini-

tiatives.” In these areas—advanced process control, real time optimisation and safety related analytics—digital tools deliver measurable gains in throughput, efficiency and stability. Their economics are familiar, and financial models tend to hold.

The complexity emerges in condition monitoring and predictive maintenance. Here, the promise of AI often defies the assumptions baked into conventional return on investment models. “If you tried to do a return analysis beforehand, it would probably not show how high the actual return ends up being,” one panellist said. Another pointed to recent industry examples where AI based condition monitoring eliminated nearly half of unplanned outages. “The return you get from this is unexpectedly high.”

This unpredictability creates a paradox. If digital projects are evaluated strictly through early financial projections, many would never be approved. As one speaker

put it: “If you follow the normal process, you would probably decide not to implement it.” The issue is not weak performance, but underestimated upside.

Participants argued that industries such as LNG must accept that some digital initiatives require a different decision framework—one that incorporates learning, uncertainty and scale. Digital tools are relatively low risk compared with mechanical modifications, require minimal shutdowns and can be tested without jeopardising production. “You can test it without taking a risk on your live plant,” one engineer explained. “And once it works on one train, you can replicate it across the others almost for free.”

A staged, portfolio style approach emerged as a recurring theme. Digital transformations begin with data—often imperfect, fragmented and locked inside legacy systems. “We learned the hard way that data engineers are even more important than data scientists,” one speaker said. “If your data isn’t clean, tagged and normalised, none of this works.” From there, organisations test pilots, learn quickly and scale what proves valuable.

Nowhere is the credibility challenge more visible than in digital twins. Long regarded as training tools or offline simulators, digital twins are evolving towards operational decision support and, eventually, automated control. “Digital twins have become a buzzword, but now they’re becoming real,” one participant said. “They’re moving from representation to augmentation of decisions.”

### Trust is key

Trust, however, remains the key factor. Credibility must be earned. One executive shared a breakthrough moment when a digital twin correctly identified a structural hotspot on a vessel. Inspectors were sent to a precise location, where they found a fracture exactly as predicted. “That’s how trust is built,” he said. “After that, people started asking for it to be live.”

## The most delicate question facing operators is whether digital twins should ever directly influence live setpoints in LNG trains

