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29TH WORLD GAS CONFERENCE

WGC2025

BEIJING, CHINA 19-23 MAY - THE WGC2025 DIGEST

TUESDAY 10 JUNE 2025

FAREWELL TO BEIJING!

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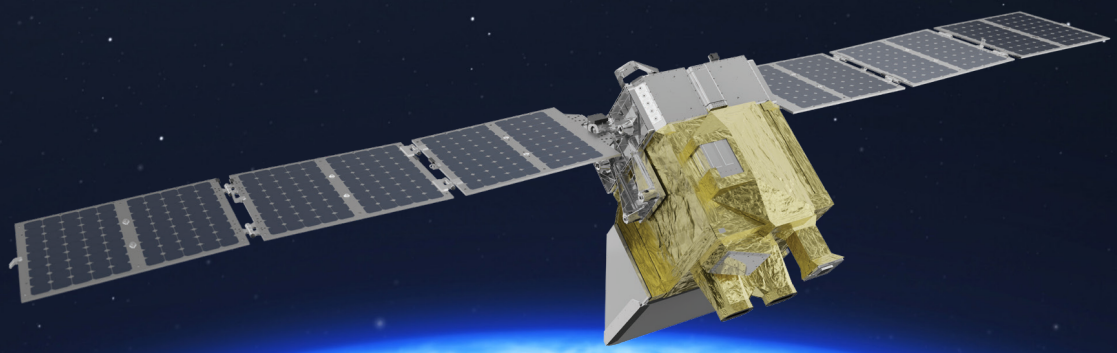

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IGU GLOBAL GAS AWARD

Congratulations to the winners of the IGU Global Gas Award, recognising projects that address key energy challenges with practical solutions, highlighting the societal benefits of natural gas adoption.

J.B.W. (Bert) Wikkerink
R. (Rosemarie) Van Eekelen
R. (Ruud) Mooij
R.W. (Ricardo) Verhoeve

Abstract title: OGMP 2.0 Methane Emissions Reporting; The Dutch Approach

WGC2025 REGIONAL GAS AWARD

We're excited to announce the *WGC2025* Regional Gas Award winners, celebrating innovative research focused on specific regions and reflecting the unique opportunities and challenges of those areas.

AFRICA

Emeka C. Ene
Debo Fagbami
Kingsley Idedevbo
James Ogunleye
Sahhed Hammed

Abstract title: The Successful Implementation of a Methane Gathering and Abatement Project Located in Kwale, Nigeria, by Leveraging Carbon Financing

EUROPE

Pierre Jean
Thierry Reynaud

Abstract title: Artificial Intelligence for Vibration Anticipation on the Storage Plant Pipeway Based on Vibration Sensors and Process Data

NORTH AMERICA AND OCEANIA

Dennis R Van Puyvelde

Abstract title: A Portfolio of Policies to Support Renewable Gas

ASIA

Xiangguang Zhou
Li Liu
Wenkuang Wu
Liuruo Han

Abstract title: Unlocking Insights: Leveraging Large Language Models for Enhanced Knowledge Management in Natural Gas E&P Industry

SOUTH AND CENTRAL AMERICA

Samira García-Freites
Richard Rangel
Arnold Meriño
David Acosta
Marco Sanjuan

Abstract title: Hydrogen Permeation in Natural Gas Pipelines: Analyzing the Impact of the Diffusion Coefficient Variability and Temperature Influence

WGC2025 INDUSTRY AWARD

Congratulations to the *WGC2025* Industry Award winners for outstanding abstracts demonstrating significant research value across various sectors, aligned with the Call for Abstract themes.

SUPPLY, DEMAND, MARKET AND PRICES

Maarten Tjebbes
Joost Wempe

Abstract title: Important Aspects of Long-Term Gas Contracts in a Hub-Based Environment

NEW MOMENTUM FOR LNG

Mitzi St Rose

Abstract title: New Momentum for LNG - Small Scale LNG SUPPLY for the Caribbean

DIGITAL TRANSFORMATION

Marco Fabbro
Paolo Farina
Andrea Ciampalini
Fernando Bellotti

Abstract title: Geohazard Management on Italian Natural Gas Grid by Satellite Analysis and Use of Informatic Data Platform

METHANE EMISSION MITIGATION

Zhishan Tian
Jun Wang
Junhua Chen
Pengfu Lv
Xuran Chen
Shuting Wei
Xiantong Yin
Dahai Su

Abstract title: Evaluation of Methane Control and Drainage Fracturing Effect in Tight Gas Reservoirs

GAS NARRATIVES UNDER THE NEW CONTEXT

Erika Y. Ortiz-Montoya
Nelson H. Caicedo-Ortega
Carlos Alvarez-Vasco
Claudia M. Sichel-Crespo
Julio Cesar Devera-Gomez
Carlos Andrés Díaz Andrade
Andrés Aldana Rico
Cinthia Audivet
Marco E. Sanjuán

Abtract title: Biomethane and CO_2 Capture: Pioneering Colombia's Role in the Global Energy Transition

NEW GASES AND ENERGY TRANSITION

Choong Meng LAM
Hayati HUSSIEN
M Nazmi B M ALI
Jennyfer KUANJI

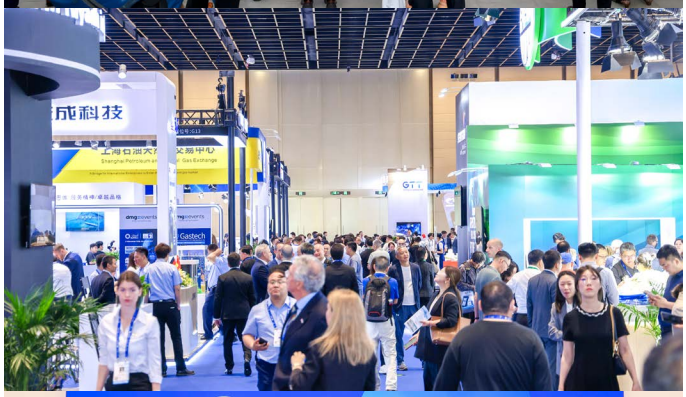
Abstract title: Re-Purposing of Existing Hydrocarbon Pipelines for CO2 Transport – The PETRONAS Approach

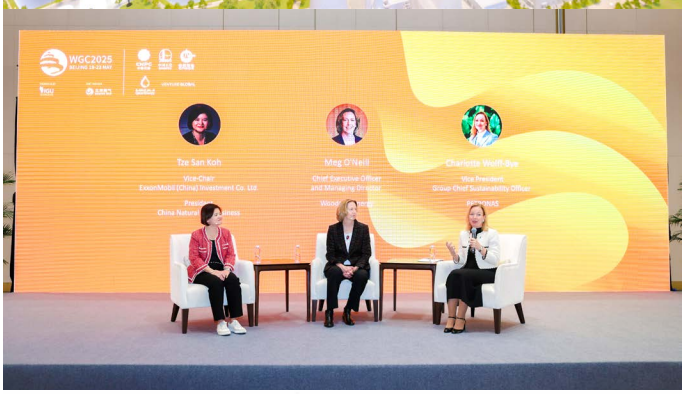
BEST PRACTICES THROUGH THE WHOLE VALUE CHAIN

Dr. Nadia Haddoum-Kherfellah & al.

Abstract title: Innovative Solutions to Overcome Drilling Instability in Carbonate Reservoir Wells

CONFERENCE AND EXHIBITION HIGHLIGHTS





IGU PRESIDENT: WORLD GAS CONFERENCE HELD IN BEIJING FOR FIRST TIME, BUILDS BRIDGE BETWEEN CHINA AND GLOBAL ENERGY INDUSTRY

THE CONFERENCE IS A WINDOW FOR CHINESE GAS COMPANIES TO SHOWCASE THEIR DEVELOPMENT ACHIEVEMENTS OVER THE YEARS AND BUILD A BRIDGE OF FRIENDSHIP BETWEEN CHINA AND THE GLOBAL ENERGY INDUSTRY, LI YALAN, PRESIDENT OF THE IGU, TOLD THE GLOBAL TIMES.

Li Yalan
President of the IGU

The 29th World Gas Conference, one of the three flagship events of the International Gas Union (IGU), known as the "Olympics" of the global gas industry held every three years, was held on May 19 to 23 in Beijing for the first time in its nearly 100 years of history.

In an exclusive interview with the Global Times on May 22, Li Yalan, President of the IGU, said that this conference is a window for Chinese gas companies to showcase their development achievements over the years and build a bridge of friendship between China and the global energy industry.

Li said that the successful holding of the World Gas Conference is a milestone for the development of the country's gas industry. It is an important stage for establishing international industry status, highlighting the country's industry development achievements, expanding international influence, and promoting international exchanges in the energy industry, she noted.

Established in 1931, the IGU is the world's largest international organisation in the gas industry. It covers more than 90% of the global natural gas market, and is composed of more than 150 members from 80 countries around the world.

The IGU plays an important role in advocating for gas development worldwide. As one of the countries with the largest number of members in the organisation, China has long attached importance to and supported the work of the IGU.

Li is not only the first Chinese president in the history of the IGU, but also the first female president in the history of the organisation.

When Li officially took office as the president of the IGU in May 2022, she started work amid many uncertainties, such as natural gas supply shortages and high energy prices. At the same time, the IGU, which has a history of more than 90 years, is also facing new situations and new problems – when the world is launching an energy revolution, and what role can China play.

As the head of the international organisation, Li said she mainly focused on two aspects after taking office.

The first is to further clarify the role and positioning of natural gas. When discussing energy development, countries and regions tend to emphasize one of the points of "sustainability," "safety" and "affordability," but in fact, it is necessary for the IGU to think about how to balance the relationship between the "energy triangle" and find a balance point, while avoiding putting too much emphasis on one end, Li said.