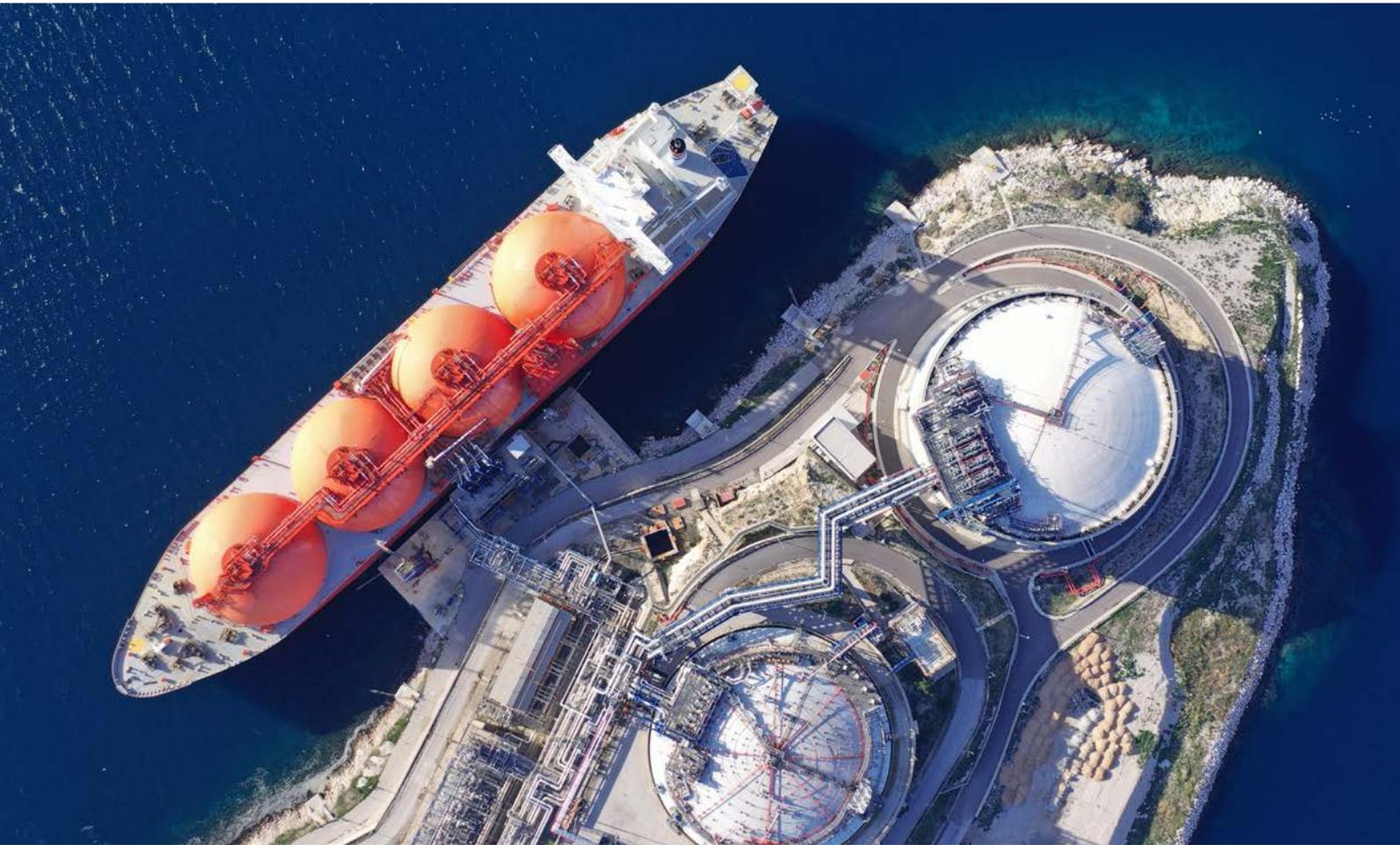
The most delicate question facing operators is whether digital twins should ever directly influence live setpoints in LNG trains. The consensus was nuanced. “For non controversial loops, we already let automation take over,” one panellist noted. In highly time critical scenarios, such as power grid disturbances or voltage drops, machines can react faster than humans and prevent trips.

Yet for broader operational optimisation, human oversight remains essential. “It’s a journey,” one participant said. “We’re gaining confidence, but safety must always be managed in parallel.” Any move towards autonomous control must pass the same rigorous safety gates as human decisions, including hazard studies, auditability and clear operating boundaries.

Black box logic, the group agreed, will never be acceptable. “It’s not just about doing what the algorithm says,” one speaker emphasised. “We need to know why. Traceability is critical.”

Ultimately, the discussion revealed that digital investments in LNG are neither speculative nor automatic replacements for traditional capital projects. Instead, they require a new mindset—one that balances belief in emerging capability with disciplined experimentation. As one participant concluded, “One day, digital twins will be comfortable taking decisions. But we will always want the ability to take control back.”





# Renewed Confidence in LNG

LNG2026 closed on a note of renewed confidence in the industry’s ability to deliver supply and retain a long-term role in the energy transition, even as questions persist over demand absorption, policy direction and the pace at which AI reshapes gas consumption | **Joseph Murphy**

The closing discussion at LNG2026 struck an upbeat tone, with panellists pointing to renewed confidence in the LNG industry that sufficient supply will be available in the coming years and greater conviction about the fuel’s long-term role in the energy transition. Still, uncertainty remains about how quickly that new supply will be absorbed, how policy will evolve and what role AI will ultimately play in reshaping demand.

Asked to sum up their takeaways from LNG2026, participants described the mood as “buzzing”, while others opted for “vibrance”. However, Jim Solomon, chairman of the LNG2026 programme committee and advisor to Honeywell emphasised “uncertainty”, referring to a lack of clarity about demand and supply trajectories post-2030.

That sense of uncertainty was much graver at the

LNG2023 conference in Vancouver three years ago. One participant suggested the industry now appears more comfortable that new supply will materialise and find buyers, even as the panel acknowledged open questions about timing, regional pull and the shape of demand growth.

Solomon noted that the conference had drawn an unprecedented almost 500 abstract submissions from around the world, spanning a range of topics from technology and processing to shipping, storage and new plant developments. That quality bar forced the committee to be selective.

The discussion repeatedly returned to the tension between strong investment momentum—particularly in new LNG capacity—and the risk that supply growth tem-

porarily outruns demand. Industry could reach a point where investments bump up against a near-term demand ceiling, creating a period when new volumes are available faster than markets can absorb them. Yet the tone was not one of panic; rather, the panellists said this potential oversupply was increasingly seen as manageable, and that cheaper LNG would stimulate incremental consumption over time.

The panellists also noted the shift in conversations about emissions and ESG, as concerns about energy security have risen in prominence. There was notably less focus on low-carbon hydrogen and ammonia in the conference agenda, and the panellists debated whether these fuels should be considered “a long-term play or a distraction”. Within the industry, though, reductions in operational emissions remain firmly on the agenda where improvements are practical and economic, such as efficiency upgrades and methane emissions abatement. This year’s edition of the conference saw greater focus on practical and implementable solutions over abstract positions. Delegates came looking for tools and approaches they can deploy today.

The cyclical habit of the industry to rally around a particular technology at each conference was noted. In past editions, there were successive waves of enthusiasm for floating LNG, modular LNG and small-scale LNG. A mature view is that there is a place for all of these technologies, depending on needs, geographies and commercial logic.

### Policy questions

Policy uncertainty was stressed as one source of concern—the difficulty the industry faces in navigating

mandatory requirements that can shift quickly, and the challenge of creating strategies that are robust enough to hold up under different policy outcomes. Among the messages to policymakers were that Southeast Asia should not backpedal on coal. The natural gas industry, given the significantly smaller environmental footprint of its product, has earned the right “to be mean to coal”, and should advocate for greater use of gas by better articulating its value in terms of security, affordability and sustainability.

**The gas industry itself, meanwhile, was urged to keep innovating, continue expanding energy access and be prepared for a wide range of outcomes in terms of how the market develops**

Another unknown is the pace at which AI-related energy demand grows, and where and how this growth will be met. Participants stressed that gas-fired power generation had a critical role to play.

The gas industry itself, meanwhile, was urged to keep innovating, continue expanding energy access and be prepared for a wide range of outcomes in terms of how the market develops. This will require the industry to be nimble and adaptive. •





# Specialty Chemicals' Strategic Role

Anwar Bacha, Qatar branch manager at REDA Chemicals, discusses how specialty chemical demand is evolving in gas processing and LNG operations, as well as the company's role in the natural gas and broader energy sector, its capabilities and how it works to improve the sustainability of its products and solutions | **Joseph Murphy**

## Could you outline REDA Chemicals' role in the natural gas industry, including the scale of the business and its geographic footprint?

**Bacha:** REDA Chemicals plays a strategic role in the natural gas and broader energy sector as a specialty chemicals distributor and technical partner, supporting operators across upstream, midstream and downstream applications. Through REDA Energy, we focus on delivering performance-driven chemical solutions tailored to the operational realities of the energy industry.

Our footprint spans Qatar, the Middle East, Africa and Asia, allowing us to combine strong regional presence with access to global expertise. We work closely with leading international manufacturers and local customers to ensure reliable supply, technical support and solutions adapted to each market's regulatory and operational requirements.

## Which recent projects does REDA Chemicals regard as its most significant achievements?

**Bacha:** REDA Chemicals has strengthened its position by expanding its energy portfolio in key gas-producing

markets, including Qatar, while deepening collaboration with global specialty chemical partners.

Key achievements include supporting customers with critical production and processing chemicals, enhancing supply chain reliability and delivering customised technical support for complex operating environments. These projects reflect our ability to act not just as a distributor, but as a solutions-oriented partner to the energy sector.

## How is demand changing for specialty chemicals in gas processing and LNG operations?

**Bacha:** Demand for specialty chemicals continues to evolve towards higher-performance, application-specific solutions. In gas processing and LNG-related operations, there is growing emphasis on efficiency, asset protection and operational reliability, driving demand for advanced corrosion inhibitors, oxygen scavengers, biocides and treatment chemicals.

At the same time, customers are looking for partners who can provide technical insight and formulation know-how, not just products. This trend reinforces the value of distributors with strong local presence and tech-



## Demand for specialty chemicals continues to evolve towards higher-performance, application-specific solutions

nical capability, particularly in complex and highly regulated markets such as Qatar.