Natural gas is the world's third-largest energy source, with annual consumption of more than 4 trillion cubic meters, accounting for 24% of the energy mix. It is a key energy source for achieving the low-carbon energy transition and a clean fossil energy source. Replacing coal with natural gas is an effective measure to control air pollution, she noted.

At the same time, natural gas has the advantage of flexible regulation. As the best partner of renewable energy, the two can develop together. "With a specific and clear positioning, the confidence of the industry has been effectively increased," she said.

Meanwhile, China pays great attention to the imbalance of regional gas development, according to Li.

"We believe that different regions have different resource endowments and different stages of development. We should respect the choices of different countries in the process of the energy transition. We have proposed a development strategy for Latin American countries and added regional coordinators to distinguish Africa and the Middle East, which were originally classified as one region," Li said. "In order to reduce regional imbalances, we must make more voices and demands of different regions heard."

In the interview, Li said that the global energy transition must be based on security. The world is facing problems such as energy poverty, energy security and climate change, and the low-carbon energy transition is imminent. The global gas industry must strengthen its confidence and make greater contributions to addressing climate change, maintaining energy security, and promoting the sustainable development of the industry.

The World Gas Conference is known as the "Olympics" of the global gas industry. The difficulty of holding the 29th World Gas Conference in China for the first time was no less than the "Olympics bid." From the first participation in the election in Berlin in 2014, to the successful election in Tokyo in 2017, and then to the successful hosting of the conference in Beijing in 2025, it took a strong "sense of faith" to dismantle the difficulties encountered in the past decade, one by one, according to Li.

When talking about the source of this "sense of faith," Li said that "I still remember that I often heard the previous generation of the Chinese gas industry say, "I hope that one day a World Gas Conference can be held in China. Although there have been many twists and turns along the way, with the support of the country and the entire industry, with a strong belief, we finally realised this dream and fulfilled a dream of the people of China's gas industry!"

Li said that the IGU welcomes more Chinese companies and industry organisations to participate in the organisation's work and contribute Chinese wisdom to the development of the global gas industry. In this process, China can continue to strengthen the presence of the Chinese gas industry in the global governance system through a three-dimensional participation model, and also build a high-end resource connection channel for enterprises to "go global." ■

RIPED ON GLOBAL OIL AND GAS RESOURCES: POTENTIAL AND DISTRIBUTION

As one of the key thematic highlights on May 21, the Research Institute of Petroleum Exploration and Development (RIPED) under CNPC officially released the findings of its latest global oil and gas resource assessment, along with the launch of a new English-language monograph titled Global Oil and Gas Resources: Potential and Distribution.

Conducted during China's 14th Five-Year Plan period, the study systematically integrated new global exploration data, discoveries, and insights, redefining resource classifications and evaluation standards. It established a comprehensive assessment methodology applicable to different exploration stages and both conventional and unconventional resources. A total of 468 basins worldwide were reassessed, providing strategic reference for global energy development planning.

Academician Mr. Li Desheng of the Chinese Academy of Sciences, recipient of the AAPG Distinguished Achievement Award, wrote the foreword for the book, highly praising the study as a major step forward in China's scientific understanding of global oil and gas resources. Over 70 guests from institutions including S&P Global, Springer Nature, China University of Petroleum (Beijing), and the Oil & Gas Center of the Ministry of Natural Resources attended the release event. ■

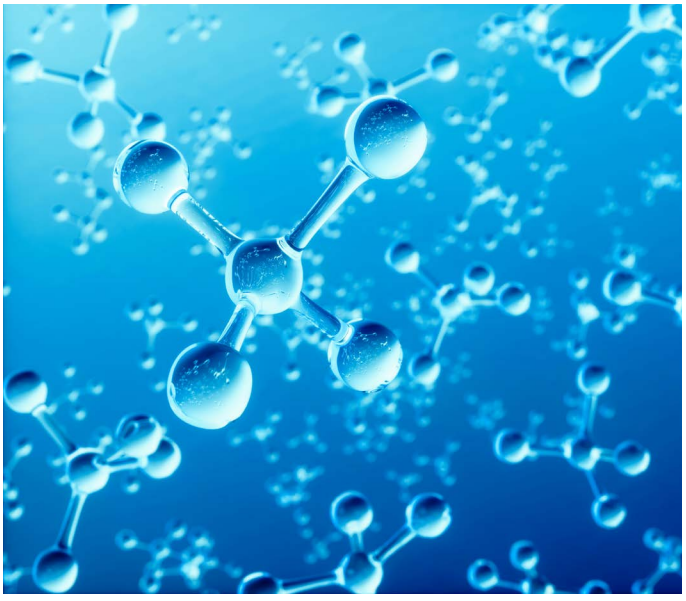
SINOPEC: NATURAL GAS HAS BECOME A VITAL PILLAR IN DRIVING THE GLOBAL SHIFT TOWARD LOW-CARBON ENERGY SYSTEMS

Mr Ma Yongsheng, Chairman of China Petrochemical Corporation (Sinopec Group), delivered the second keynote speech on plenary session themed "The Diversity of Gas Development Globally." He emphasised that natural gas, as the cleanest fossil fuel currently available, is increasingly being integrated with renewable energy and has become a vital pillar in driving the global shift toward low-carbon energy systems.

He noted that the Asia-Pacific region has emerged as the core engine of global natural gas demand growth, with China continuing to hold significant growth potential. Under the guidance of its dual carbon goals, China's natural gas consumption is expected to peak around 2035. Meanwhile, the global gas landscape is rapidly evolving: Europe is enhancing energy security by increasing imports of both pipeline gas and LNG; North America has become the world's leading LNG exporter; and the Middle East and Africa are accelerating their integration into global markets.

At the same time, gas trade volumes are expanding, pricing mechanisms are becoming more market-driven, and supply structures are increasingly diversified — helping mitigate uncertainties arising from geopolitical risks.

He stressed that in this critical phase of global energy transition, international cooperation is essential to unlocking solutions. Sinopec is ready to work with all stakeholders to enhance connectivity, improve emergency coordination, and jointly develop a regional pricing system for Asia. By seeking win-win progress amid diversity, the company aims to contribute stable momentum to the global green transformation. ■



CNOOC: NATURAL GAS HAS BECOME A KEY DRIVER OF GLOBAL ENERGY TRANSITION

On the morning of May 22, the plenary session themed "What is the Future of Global LNG?" was held. Mr. Zhou Xinhui, Board Director and President of China National Offshore Oil Corporation (CNOOC) and Vice Chairman and Chief Executive Officer of CNOOC Limited., delivered a keynote speech on the session. He emphasised that natural gas has become a key driver of global energy transition. As China's largest offshore oil and gas producer, CNOOC has consistently increased investment in resources and infrastructure over the past five years, with its imports of LNG accounting for about half of China's annual total. Driven by its offshore gas and LNG business, the company has played a pivotal role in safeguarding energy supply security. Zhou shared three insights on LNG:

Firstly, LNG's high flexibility makes it a vital safeguard for regional energy security amid escalating geopolitical tensions and frequent extreme weather events.

Secondly, as a clean and low-carbon energy source, LNG is playing an increasingly important role in supporting global green transition.

Lastly, the growth of LNG is not only reshaping the global gas market but also profoundly influencing the evolution of the world energy system. ■

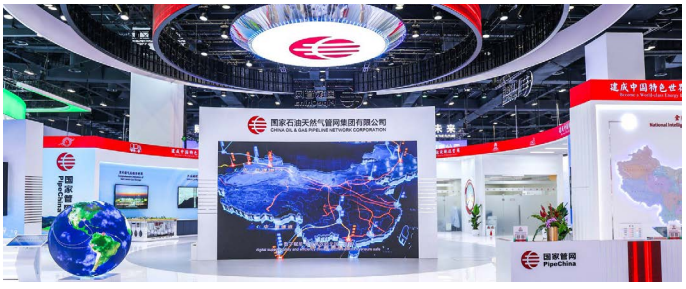
PIPECHINA MAKES DEBUT AT WGC2025, VOICING CHINA'S CALL FOR "DEEPER OPENNESS AND SHARING" IN GLOBAL ENERGY SECTOR

At the 29th World Gas Conference (*WGC2025*), under the theme of "Connecting the World with Pipelines, Sharing the Future through Openness", China Oil & Gas Piping Network Corporation (PipeChina) showcased its achievements in building a world-class energy infrastructure operator with Chinese characteristics. Through six core exhibition areas – Open Service and Trading Platform, Nationwide Integrated Natural Gas Network, LNG Terminal Business, Energy Storage Business, Intelligent Regulation and Technological Innovation – PipeChina presented its progress to over 3,000 energy industry representatives and technical experts from 70 countries and regions around the world.

The interactive experience zone drew particular attention, featuring an open service and trading platform that covers China's entire oil and gas infrastructure. This platform enables end-to-end rapid responses – from demand submission to intelligent route matching - comprehensively improving resource allocation efficiency. On the customer interaction side, an AI-powered customer service system supports dual-channel (voice/text) assistance, providing precise answers to customers' professional inquiries across all scenarios of the entire life-cycle while offering personalised recommendations based on historical interaction data.

By offering "single-ticket" and "one-stop" services, PipeChina has spurred rapid growth in market participation across the oil and gas sector, with downstream pipeline network users increasing to 1,300 (a 55% increase); shipper clients rising to 882; small and medium-sized shippers seeing nearly a tenfold growth in service volume; and single-entry capacity rose from 157bn cubic metres to 240 bcm.