### Looking ahead over the next five years, which geographies or segments offer the strongest growth opportunities for REDA Chemicals, and what capabilities will be most critical?

**Bacha:** Qatar and the wider Middle East remain key growth markets, driven by continued investment in natural gas, LNG infrastructure and downstream development. Africa and selected Asian markets also present strong opportunities as energy demand and processing capacity expand.

To capture this growth, the most critical capabilities will be deep application knowledge, strong supplier

partnerships, local technical support and agile supply chain execution. REDA Chemicals' regional structure positions us well to respond quickly to market needs while maintaining global standards.

### What steps does REDA Chemicals take to improve the sustainability of its products and solutions?

**Bacha:** Sustainability at REDA Chemicals is approached through responsible sourcing, product stewardship and technical optimisation. We work with reputable global manufacturers to ensure that the products we distribute meet international standards for safety, compliance and environmental responsibility.

In parallel, our technical teams support customers in optimising chemical usage, improving efficiency and extending asset life—helping reduce waste, emissions and overall environmental impact. This practical, application-focused approach allows us to contribute meaningfully to sustainability objectives across the energy value chain. •



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How do I reduce the risk of stuck pipe in a highly deviated well?

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**AI Insight**

Based on my knowledge repository, here are specific strategies to reduce the risk of stuck pipe in highly deviated wells:

Primary Prevention Measures

**1. Mud Weight and Fluid Management**

Proper drilling fluid treatment is critical. Regularly treat mud with bridging material of different sizes and concentrations to support unstable zones and plug porous annuli across the wellbore. [Well decommissioning: Simple...](#) The drilling fluid should maintain appropriate rheology while avoiding excessive pressure that could cause differential sticking. [Well decommissioning: Simple...](#)

**2. Minimize Stationary Time**

Reducing time spent stationary with pumps off significantly decreases stuck pipe risk. The majority of stuck pipe situations are observed immediately after making connections. [Latest advancements in...](#) Implementing continuous drilling practices, such as definitive dynamic surveys (DDS), can demonstrate the need to work pipe to release trapped torque and false static surveys, reducing stationary periods by approximately 7 minutes per connection. [Latest advancements in...](#)

**3. Optimize Drilling Parameters**

In vertical wells, avoiding challenging formations, avoid using excessive drilling parameters that don't increase ROP but simply dissipate energy against the formation, causing over-gauged holes. [Well decommissioning: Simple...](#) The excessive energy can lead to wellbore instability and stuck pipe conditions. [Well decommissioning: Simple...](#)

**4. Jar Placement Strategy**

Proper jar positioning is vital. When drilling across porous formations in build-up/landing sections where differential sticking risks are higher, keep the jar away from the porous formation to ensure it will activate effectively in case of differential stuck pipe. [Well decommissioning: Simple...](#) Run pipe in both tension and compression along the section, and communicate proper WOB limits to the driller. [Well decommissioning: Simple...](#)

**5. BHA Configuration**

For deviated wells, use slim BHA designs and implement specific connection practices customized for different ranges of overburden. [Well decommissioning: Simple...](#) In curve sections, port the bit RSS (rotary steerable systems) require less pressure drops, reducing total standpipe pressure and the chance of formation without [Well decommissioning: Simple...](#)

**6. Advanced Pipe Recovery Systems**



# Engineering Intelligence at the Core of Digital Transformation

Ahmad Farshoukh, general manager at ITCAN Solutions, shares his perspective on digital maturity, data confidence and the role intelligent engineering will play in shaping the future of the oil and gas industry | **Joseph Murphy**

**ITCAN Solutions works across the oil and gas value chain, helping organisations advance their digital maturity. How would you describe your strategic role in digital transformation efforts?**

**Farshoukh:** As the oil and gas industry accelerates its digital transformation journey, the focus is increasingly shifting from adopting individual technologies to building trusted, contextualised data foundations that enable confident decision-making. At the centre of this evolution is ITCAN Solutions, a digital system integrator supporting asset-intensive organisations across the value chain.

Digital transformation in oil and gas is now defined by the ability to establish a reliable foundation where engineering and operational data are trusted, understood and acted upon rather than by the deployment of individual tools or platforms.

ITCAN Solutions' strategic focus is on aligning complex engineering information with operational decision processes. We work at the intersection of engineering, data and digital platforms, enabling clients to move from fragmented information landscapes to connected, intelligent environments.

By structuring data, preserving context and ensuring continuity across the asset lifecycle, we help organisations advance their digital maturity in a way that delivers measurable value, not just technological change.

**Can you highlight recent projects that best demonstrate ITCAN's technical capabilities and value delivery?**

**Farshoukh:** Some of our most impactful projects are those where digital transformation directly supports visibility and operational confidence.

We have worked with major oil and gas companies across the Gulf, supporting them through challenges ranging from fragmented legacy data and limited asset

visibility to inefficiencies at the engineering-to-operations handover stage.

Our scope has spanned intelligent 3D modelling, reality capture and laser scanning, intelligent engineering and structured asset information management, ultimately delivering a clear, end-to-end view of internal processes, supported by structured information that is readily accessible across teams.

What made these projects particularly impactful was not the technology itself but how it was applied and aligned to real operational needs such as safety planning, faster decision-making and reduced rework.

**Many operators struggle with data quality and integration despite embracing digitalisation. What obstacles do you see most often, and how does ITCAN address them?**

**Farshoukh:** One of the biggest obstacles we see is the assumption that data problems can be solved late in the process. In reality, data quality and integration challenges often originate during engineering and project execution.

Information is created across multiple disciplines, tools and contractors, often without a unified structure or governance model. By the time operations begin, teams inherit large volumes of data that are difficult to trust or navigate.

ITCAN addresses this by focusing on data foundations, structuring engineering data, defining governance principles and ensuring information remains contextual and usable beyond project delivery. This approach reduces friction later and allows digital initiatives to succeed at scale.

**Data integrity and context are essential for digital twins and advanced analytics. How does ITCAN ensure clients can trust their data?**

**Farshoukh:** Trust in data comes from consistency, context and traceability.

## As the oil and gas industry accelerates its digital transformation journey, the focus is increasingly shifting from adopting individual technologies to building trusted, contextualised data foundations that enable confident decision-making

Our approach combines asset information management, intelligent engineering practices and platform integration to ensure that data is not only accurate but also meaningful. We focus on preserving relationships between assets, documents, models and operational data so users can understand not just what the data says, but what it relates to.

This contextual intelligence is what enables digital twins, analytics and AI-driven use cases to deliver reliable insights instead of assumptions.

### With offerings spanning digital twins, engineering support and consulting, how do you tailor your services across different oil and gas segments?

**Farshoukh:** Each segment of the oil and gas value chain has its own priorities, but the underlying challenge is often the same: managing complexity across engineering, operations and safety-critical environments.

In upstream projects, the emphasis is typically on engineering accuracy, safety assurance and early-stage decision support. Across midstream and downstream operations, priorities extend to asset integrity, operational reliability and continuity, all under strict safety and compliance requirements.

Our role is to tailor our services to these contexts while maintaining a consistent, trusted data foundation. We integrate multidisciplinary engineering scopes in a way that directly supports operational outcomes: process data to preserve design intent and operational logic; instrumentation, 3D and electrical information to ensure control, safety and system reliability.

Our approach also includes creating intelligent P&IDs with accurate as-built comparison, ensuring engineering changes are captured and validated, while asset information remains reliable and usable across day-to-day operations.

### Looking ahead, which technologies will most reshape oil and gas operations, and how is ITCAN preparing for them?

**Farshoukh:** Technologies such as AI, real-time analytics and cloud integration will undoubtedly reshape the industry, but their success depends on one thing: data readiness.

Without structured, contextualised data, advanced technologies cannot deliver their full potential. ITCAN is positioning itself by helping clients build the engineering intelligence required to support these technologies, ensuring AI and analytics are applied on a foundation of trust, not guesswork.

We see digital twins evolving from visualisation tools into decision support environments, and our focus is on enabling that transition responsibly and sustainably.

### Sustainability and efficiency are increasingly linked. How can digital transformation support both?

**Farshoukh:** Sustainability and performance are no longer separate objectives. Digital transformation plays a critical role by enabling organisations to understand their assets better, operate more efficiently and reduce unnecessary interventions.