Through optimised routing and reduced pipeline transportation rate, PipeChina has saved approximately RMB12bn ($1.7bn) annually in annual energy costs for society. This has motivated various domestic resource providers to boost reserves and output, leading to doubled coalbed methane production, significant increases in unconventional gas and offshore gas output, and a 42% growth in domestic natural gas production over five years. In addition, national apparent natural gas consumption has surpassed 420 bcm, resulting in an expanded share of natural gas in primary energy consumption. These outcomes highlight how PipeChina, as the "1" in China's "X+1+X" oil and gas market system, energises the entire industry by bridging upstream and downstream sectors. ■



BEIJING GAS GROUP UNVEILS NEW ACHIEVEMENTS IN CAPITAL ENERGY DEVELOPMENT

Beijing Gas Group has upheld the core values of "Gas Integrates All, Benefiting Every Household," continuously exploring new pathways in clean energy development. Through specialised, large-scale and market-based natural gas development, Beijing Gas Group has grown into an integrated energy supply service enterprise, featuring a pipeline network exceeding 36,000 kilometre in total size, an annual gas supply surpassing 24bn cubic metres, and full coverage across the whole natural gas industry chain.

As the organiser of *WGC2025*, Beijing Gas Group has created an immersive booth at the core area of the exhibition, themed "Practicing Safety and Green Initiatives, Energizing Better Lives." The booth showcases five key sectors – the integrated business model sandbox, Beijing Gas Group stories, digital intelligence technology, natural gas trade and new energy – through which the "Capital Model" is vividly interpreted. This presentation systematically reflects the remarkable achievements of Beijing's gas industry in achieving leapfrog development, and highlights the company's critical contribution to global energy transition and ecological improvement.

In the future, Beijing Gas Group will follow a "1+1+4" business layout, including the core business of gas, investment in the whole natural gas industry chain, as well as four growth poles of natural gas trade, integrated energy supply, integrated energy services and technological equipment R&D. This layout will promote coordinated development between the core business and growth poles. ■

SHENERGY GROUP: ADVANCING SAFER, MORE ECONOMICAL AND GREENER GAS DEVELOPMENT

At *WGC2025*, Shenergy Group showcased its achievements in the natural gas and new energy sectors, including the full natural gas value chain of production, supply, storage, and distribution, innovative gas safety measures, initiatives to improve the business environment, digital transformation in gas services as well as advancements in green electricity, green methanol and the "three vertical, three horizontal" hydrogen energy development strategy. In the context of China's carbon peaking and carbon neutrality goals and the acceleration of a new energy system, Shanghai Gas, a subsidiary of Shenergy Group, is committed to advancing the natural gas industry toward safer, more economical, and more environmentally friendly development.

Shenergy Group stated that it views this conference as an opportunity to enhance communication, explore innovative cooperation models, and work together to inject greater stability into the industry and promote the sustainable development of the natural gas market. ■

SHELL: OPTIMISTIC ABOUT LNG MARKET PROSPECTS AND KEEN TO HELP TO MEET CHINA'S EVOLVING ENERGY NEEDS

IN THE CURRENT CRITICAL PERIOD OF GLOBAL ENERGY TRANSITION, NATURAL GAS AND LNG PLAY A CORE ROLE. AS ONE OF THE LARGEST SUPPLIERS OF LNG TO CHINA AND SHELL IS KEEN TO HELP TO MEET THE COUNTRY'S EVOLVING ENERGY NEEDS, TOM SUMMERS, THE EXECUTIVE VICE PRESIDENT OF SHELL'S LNG MARKETING AND TRADING, TOLD CHINA ENERGY NEWS AT WGC2025.

China Energy News: As the world's largest LNG importer, China faces both energy security demands and the accelerated pursuit of its "dual carbon" goals. Against this backdrop, how is Shell leveraging technological innovation, strategic partnerships, and decarbonisation initiatives to balance short-term energy needs with long-term clean energy transition objectives in the Chinese market?

Tom Summers: Gas and LNG have a central role to play in helping to meet energy transition ambitions. For instance, switching from coal to gas has a notable effect on reducing carbon dioxide emissions as it emits about 50% less carbon than coal when used to produce electricity. Gas is also an increasingly important partner to renewable energy and the rapid roll out of renewable energy projects in recent years has highlighted this.

The growth of renewables still faces limitations, especially in powering hard-to-abate industries for which gas continues to be a reliable source of energy. The gas and LNG industry needs

to continue decarbonising the value chain in a number of ways, including introducing electrification at plants and integrating carbon capture and storage technologies, such as at Qatar's North Field East project in which Shell is a partner. We are also implementing other measures, including using technology to monitor and reduce methane emissions, and we accomplished the elimination of routing flaring in our upstream production earlier this year. The incremental blending of conventional LNG with other compatible fuels such as bio-LNG and, in the future, synthetic LNG offers pathways to net-zero emissions.

What do you think of the current development of the global natural gas industry? What remarkable changes have taken place in the global natural gas industry in the past few years?

The advent of LNG as a marine fuel has been a major success story over the last decade. LNG is the lowest-carbon fuel currently available at scale for the shipping industry, emitting up to 23% less greenhouse gas emissions (well-to-wake) compared to very low sulphur fuel oil. In recent years, the number of LNG or dual-fuel vessels has accelerated dramatically. In 2024, new commissions took the total number of LNG-fuelled ships to more than 1,000. Significantly, over three quarters of those orders comprised vessels with low methane slip engines. Over the last decade, Shell has developed an industry-leading LNG bunkering business. Today, our network offers 26 locations in 12 countries, enabling access to LNG as a marine fuel for more customers.

In addition, LNG is also having an impact in road transportation. Recent figures from China show that one in three heavy-duty trucks sold is now powered by LNG. In India, 2023 saw a 50% rise in sales of vehicles that run on compressed natural gas, according to official figures.

Under the background of energy transformation, what role will natural gas play as a relatively clean energy in the global energy structure? What are your company's strategic layout and measures in dealing with energy transformation?

According to industry forecasts, demand for LNG is set to grow by around 60% by 2040, which reflects its continued role in helping the world to transition to a lower carbon energy system. According to data from Wood Mackenzie, by 2040, natural gas demand is forecast to increase at double the rate of global energy demand. Shell's target is to become a net-zero emissions energy business by 2050. Specifically related to gases, Shell has played an important role in increasing production of biomethane, by partnering with producers and reaching agreements to kickstart sustainable growth. In 2023, Shell completed its $2 billion acquisition of Nature Energy, the largest biomethane producer in Europe.

Shell is also exploring opportunities across the hydrogen supply chain, including production, storage, shipping and end-customers solutions. Hydrogen has the potential to play a key role in the energy transition, through decarbonising hard-to-electrify sectors such as chemicals, steel, commercial road transport, aviation and shipping.

What are the new development trends of natural gas market in China? How does your company promote the sustainable development of domestic natural gas industry?

China has made significant progress in developing its natural gas infrastructure and has ambitious plans for the future. In recent years, the country has continued to approve the construction gas-fired power plants, providing long-term energy security in partnership with renewables and contributing to a lower carbon-intensity electricity sector. China is expected to add more gas-fired power capacity in 2024 and 2025 combined than the UK has in total. China is also moving ahead with developing regasification and storage facilities to help manage the seasonality of its gas demand. By 2030, it should surpass 250 million tonnes per year of capacity. By the same year, the country is aiming to provide gas connections to another 150 million people. We have seen in other countries that gas supply like this tends to endure: once residential areas and industries are connected to reliable gas supply, demand usually expands at a steady pace.

In tandem, China's domestic gas production is increasing. Electrification, operational efficiency, focusing on eliminating methane emissions and developing biomethane capacity, could help to make China's gas value chain more sustainable. ■

WOODSIDE: TECHNOLOGICAL INNOVATION DRIVES SAFETY AND ENVIRONMENTAL PROTECTION, WITH LNG DEMAND EXPECTED TO RISE 50% IN THE NEXT DECADE

WOODSIDE ENERGY CEO MEG O'NEILL DISCUSSED WITH CHINA ENERGY NEWS HOW THE COMPANY IS LEVERAGING TECHNOLOGICAL INNOVATIONS SUCH AS DRONE-BASED METHANE MONITORING AND SMART PERSONNEL SENSORS TO ACHIEVE ITS "ZERO HARM" GOAL IN ENERGY PRODUCTION. SHE ALSO PREDICTED A 50% SURGE IN GLOBAL LNG DEMAND BY 2030.

During the 29th World Gas Conference (WGC), Meg O'Neill, CEO and Managing Director of Woodside Energy, Australia's largest LNG producer, shared in an exclusive interview with China Energy News that the company is leveraging technological innovations such as drone-based methane monitoring and smart personnel sensors to achieve its "zero harm" goal in energy production. She also predicted a 50% surge in global LNG demand by 2030.

When asked how to balance operational safety, efficiency, and environmental performance, O'Neill emphasised, "Our employees are deeply committed to these principles, but technology also plays a critical role." She revealed that the company deploys drones to monitor methane leaks, "ensuring the minimisation of potential methane emissions," while equipping personnel with mobile sensors during drilling operations to "track heavy equipment movements in real-time and reduce safety risks."

Facing climate change and geopolitical challenges, O'Neill expressed strong confidence in the natural gas industry. "Population growth, economic expansion, and rising living standards all demand cleaner energy solutions," she analyzed. O'Neill highlighted LNG's advantages as a safer, more efficient, and transportable alternative with 50% lower carbon intensity than coal, stating, "Global LNG demand is projected to grow by 50% between 2024 and 2030."

Regarding the Beijing World Gas Conference, O'Neill identified "building human connections" as a core objective: "Participants from diverse cultural backgrounds gather here, creating unique collaboration opportunities for the industry." She specifically noted the potential of the Chinese market and the hospitality of the host country, adding that Woodside aims to deepen client relationships and explore new LNG sales opportunities through the event, as "trust and friendship are the bedrock of long-term business success." ■

TOWNGAS: DEEPLY ROOTED IN THE GAS INDUSTRY, CONTINUALLY INNOVATING CLEAN ENERGY SOLUTIONS

The Hong Kong and China Gas Company Limited (Towngas), a century-old enterprise, has long been deeply rooted in the gas industry. With flexible and innovative thinking and a broad strategic perspective, it continues to expand the space for green and low-carbon transformation, providing the market with safe, reliable and clean smart energy.

To promote energy conservation and carbon reduction, Towngas has invested in nine biomass natural gas projects in Shandong, Jiangsu, and Sichuan provinces, which collectively supply nearly 30mn cubic metres of green natural gas annually. The company is also actively involved in projects in blending hydrogen in natural gas pipelines and hydrogen energy. Notably, the "Hydrogen for Every Household" hydrogen blending project undertaken by Weifang Towngas in Shandong province has been approved by China's Ministry of Science and Technology. The project aims to achieve a 10% hydrogen blending ratio in urban gas pipelines, serving over 100,000 households.

In response to the decarbonisation needs of the transportation sector, Towngas is vigorously developing green methanol and sustainable aviation fuel (SAF) to support sustainable industry growth. Its green methanol plant in Inner Mongolia uses proprietary technology to convert biomass waste and used tires into green methanol. The company is planning to build a second green methanol production base in Foshan, Guangdong province. By 2028, the combined operating capacity of both bases will reach 500,000 tonnes per year.

To facilitate emission reduction in the aviation industry, Towngas is actively developing its SAF business by recycling illegal cooking oil into SAF, hydrotreated vegetable oil (HVO) and other renewable fuels. Its SAF production base in Zhangjiagang, Jiangsu province, currently supplies around 300,000 tonnes of SAF and HVO annually. A second SAF production facility in Malaysia is scheduled to begin operations later this year. ■

ZHEJIANG ENERGY GAS GROUP'S HYDROGEN-BLENDED NATURAL GAS PILOT PROJECT ATTRACTS ATTENTION

As an exhibitor at 29th World Gas Conference (*WGC2025*), Zhejiang Energy Gas Group Co., showcased its achievements and technological breakthroughs in the full natural gas industry chain at the event, with its hydrogen-blended natural gas pilot project and intelligent gas inspection system drawing significant attention.

According to reports, in 2024, Zhejiang Energy Gas Group successfully conducted combustion and separation experiments for China's first high-ratio (30%) hydrogen-natural gas blending in urban gas systems. This groundbreaking trial validated the technical feasibility of blending 3% to 30% hydrogen into natural gas and filled a gap in China's research on high-ratio hydrogen blending experiments using existing urban gas infrastructure. ■

SHANGHAI FIORENTINI: "FULL LIFECYCLE MANAGEMENT" MODEL RESHAPES INDUSTRY OPERATIONS

AS A GLOBAL LEADER IN GAS EQUIPMENT, SHANGHAI FIORENTINI SHARED ITS FORWARD-LOOKING STRATEGIES IN ENERGY TRANSITION, GLOBALISATION, AND SMART TECHNOLOGY APPLICATIONS, WHILE OUTLINING ITS ROADMAP TO SUPPORT CHINA'S "DUAL CARBON" GOALS, ITS DIRECTOR VITO CIRIELLI TELLS CHINA ENERGY NEWS.

At the 29th World Gas Conference (WGC), Vito Cirielli, Director of Shanghai Fiorentini Gas Equipment Co., Ltd., gave an exclusive interview to China Energy News. As a global leader in gas equipment, Shanghai Fiorentini shared its forward-looking strategies in energy transition, globalisation, and smart technology applications, while outlining its roadmap to support China's "Dual Carbon" goals.

Addressing the energy transition, Vito Cirielli emphasised that natural gas will serve as a "bridge" in the global energy mix, providing stability

for replacing coal and oil in power grids and industrial sectors while complementing renewable energy. He highlighted three strategic initiatives aligned with China's "30·60" Dual Carbon Goals: R&D in hydrogen-ready and biogas-compatible equipment, ensuring future-proof product lines. Smart infrastructure solutions, such as IoT-enabled meters and regulators to support digital transformation. Sustainability partnerships, working with utilities and policymakers to reduce fugitive emissions and enhance network efficiency.

Shanghai Fiorentini's products now serve over 30 countries. To address diverse international demands, Vito Cirielli explained the company's dual-drive strategy of combining international technical teams with localized services. For instance, it has established technical service centers in key markets and partnered with local suppliers to develop customized components, balancing performance and cost.

Also, the company pioneered modular skid-mounted station technology 20 years ago, reducing on-site construction time by over 80% through factory pre-fabrication and comprehensive testing, significantly improving project delivery efficiency.

Vito Cirielli emphasised that Shanghai Fiorentini's "Full Lifecycle Management" model is revolutionising industry operations. In recent years, Shanghai Fiorentini has assisted multiple gas companies in deploying mobile health diagnosis systems to real-time monitor the operational status of in-service pressure regulating station equipment and generate predictive maintenance recommendations. This initiative has successfully identified and resolved performance issues in operational pressure regulating facilities, preventing unexpected failures while enhancing operational efficiency. Also, integrated with AI and IoT, the system collects real-time pipeline pressure and flow data, dynamically optimising pressure regulation stations and enabling "intelligent peak-valley regulation," shifting clients from reactive repairs to proactive maintenance.

For the Chinese market, Vito Cirielli highlighted three trends: Growing gas demand in industrial and power generation sectors, accelerated construction of digital intelligent pipeline networks and rise of distributed energy models (e.g., LNG refueling stations).

In addition, as a "Specialized, Sophisticated, Innovative, and Distinctive Little Giant" enterprise, Shanghai Fiorentini will continue advancing localiSed innovation, building a nationwide "Gas Butler" smart operation network, and collaborating with academia to develop next-generation solutions for safer and more efficient industry growth. ■

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CHENIERE: BRINGING SUSTAINABILITY TO GLOBAL GAS

Robert Fee
Vice President, Policy, Government and Public Affairs, at Cheniere Energy

CHENIERE ENERGY, WHICH PIONEERED LNG EXPORTS FROM THE US GULF COAST IN 2016, IS NOW LEADING THE DELIVERY OF SUSTAINABLE LNG TO GLOBAL GAS MARKETS

Cheniere Energy, a leading US developer of LNG, has been diligent in its work to make LNG exports competitive as possible, not only from a cost perspective, but from an emissions perspective, according to Robert Fee, its Vice President, Policy, Government and Public Affairs.

In an interview with the *WGC2025 Daily*, Fee highlighted a recent update to Cheniere's life cycle assessment (LCA) study of greenhouse gas emissions from its LNG operations and its robust target of achieving Scope 1 annual methane emissions intensity of 0.03% from its two operating liquefaction terminals, in Corpus Christi, Texas and Lake Charles, Louisiana.

Both, he says, were informed by a robust quantification, monitoring, reporting and verification (QMRV) programme it launched in 2022 to measure and mitigate emissions across its supply chain and to understand how emissions might change through the seasonality of liquefaction facilities.

The 16-month QMRV programme — and similar work with five producers and midstream partners in 2021 — involved the deployment of a variety of emissions detecting technologies, including satellites, two different types of aerial monitoring, and on-the-ground verification with optical gas imaging (OGI) cameras.

Photo: ***The Corpus Christi liquefaction terminal in Texas, US.***

Source: Cheniere Energy

"AMBITIOUS BUT ACHIEVABLE" EMISSIONS TARGET

At the end of the QMRV programme, the data was analysed and put together into what is an "ambitious but achievable" methane intensity target, Fee said.

"One important point about that target is that it is a measurement informed target," he said. "Most every company in the world, if they have greenhouse gas emissions targets, they are based on engineering calculations, and that is activity data times an emissions factor. What we have seen over the last decade is that oftentimes those engineering calculations understate emissions, particularly with respect to methane, where there's quite a bit of volatility."

Cheniere's target, he said, is based on measured data, and its progress to meet that target will be tracked annually to identify emission sources and take action to mitigate them.

The updated LCA study, meanwhile, includes a gas-pathing algorithm that improves the modeling of GHG emissions across Cheniere's supply chain, using actual operational data from 2022. Paths are modeled from natural gas production basins through intrastate and interstate transmission grids to its Sabine Pass and Corpus Christi liquefaction facilities on the Gulf Coast.

Cheniere's QMRV programme, as well as the LCA update, were done in collaboration with a number of academic institutions — the University of Texas at Austin, Colorado School of Mines and Colorado State University — that have since formed the Energy Emissions Modeling and Data Laboratory.

STILL NO STANDARDISATION

And that work was done even before various certification platforms in North America — MiQ, Equitable Origin, Project Canary — began to take hold in the production sector. Cheniere's early QMRV work, Fee said, gives it a unique perspective of LNG's environmental impacts.

"The goal of those efforts, which we started before certification platforms were in place, was to try and understand how you can deploy these technologies to measure missions, but also how best to report them and verify them," he said. "And I think that's something that the US is still working on figuring out — there isn't standardisation amongst those programmes."

The QMRV collaboration, he said, also helps its upstream partners in their own emissions mitigation measures. Cheniere joined the Oil and Gas Methane Partnership 2.0 (OGMP 2.0) in 2022 and is encouraging its partners to do likewise. The company achieved OGMP 2.0's Gold Standard Pathway in 2024.

"For a globally facing LNG company, an international standard for measuring and reporting methane emissions is very important," Fee said. "Everyone is in a different place in their climate journey, and that's true in the LNG market as well. We're trying to provide industry with information through the learnings from our QMRV project and through OGMP to try and focus efforts on actions that do measure and mitigate methane."