From design changes and maintenance planning to shutdown preparation and asset modifications, every decision carries both operational and environmental consequences.

Digital transformation creates value by ensuring those decisions are made on accurate, current, and contextualised engineering information. When teams gain a clear view and understand asset conditions, system dependencies and historical changes, they avoid unnecessary site interventions and minimise unplanned activities that increase emissions, waste and exposure.

### As LNG assets grow more complex and experienced engineers retire, how can digital engineering environments help preserve critical knowledge, support faster onboarding and ensure safe continuity across project phases?

**Farshoukh:** Digital engineering environments play a critical role in preserving knowledge by embedding engineering intent, asset relationships and historical changes directly within a structured digital framework, rather than relying on individual experience or fragmented documentation.

Once data is structured and tagged, it is consolidated into a single data hub that provides direct, contextual access to engineering information. This allows new engineers to quickly understand how assets were designed, modified and operated over time, significantly shortening onboarding cycles and reducing reliance on informal or undocumented knowledge transfer.

For LNG organisations, this approach ensures that critical engineering knowledge remains accessible, consistent and safe to use across project phases and generations of the workforce. •



# Colombia races to shore up gas supply

Gas is a central pillar of Colombia's energy system, but declining production poses a significant challenge, and LNG will be increasingly needed as a stopgap. A recent major offshore gas discovery offers hope, but policy improvements are also required, Camilo Morales, secretary general of Naturgas, the Colombian gas association, tells *Petroleum Economist* | **Joseph Murphy**

Colombia has the technical capacity to slow—and potentially reverse—a sharp decline in domestic natural gas production through new offshore developments, while using LNG imports as a short- and medium-term backstop. However, policymakers need to move quickly to restore investor confidence and accelerate stalled domestic projects, the secretary general of the Colombian Natural Gas Association (Naturgas), Camilo Morales, told *Petroleum Economist*.

Natural gas remains a central pillar of Colombia's energy system, supplying homes, industry, transport and power generation, yet falling reserves and slowing exploration have pushed the country into imports for the first time in years.

"Natural gas plays a fundamental role in Colombia," Morales said, noting that more than 36m people use gas every day, and nearly 70% of households are connected to the network. In 2024, more than 384,000 new users were connected, and this growth "highlights natural gas as an effective tool for improving quality of life and reducing energy poverty", he said.

However, the supply outlook has deteriorated rapidly. Colombia's gas self-sufficiency has fallen from more than 13 years to 5.9 years after proven reserves dropped by 13% in 2024, Morales said. Local production declined by almost 16% compared with the previous year's average, forcing the country to rely increasingly on LNG imports, which broke a new record in December 2024, to meet essential demand.

Imports accounted for 7–20% of gas consumption in 2024 and 2025, he said, leaving the system operating close to its limits and with little margin to absorb unexpected disruptions.

In the short term, natural gas will remain the backbone

of Colombia's energy system, Morales said, pointing to the 2024 El Nino weather pattern, when gas supplied up to 30% of thermal power generation and helped prevent power shortages in the country's hydropower-dominated energy system.

Without new reserves and production, however, Colombia's reliance on imported gas could rise to about 26% of supply by 2027 and exceed 50% by 2029, according to Naturgas.

"Colombia's challenge is not a lack of resources," Morales said. "It is a lack of decisive action."

## Colombia's challenge is not a lack of resources. It is a lack of decisive action

### Offshore hope

A major potential turning point is the Sirius offshore gas discovery near Santa Marta, found by Brazil's Petrobras and Colombia's state-owned Ecopetrol in December 2024.

Morales said Sirius could supply 40–50% of Colombia's gas demand once in operation and could double the country's current resource base. Previous estimates have put the project's potential at up to 6tcf (170bcm) of gas. The project is tentatively targeted for launch in 2029 or 2030.

"The regulatory authorities are positive towards this

project,” Morales said, but he added that progress has been slower than the industry would have liked, particularly regarding consultations with local communities. “In that sense it is moving really slowly,” he said.

Naturgas says timely licensing, prior consultations and financial closure are essential if Sirius is to help reverse Colombia’s growing dependence on imports.