> ***"Everyone is in a different place in their climate journey, and that's true in the LNG market as well."***

Although Cheniere is actively striving to make its activities as sustainable as possible, it doesn't necessarily agree with the widely held belief that exporting LNG to coal-dependent economies like those in Asia and parts of Europe will automatically move those regimes off coal, said Anatol Feygin, Cheniere's Executive Vice President and Chief Commercial Officer.

Gas and coal are roughly equal in terms of energy supplied, Feygin said, with LNG accounting for about 13% of all gas. That implies that LNG delivers about 3% of total primary energy.

CLEANER WITH GAS

"For whatever it's worth, I am of the view that we're not going to be displacing a lot of coal," he said. "What we hopefully will be doing is allowing end users to limit how much coal they consume."

China, for example, installed about 350 GW of renewables in 2024 alone that will need to be firmed either by coal or by dispatchable natural gas.

"It doesn't require that much natural gas to allow China to have a dispatchable source that is much cleaner than coal," he said. "And that combination (renewables supported by natural gas) is a very powerful one that we think will limit China's growth in coal consumption."

In an attempt to quantify the impact of US LNG on global emissions, the US Department of Energy, as part of the Biden Administration's pause on export approvals, conducted what has been called a consequential LCA to forecast the net GHG emissions profile of LNG. It looked not just at the emissions from LNG but also at future energy demand, what alternative energy sources might be used to meet that demand and what LNG would be replacing.

"What they found was that the net greenhouse gas profile of US LNG is dramatically lower than just the emissions profile of a cargo of US LNG, because of that replacement potential — and not just replacement, but actually stopping the future growth of coal," Fee said.

That might be useful from a policy or regulatory decision-making perspective, he said, but for Cheniere, which believes the fundamentals of the global LNG market remain strong, the focus is and always has been making its product as competitive as possible, from an operational and an environmental perspective.

"That's the foundation for everything that we do, meeting our customer commitments that differentiates us these days, and then, of course, taking action to reduce emissions across our supply chain so that our product is not only competitive on a cost perspective, but also from emissions."

Robert Fee is Vice President for International Affairs & Climate at Cheniere Energy. He spoke at the session "Energy and Climate Policy Shaping a Low-Carbon Energy Future" at 11:45 on May 21. ■

Photo: ***The Sabine Pass liquefaction facility in Louisiana, US***
Source: Cheniere Energy

ROSETTA ENERGY SOLUTIONS: THE CASE FOR VIRTUAL LNG PIPELINES


Karim Shaaban
CEO of Rosetta Energy

KARIM SHAABAN, CEO OF ROSETTA ENERGY, IS EXCITED TO SEE INCREASED FOCUS ON SMALL-SCALE LNG IN EMERGING MARKETS AT WGC2025.

Virtual LNG pipelines can expand energy access in remote areas, reduce reliance on costlier and more polluting oil fuels and support industrialisation in Africa, Karim Shaaban, co-founder and CEO of Rosetta Energy, a company pioneering such projects across the continent, told the *WGC2025 Daily*.

AVOIDING THE "CHICKEN AND EGG" PROBLEM

Developing a physical gas pipeline from a field to a customer is often capital-intensive and requires a large volume of supply and demand to justify the cost. This creates a "chicken and egg" problem, Shaaban said – "you have to have a committed and large enough market to justify building the gas pipeline."

Virtual LNG pipelines eliminate this need. Stranded gas can instead be liquefied and transported in 40-ft ISO containers via truck, sometimes beyond 1,500 km on the road, or shipped by barge along rivers, to where it is needed, even across country borders, regardless of a customer's relatively small volume requirements.

Moreover, the kind of economies of scale needed for major LNG export projects aren't necessary. "You don't need 170,000-m^3 LNG carriers or a 3-4mn t/yr liquefaction plant – small-scale LNG can be as low as 100,000 t/yr," Shaaban said. "With improvements in technology, we're seeing the costs of those liquefaction plants go further down."

Founded four years ago and acquired by Egypt-based Taqa

Arabia in 2024, Rosetta develops such projects, from investment and debt financing, to technical and commercial work, through to operations and maintenance. It handles pre-FEED work itself, though typically awards FEED to a third party, while also handling owner's engineering on its own, to prepare for awarding an engineering procurement and construction (EPC) contract. It also negotiates supply agreements to secure the gas to liquefy, and the sales and purchase deals with LNG customers.

KEY PROJECTS AND BENEFITS

Rosetta is currently working on two such initiatives in Mauritania and Tanzania. Both countries have abundant gas reserves, most of which remain undeveloped.

"In Africa, there is a lot of untapped natural gas, and at the same time, there is a lot of dependency on liquid fuels – whether that is diesel or heavy fuel oil," Shaaban said. Most of these fuels are imported and subject to volatile and often high international prices.

"On top of that, many African nations have industrial potential that is extremely underutilised," he said.

Many African countries are still relying on exporting raw materials, "But if they had more stable and affordable energy available – like gas – they could develop that into more high-yielding products," Shaaban said. "You can imagine the multiplier effect for the economy."

Mauritania, for instance, is a major exporter of iron ore. But with reliable and affordable energy supply, the country could develop industrial capabilities to process the ore into higher-value products such as iron pellets.

Supporting projects like this, Rosetta is working in partnership with Taqa and GoGas to liquefy gas from the 1.2 trillion cubic feet Banda field and supply it to mining operations in the country's north.

Likewise in Tanzania, Rosetta is working with Africa50 – an infrastructure fund set up by African governments and the African Development Bank – to purchase gas from the grid, liquefy it and ship it to the country's northeast for use in mining and other operations. A second phase could see additional volumes exported to neighbouring countries.

Both projects aim to supply energy at "substantially lower cost" than oil-based alternatives, Shaaban said. While savings vary, Rosetta typically targets a 25% reduction or more. First production in Tanzania is targeted for 2028, and for Mauritania a year later.

LNG is a cleaner energy source than oil products. Rosetta provides customers with assessments of how much they can cut greenhouse gas emissions by switching to natural gas. The company is also exploring ways to reduce emissions from liquefaction, including using electric driven trains and combining renewal power generation.

THE FINANCING CHALLENGE

Financing is the greatest challenge in developing Virtual LNG Pipelines, Shaaban noted. "To create those markets, you need to take some calculated merchant risk to get things going at the beginning," he said. "Getting lenders into that mindset can be difficult, but we are seeing improved understanding."

Large LNG export projects have the backing of major international oil and gas firms that can assume debt and have access to global markets. Rosetta, by contrast, typically works with smaller financial institutions already involved in gas-to-power, and with local and regional banks more willing to accept the higher risk of small-scale LNG. Larger development finance institutions often impose requirements that are too stringent for such projects.

Shaaban said international financiers have become more willing to fund fossil fuel projects in recent years, following geopolitical disruptions and the global energy crisis of 2021-2023.

"There is greater recognition that we still need natural gas in the energy ecosystem – that it can play a significant role as a transition fuel until renewables are scaled up, and that it will always be needed to complement renewables, because of their intermittency," he said. "We have really seen a shift in the narrative."

Given the economic multiplier benefits of small-scale LNG – such as enabling new industrial parks, factories and jobs – governments should offer strong fiscal incentives and provide flexibility on the gas feedstock cost, Shaaban added. "When people are looking to invest in new developments in a country, the key questions are: is the energy cheap enough? Is the supply secure? We are providing a solution there," he said.

"if [some African nations] had more stable and affordable energy available – like gas – they could develop that into more high-yielding products."

SMALL-SCALE LNG AT WGC2025

WGC2025 comes at a critical juncture in terms of shifting global gas supply and demand dynamics, with significant new LNG volumes set to arrive from the US and Qatar, while there is expected to be major growth in demand in key markets like China and India, Shaaban said. "I'm very keen to hear the global thoughts on these dynamics, as well as how the long-term pricing of LNG will evolve," he said. "I'm also excited to see there is more focus at the event around financing for small-scale gas in emerging markets, and look forward to participating in those discussions."

Karim Shaaban, Managing Director of Rosetta Energy Solutions, spoke at the session Natural Gas Enabling a Resilient, Secure, and Decarbonised Power System, at 10:45 on May 22. ■

LNG TO MAINTAIN KEY ROLE IN JAPAN'S ENERGY MIX THROUGH 2050 AND BEYOND

Satoshi Yoshida
Senior Advisor of the Japan Gas Association

JAPAN SEES LNG AS CRUCIAL TO ENSURING ENERGY SECURITY THROUGH THE ENERGY TRANSITION, WHILE PRIORITISING PROCUREMENT FROM SUPPLIERS WITH CLEAR DECARBONISATION STRATEGIES AND LEVERAGING ITS EXISTING NATURAL GAS INFRASTRUCTURE TO ADOPT E-METHANE AND OTHER LOW-CARBON GASEOUS FUELS IN THE FUTURE.

"The role of LNG in Japan's energy mix is crucial and will remain significant through 2050 and beyond," Satoshi Yoshida, Senior Advisor of the Japan Gas Association, told the *WGC2025 Daily*. While the country's LNG imports have declined in recent years, the country's 7th Energy Basic Plan, adopted by the government in February, positions the fuel as an essential energy source during the transition to a more sustainable future.

Japan's LNG imports currently stand at around 66mn tonnes, returning to pre-2011 levels before the Great Eastern Earthquake. "The sharp increase in LNG imports after 2011 was necessary to compensate for the loss of nuclear power generation," Yoshida explained. Thirteen years on, LNG's share in Japan's primary energy mix is only now returning to previous levels.

While Japan is committed to net-zero emissions by 2050 under the Paris Agreement, requiring reductions in both greenhouse gas (GHG) emissions and overall energy consumption, it remains focused on securing LNG imports, particularly from within the Asia region, to strengthen energy security. Yoshida stressed that LNG "will not only aid in GHG emission reduction but also enhance regional energy security."

Natural gas currently serves as the backbone of Japan's electricity system, accounting for 32.3% of power generation in 2023, according to the International Energy Agency (IEA), while coal in second place contributed 28.5%, and nuclear 8.5%. Lacking significant natural gas resources of its own, Japan relies on LNG imports to meet almost all of this consumption. Australia is by far Japan's top LNG supplier, leveraging its close geographical proximity to deliver over 40% of the country's supplies.

PROCUREMENT POLICY

Despite recent global supply constraints, Japan's LNG procurement strategy has remained largely unchanged over the last three years. Long-term contracts and diversified supply sources continue to be the pillars of its energy security policy. Japan has expanded supplier relationships and invested in upstream projects, while also pursuing more flexible contract terms, including renegotiating delivery and pricing conditions in long-term agreements. It also taps the spot market for additional cargoes to capitalise on temporary surpluses in global supply.

"I believe collaboration with neighboring countries to develop an LNG supply chain is vital for enhancing regional energy security."

An increasing share of Japan's LNG contracts now exclude destination clauses, granting procurement operators greater flexibility, Yoshida noted. He added that intergovernmental diplomacy is playing a key role in facilitating such contracts.

"I believe collaboration with neighboring countries to develop an LNG supply chain is vital for enhancing regional energy security," Yoshida said. "This includes working with Southeast Asian countries on joint investments in LNG infrastructure on both the supply and demand sides."

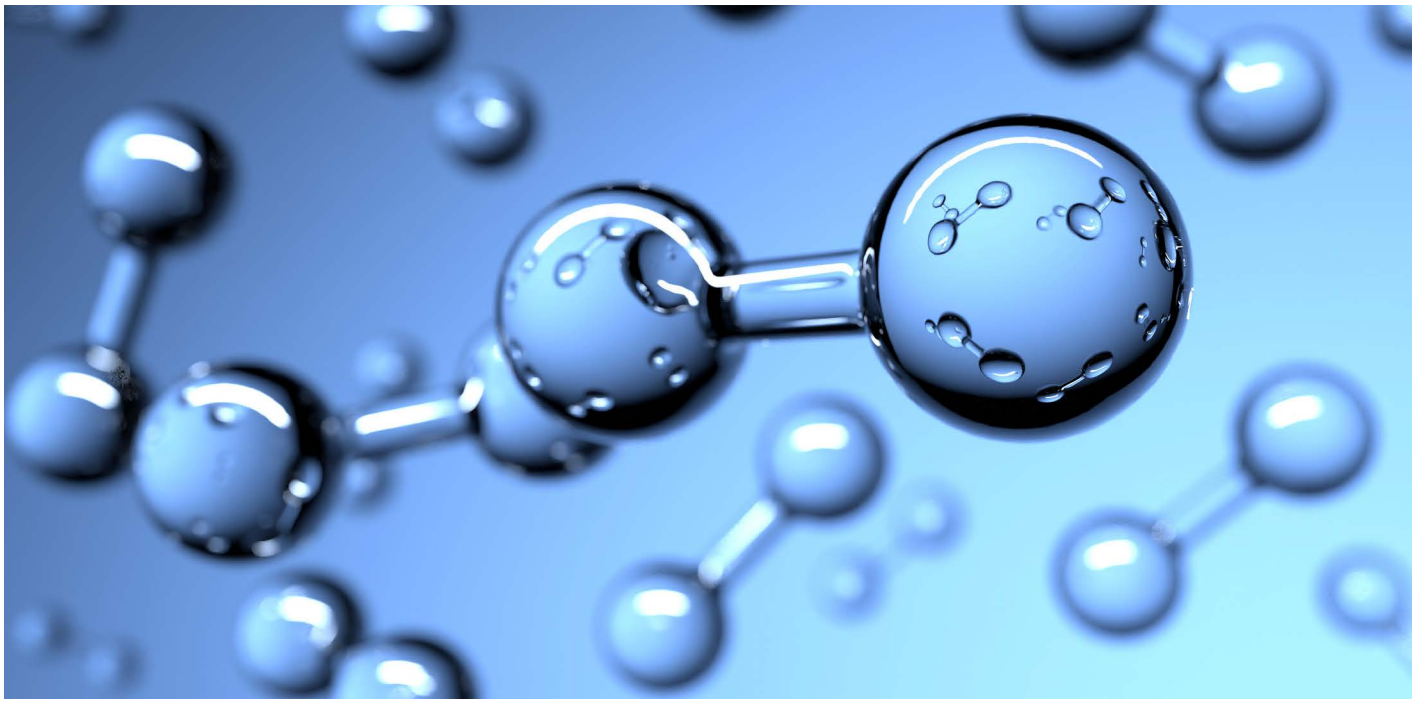
Japanese LNG importers are prioritising emissions reduction by sourcing fuel from suppliers with clear decarbonisation strategies across their supply chains, Yoshida said.

"Through supplier collaboration, investment in innovative technologies, life cycle assessments and contributions to carbon offset projects, importers aim to position themselves as responsible players in the transition to cleaner energy solutions," he said. "These efforts are crucial for shaping a more sustainable LNG import landscape."

NEW GAS PATHWAYS

Beyond purchasing low-emission LNG, gas companies are exploring e-methane to further reduce emissions associated with gaseous energy, Yoshida said. E-methane is produced from low-carbon hydrogen and CO_2 via electrolysis and methanation. It can utilise already accounted for CO_2 captured from industrial processes or directly from the atmosphere, using direct air capture (DAC) facilities, meaning that its combustion does not lead to any net increase in CO_2 emissions.

"E-methane facilitates a smooth transition by maximising the benefits of existing natural gas infrastructure," Yoshida said. "It is fully compatible with existing infrastructure, including gas pipelines, LNG carriers, storage facilities, and gas appliances, allowing for a seamless transition from fossil fuels to renewable sources."



The government, gas companies and stakeholders are collaborating to advance commercial e-methane technologies and establish GHG accounting rules. Japan's Strategic Energy Plan stresses the importance of innovative energy technologies to enhance energy security and support decarbonisation, including by integrating e-methane into the future energy mix. This requires developing frameworks for market development, pricing, and regulatory policies, to incentivise investment in e-methane production.

At the WGC2025, Yoshida looks forward to key discussions on the evolving landscape of the natural gas industry and its transition towards greater sustainability, through innovation

The city gas industry aims to substitute 90% of Japan's city gas with e-methane by 2050, with the first cargo expected to arrive in 2030. Several commercial projects are progressing toward final investment decisions, with the first shipments of e-methane anticipated by the end of the decade. And there are many pilot projects also underway globally.

Hydrogen, ammonia and regional carbon capture and storage (CCS) are also key elements in Japan's decarbonisation strategy. Power utilities are already introducing ammonia into coal-fired power plants to cut emissions. "While hydrogen is ideal for limiting on-site emissions, the market for direct hydrogen use is still limited, requiring the establishment of hydrogen infrastructure, appliances and safety regulations," Yoshida explained.

Hydrogen can also be utilised in the form of e-methane, which allows for faster adoption of hydrogen, given that the market and infrastructure for e-methane are already in place. Meanwhile, CCS remains a cornerstone of Japan's plan to reach carbon neutrality by 2050, with multiple demonstration projects already underway and aiming to scale up to commercial use.

WGC2025 DISCUSSIONS

At the 29th World Gas Conference (WGC) in Beijing, Yoshida looks forward to key discussions on the evolving landscape of the natural gas industry and its transition towards greater sustainability, through innovation.

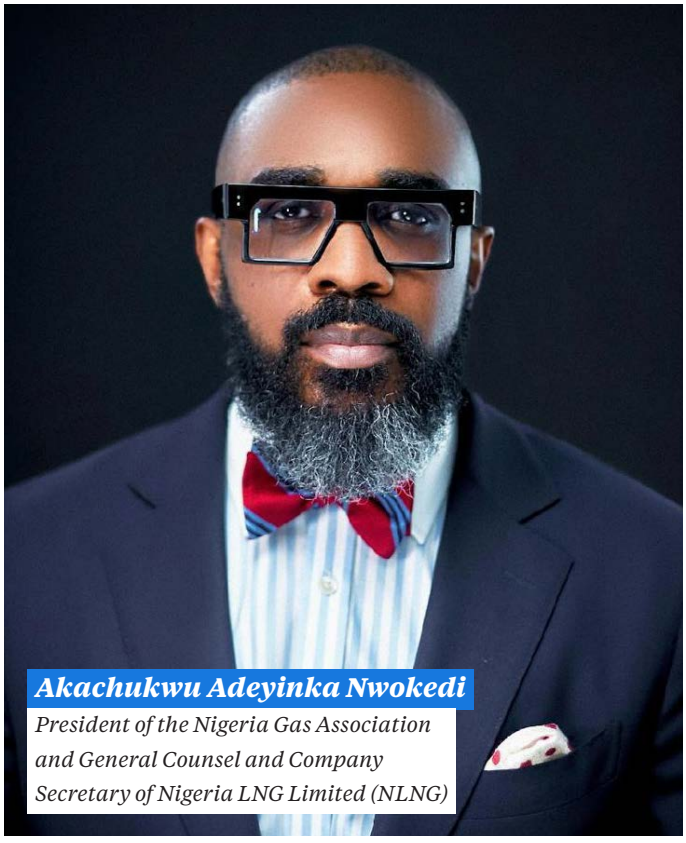
"Decarbonisation strategies will be a major focus, exploring how the natural gas sector can contribute to global decarbonisation goals, including strategies for reducing methane emissions and integrating gases such as e-methane, hydrogen and biogas into the energy mix," he said. "Market dynamics and economic trends will also be crucial topics, particularly discussions on global gas market volatility, supply chain resilience and strategies for stabilising prices amid geopolitical uncertainties."