Onshore projects could also provide near-term relief. The industry has identified developments in Córdoba, Magdalena and Casanare that could add the equivalent of roughly 6% of current domestic gas demand by 2027, Morales said. These projects are based on proven resources but require faster permitting, interconnections and transport infrastructure.

### LNG as backstop

LNG imports are increasingly serving as a safety valve while domestic production recovers. Morales said the global LNG market has become more flexible and diversified, allowing Colombia to source gas from multiple suppliers.

However, imported gas is more expensive and expos-



## We need to create a legal certainty for international investors—investments in natural gas can have a cycle of 7–15 years, and the country needs to protect those investments on a long-term basis

es the country to international price volatility, he said, meaning LNG should remain complementary rather than a permanent foundation of the energy mix.

“The long-term solution is to increase gas production within Colombia,” Morales said.

A robust global LNG market paired with well-executed, national strategic projects is the best path to supply security and competitiveness, he added.

### Energy security and social impact

Morales said natural gas underpins energy security by providing a constant, reliable fuel for households, industry and transport while reducing pollution compared with alternatives such as coal, diesel or firewood.

In homes, switching to gas improves indoor air quality and reduces health risks. Despite progress, nearly 8.1m Colombians still live in energy poverty, and 56.6% of those households continue to cook with firewood or other highly polluting fuels, according to the 2024 Multidimensional Energy Poverty Index.

In transport, vehicles powered by natural gas cut particulate matter emissions by almost 99.9% and nitrogen oxides by up to 75% compared with liquid fuels, Morales said.

For industry, natural gas can reduce carbon dioxide emissions by up to 40% versus coal, while avoiding local pollutants and supporting competitiveness.

Overall, he said, gas combines reliability, lower emissions and social benefits in a way that few other fuels can currently match.

### Policy uncertainty

Morales blamed much of the production decline on policy decisions taken under the current government, which came into power in August 2022, including restrictions on awarding new exploration and production contracts.

The National Hydrocarbon Agency, which allocates areas for exploration, was instructed not to offer new contracts, he said.

“It was a recipe for disaster. If you don’t have discoveries, you don’t have reserves and you don’t have production,” Morales said, adding that the drop-off in new

## Continuing to produce safe and reliable natural gas remains one of the most practical and effective ways to reduce emissions and ensure the country's energy reliability

projects has accelerated over the past five years.

The government had reasoned that Colombia's abundant solar, wind and hydropower resources mean oil and gas should gradually be left behind.

Morales said that approach ignores the realities of energy security, investment cycles and the continued social role of gas.

Investment in natural gas projects typically requires 7–15 years, he said, making legal certainty essential.

"We need to create a legal certainty for international investors—investments in natural gas can have a cycle of 7–15 years, and the country needs to protect those investments on a long-term basis," he said.

Colombia holds congressional elections in March and presidential elections in May, which Morales said creates an opportunity for a policy reset.

A new government should establish a legal framework to protect long-term investment, improve efficiency in permitting and regulation, and work more closely with local communities to shorten consultation timelines, he said.

### Lower-carbon gases

Alongside conventional gas, Colombia is advancing

lower-carbon alternatives such as biogas, biomethane and hydrogen.

Morales said biomethane and biogas offer stronger near-term potential than hydrogen because the technology is mature and cheaper, and because Colombia has large volumes of agricultural and landfill waste that can be converted into energy.

Sector studies suggest biomethane could supply up to 15% of Colombia's current gas demand.

A biomethane plant launched in Medellín in 2023 already injects gas into the network, supplying nearly 40,000 households and cutting emissions by about 12,000t/yr. New projects are expected to benefit more than 25,000 additional households.

Biogas can also serve remote areas that lack access to gas pipelines, supporting rural development and circular-economy models.

Colombia established a hydrogen roadmap in 2024, and gas-sector companies are developing pilot projects—mainly in industrial hubs such as Cartagena—using natural gas as a feedstock combined with emissions reduction and capture technologies.

Morales said globally, hydrogen was now considered "more aspirational" than a few years ago, reflecting a shift in policy focus, but remains a medium-term solution, particularly for hard-to-electrify industries.

The energy transition, he said, is not about abruptly replacing one energy source with another, but about gradually adding solutions.

"Continuing to produce safe and reliable natural gas remains one of the most practical and effective ways to reduce emissions and ensure the country's energy reliability," Morales said.



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