He added that investment trends, the development of regulatory and policy frameworks, cross-border co-operation and technological innovation in the gas industry would also feature prominently at the event.

Satoshi Yoshida, Senior Adviser of the Japan Gas Association, spoke at the session "Energy and Climate Policy Shaping a Low-Carbon Energy Future," at 11:45 on May 21.

HARNESSING NIGERIA'S NATURAL GAS POTENTIAL

AKACHUKWU ADEYINKA NWOKEDI, PRESIDENT OF THE NIGERIA GAS ASSOCIATION, SPEAKS TO THE WGC2025 DAILY ABOUT NIGERIA'S PROGRESS IN REALISING THE GOALS OF ITS DECADE OF GAS INITIATIVE, EFFORTS TO EXPAND ENERGY ACCESS WITH NATURAL GAS AND REDUCE FLARING, AS WELL AS HOW AFRICAN NATIONS CAN ATTRACT INTERNATIONAL FINANCING FOR NATURAL GAS DEVELOPMENT.



Akachukwu Adeyinka Nwokedi
President of the Nigeria Gas Association and General Counsel and Company Secretary of Nigeria LNG Limited (NLNG)

WGC2025 DAILY: NIGERIA'S DECADE OF GAS INITIATIVE WAS LAUNCHED TO ACCELERATE GAS DEVELOPMENT AND ENHANCE ITS ROLE AS A DRIVER FOR ECONOMIC DEVELOPMENT. WHAT TANGIBLE PROGRESS HAS BEEN MADE SO FAR, AND WHAT HAVE THE MAIN CHALLENGES BEEN?

Akachukwu Adeyinka Nwokedi: The Decade of Gas initiative is a public private partnership launched in 2021 with the goal to transform Nigeria to a gas-based economy by 2030, and since its launch, some of the significant milestones achieved include:

- The establishment of dedicated cabinet representation at the federal level for gas with the appointment of an Honourable Minister of State, Petroleum Resources (Gas).
- Identification and enabling of 20 critical gas projects with potential to unlock an additional 4.7bn ft^3/day to the domestic market, to close the projected supply gap of 3bn ft^3/d.
- Enhanced transparency in gas price regulation and the increase of the domestic gas base price by 10%, incentivising gas supply to the power sector to facilitate its stability and continuous growth.
- Clearing over $1bn in legacy arrears to gas suppliers.
- Executive orders granting improved fiscal terms for onshore, shallow and deep-water gas projects, which directly influenced the announcement of circa $6bn worth of FIDs in 2024.

"The biggest challenge so far remains infrastructure. The critical Obiafu-Obrikom-Oben line, which had experienced technical delays, is expected to be completed in 2025."

The biggest challenge so far remains infrastructure. The critical Obiafu-Obrikom-Oben (OB3) line, which had experienced technical delays, is expected to be completed in 2025. The line will link gas assets in the eastern parts of Nigeria with major demand centres in the west and add 20% more gas to the domestic market.

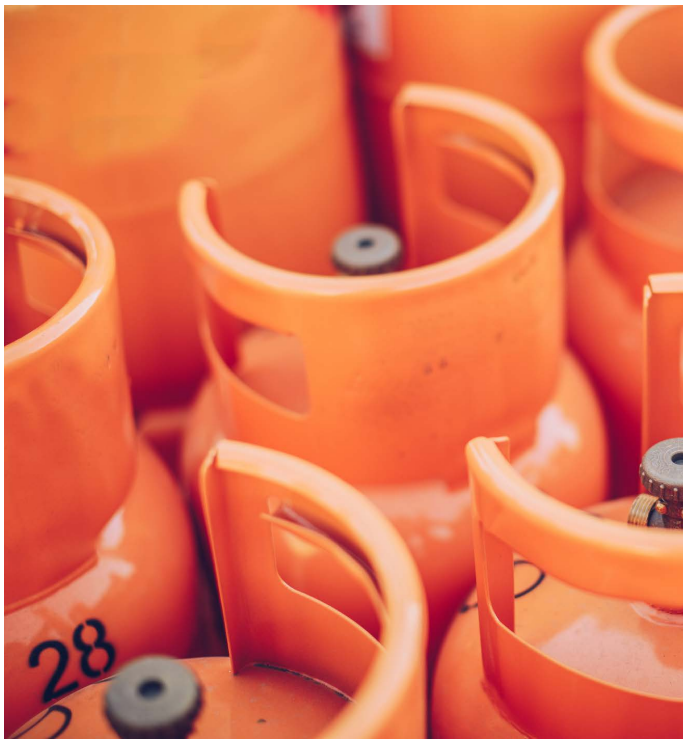
An estimated $22bn is required for full implementation of Nigeria's gas infrastructure outlook. Illiquidity and access to financing remains a significant sectoral challenge.

Supply of liquefied petroleum gas (LPG) is also a concern, which the recent Ministerial directive for the domestication of Nigeria's produced LPG volumes with a view to increasing supply and improving prices has tried to address.

Inadequate transmission and distribution infrastructure also present major obstacles to rapid development and growth within the power sector, which currently accounts for about 75% of Nigeria's domestic gas demand. Although gas-fired plants supply 80% of Nigeria's power requirements with an installed capacity of around 12-14 GW, generation and delivery is constrained to less than 5 GW due to the above-mentioned limitations. I must add that we have seen improvements in generation and delivery lately which is positive.

THE PETROLEUM INDUSTRY ACT (PIA) WAS EXPECTED TO TRANSFORM THE GAS SECTOR. HAS IT HAD THE INTENDED IMPACT, PARTICULARLY IN ATTRACTING INVESTMENT AND IMPROVING REGULATORY CLARITY?

The PIA was a huge step in the right direction for gas as it contained gas-focused provisions which was a first for Nigeria. Its delineation of upstream, midstream and downstream sectors has created the required clarity for industry operators and enhanced the industry. The commendable introduction of separate regulators for the upstream and midstream/downstream sectors has made regular stakeholder engagement necessary to identify and eliminate overlaps. In general, the PIA has delivered on its promise, bringing regulatory clarity and attracting significant investments in the upstream sectors since its passage in 2021. It is understood to be scheduled for legislative review to address some of identified shortcomings, and to keep it abreast of current geopolitical and industry trends.



WHAT PROGRESS HAS NATURAL GAS MADE IN RECENT YEARS IN EXPANDING ACCESS TO CLEANER COOKING AND TRANSPORTATION FUELS WHILE ALLEVIATING ENERGY POVERTY IN NIGERIA?

The ministerial directive on the domestication of previously exported LPG production has significantly impacted the supply and affordability of LPG in-country. NLNG pioneered the domestication of LPG production in 2007, and the recent ministerial directive is expected to continue to deepen the domestic LPG market, which has witnessed significant growth from about 50,000 tonnes/year in 2007 to about 1.5mn t/yr in 2023.

Since 2021, there has been a focus on natural gas as an automotive fuel, and the Presidential Compressed Natural Gas Initiative (PiCNG) established in 2023 has set a target of over 1mn new CNG-enabled vehicles and 55,000 CNG conversion kits for existing PMS-dependent vehicles by 2027. This has led to aggressive roll-out of CNG infrastructure in-country. A switch from the traditional automotive fuels (PMS and AGO) promises to help ordinary Nigerians absorb the shock of fuel subsidy removal, significantly reduce their energy costs, lower emissions from the automotive industry and increase domestic utilisation of Nigeria's vast gas resources.

These developments have catalysed the development of virtual pipelines conveying LPG, CNG and LNG to key markets that do not currently have pipeline infrastructure, and energy cost savings of up to 50% in some instances has brought about the revitalisation of several key industries across the country.

HOW IS NIGERIA BALANCING ITS DOMESTIC GAS UTILISATION STRATEGY WITH ITS EXPORT AMBITIONS, GIVEN THE RISE IN GLOBAL LNG DEMAND AND THE PUSH FOR ENERGY SECURITY?

In line with the PIA, the regulators implement an industry-wide domestic gas delivery obligation (DGDO) which imposes an obligation on gas producers to dedicate a percentage of produced volumes to the domestic market at regulated prices. The balance can be sold on a willing-buyer willing-seller basis to interested domestic or international off-takers. Annual DGDO obligations are calculated for all operators based on their production volumes and the projected demand in the domestic market, balancing domestic utilisation with export ambitions.

THE AJAOKUTA-KANO-KADUNA (AKK) PIPELINE AND OTHER MAJOR INFRASTRUCTURE PROJECTS ARE SEEN AS CRUCIAL FOR DOMESTIC GAS SUPPLY. WHAT IS THE CURRENT STATUS, AND ARE THERE ANY FINANCING OR REGULATORY BOTTLENECKS?

The 614 km 40" AKK and the 130 km 48/36" OB3 pipelines are two infrastructure projects critical to domestic gas supply in Nigeria. The projects are progressing steadily and stand at 75% and 98% completion respectively with no significant financing or regulatory issues given their prioritization by the Federal Government and NNPC Limited. However, the future view for major gas infrastructure is to attract public-private partnerships, which will reduce the financial burden on the government and encourage quick deployment of infrastructure to achieve its Decade of Gas aspirations.

NIGERIA HAS SIGNIFICANT FLARED GAS RESOURCES. WHAT PROGRESS HAS BEEN MADE IN CAPTURING AND COMMERCIALISING ASSOCIATED GAS THROUGH INITIATIVES LIKE THE NIGERIAN GAS FLARE COMMERCIALISATION PROGRAMME (NGFCP)?

The NGFCP is backed by law and expected to reduce flaring in Nigeria in line with the Global Gas Flaring Reduction Partnership principles for ending routine flaring globally by 2030. The Nigerian Upstream Petroleum Regulatory Commission (NUPRC) recently announced that 42 entities were deemed successful in the bid for 49 flare sites put forward during the 2022 NGFCP auction process. This NGFCP represents a significant gas monetisation opportunity and game changer for the domestic gas market.

WHAT ROLE DO PRIVATE INVESTORS AND INTERNATIONAL OIL COMPANIES (IOCS) PLAY IN NIGERIA'S GAS EXPANSION, AND WHAT POLICY SHIFTS COULD ENCOURAGE FURTHER INVESTMENTS?

Of recent, the international oil companies (IOCs) have shifted

focus to offshore assets, with attendant dilution or divestment of their erstwhile onshore interests which are in turn being acquired by private indigenous oil companies (PIOCs). Both sets of investors are critical to Nigeria's gas Decade of Gas aspirations, with the IOCs playing a greater role in upstream supply security and the PIOCs dominating investments in the midstream and downstream.

Nigeria's Decade of Gas is a driver for the necessary investment in the gas sector underpinned by policies aimed at improving the ease of doing business while encouraging greater market liberalisation, transparency, competitiveness which will attract the continued investments required to sustain the growth of the Nigerian gas industry, and by direct consequence, all the energy-dependent productive sectors of the economy.

MULTILATERAL LENDERS HAVE BEEN SHIFTING FOCUS AWAY FROM FOSSIL FUEL INVESTMENTS, INCLUDING GAS. HOW CAN NIGERIA AND OTHER AFRICAN NATIONS ATTRACT ALTERNATIVE FINANCING SOURCES TO SUSTAIN GAS DEVELOPMENT?

The increasing shift by lenders from fossil fuel investments is largely due to the ongoing transition to cleaner energy sources which has impacted the availability of funds for fossil fuel-related projects from traditional international lenders.

To attract available financing, Nigeria and other African countries must demonstrate commitment to sustainability, decarbonisation and responsible governance. The need for clear and concise national and regional energy transition plans with measurable and auditable indices and strategies to ensure compliance cannot be overemphasised.

However, the energy transition must be aligned with the developmental needs of countries in the global south to ensure it is just and equitable to all parties concerned. Nigeria and other African nations must mitigate the risks around access to financing by developing local, regional and continental financing capacity to meet their funding requirements. This will naturally come with higher costs of borrowing but may represent a more enduring solution that will guarantee a just and balanced energy transition.

There will also need to be increased openness to more unconventional financing opportunities such as private equity, blended finance and domestic capital markets to bridge the predictable gap in conventional financing for fossil fuel projects.

"For Nigeria, 2025 marks the halfway point on the Decade of Gas journey, and WGC2025 is an important platform to inform the global community on the progress to date, and the significant opportunities for investment that continue to arise."

WHY IS WGC2025 A CRUCIAL CONFERENCE FOR STAKEHOLDERS IN THE NATURAL GAS INDUSTRY, AND WHAT KEY THEMES OR DISCUSSIONS DO YOU ANTICIPATE WILL SHAPE THE GLOBAL GAS AGENDA AT THE EVENT?

For Nigeria, 2025 marks the halfway point on the Decade of Gas journey, and *WGC2025* is an important platform to inform the global community on the progress to date, and the significant opportunities for investment that continue to arise.

The impact of recent global geo-political events and the definition of the role of natural gas within the frameworks of a just energy transition, climate change and energy security are topics that will likely shape many discussions at *WGC2025*.

Furthermore, I believe that there will be robust discussions on the unique viewpoints of the global south on the role of natural gas for energy security and industrialisation.

Akachukwu Adeyinka Nwokedi is currently the President of the Nigeria Gas Association and General Counsel and Company Secretary of Nigeria LNG Limited (NLNG). He spoke at the session "Gas in Africa: Natural Gas as An Ideal Choice" at 11:45 on May 22. ■

Photo: ***The Nigeria LNG complex on Bonny Island, Nigeria***
Source: Nigeria LNG

NATURAL GAS: BACKBONE OF EGYPT'S ECONOMY

NATURAL GAS MEETS MORE THAN 60% OF EGYPT'S ENERGY NEEDS, PLAYING A KEY ROLE IN POWER GENERATION, INDUSTRY, TRANSPORTATION, COOKING, HEATING, AND DISTRICT COOLING. THE COUNTRY IS WORKING TO STRENGTHEN SUPPLY, IMPROVE EFFICIENCY, AND EXPAND ITS ROLE AS A GAS HUB TO ENHANCE ENERGY SECURITY, KHALED ABUBAKR, CHAIRMAN OF TAQA ARABIA AND THE EGYPTIAN GAS ASSOCIATION, TOLD WGC2025 DAILY.

Khaled AbuBakr
Chairman of TAQA Arabia and the Egyptian Gas Association

Natural gas has long dominated Egypt's energy mix, lowering power sector emissions by replacing imported fuel oil, driving industrial growth, expanding affordable energy access and generating revenue from LNG exports. However, fast population growth and surging energy demand in recent years have posed difficulties for the country's energy security. To address this challenge, the government is encouraging increased offshore gas development and working to enlarge the country's role as a regional gas hub, having begun receiving Israeli gas five years ago and expected to do the same in the future with Cypriot gas. This strategy should ensure natural gas remains central to Egypt's energy landscape for decades, Khaled AbuBakr, Chairman of TAQA Arabia and the Egyptian Gas Association, told *WGC2025 Daily*.

Today, natural gas supplies over 60% of Egypt's energy needs, including more than 80% of power generation. Around 85mn of the country's 115mn people rely on gas daily for power generation, cooking and heating, and it also performs many other critical roles, from serving as feedstock for petrochemicals and fertiliser production to providing stable power for energy-intensive industries, district cooling and water desalination.

"Natural gas is integral to the Egyptian economy – whether in power generation, fertilisers or other sectors," AbuBakr said. "Fertilisers, for example, support agriculture, which in turn supports food production. It is the start of the value chain for many parts of the economy."

Egypt produced 57.1bn m^3 of gas in 2023 and consumed 60bn m^3, with the shortfall covered by imports.

THE GAS STORY SO FAR

Egypt's gas industry dates back to the 1967 discovery of the Abu Madi field in the Nile Delta, followed by other major finds in the Nile Delta and in the Mediterranean. By the 1990s, gas became a central part of the energy mix, with production increasing and domestic pipeline networks expanding.

"Natural gas is integral to the Egyptian economy – whether in power generation, fertilisers or other sectors."

The shift accelerated in the 2000s, when gas overtook fuel oil as the primary fuel for power generation and industry. LNG exports began in 2005 via the 7.2mn tonne-per-year Idku and 5mn tpy Damietta terminals, creating a valuable export revenue stream. By the early 2010s, gas accounted for over half of Egypt's total energy consumption.

However, fast economic growth that followed the 2011-14 Egyptian Crisis led to supply shortages, forcing the country to curb gas consumption and halt LNG exports. Fortunately, the 2015 discovery and subsequent development of the Zohr field in the deepwater Mediterranean reversed years of production decline, restoring Egypt's gas balance and enabling LNG exports to resume.

Recognising Zohr and other new fields were not enough to meet its expanding energy needs, Egypt started importing gas from the Leviathan field via the EMG pipeline in early 2020 then additionally via Jordan in 2023. However, supply constraints and heatwaves triggered power shortages in summer 2023, worsening the following summer. LNG exports were suspended, and Egypt began importing LNG last year using FSRUs.

"Over the past four years, energy demand has surged – electricity consumption alone rose by 19% between summer 2023 and summer 2024, straining gas supply," AbuBakr said.

Population growth has driven further demand in recent years, with cities expanding to accommodate new housing and infrastructure.

RESOLVING DIFFICULTIES

Despite challenges, Egypt's gas prospects remain strong, with government and industry working to enhance energy security, AbuBakr said. Authorities are taking steps to encourage increased upstream activity to offset declines at mature fields, offering more attractive terms in the past year to major international oil companies. These efforts have yielded success, as evidenced by ExxonMobil's Nefertari-1 gas discovery in January in Egypt's underexplored western Mediterranean. ExxonMobil plans two more exploration wells in 2026.

The government has also introduced different contractual terms to encourage smaller players and service companies to develop

more marginal fields.

"We've seen a rapid government response to restore production and meet demand," AbuBakr said. "Policy shifts over the past year are delivering fast results."

WGC2025 will be a critical event for the global gas industry, AbuBakr said. The world is at a crossroads in the energy transition, and uncertainty remains over its scale, pace and economic viability.

Another key development came in February when Egypt and Cyprus signed host government agreements to transport Cypriot gas via pipeline to Egypt. Gas from Eni and TotalEnergies' Cronos field is expected to be processed at Zohr facilities and liquefied at Damietta for export to Europe. Chevron, NewMed Energy, and Shell will also send gas from the Aphrodite field to Egypt for processing and export.

The possibility of importing Cypriot gas had been under discussion for years, AbuBakr said, as part of Cairo's broader goal to become a Mediterranean energy hub, similar to its role in global trade via the Suez Canal. While initial efforts focused on Israeli gas, recent shortages accelerated progress on Cypriot imports.

"By taking a more proactive approach toward Cyprus, Egypt is expanding its role as a gas hub," AbuBakr said. "This supports domestic needs while allowing some supply to be redirected to Europe."

However, further work is needed before gas begins flowing, including feasibility studies and final investment decisions, he said. Cypriot officials expect gas from Cronos by 2026 or 2027, while NewMed Energy anticipates production at Aphrodite will start in 2031.

In the meantime, Egypt is advancing energy efficiency programmes to curb consumption while working to boost production in the medium to long term. While major fields will take years to develop, smaller fields deemed uneconomic by large firms could be brought online by smaller players within months.

Given supply uncertainty, Egypt is avoiding long-term LNG import commitments, as demand may shift in the short term. AbuBakr added that Egypt could establish an LNG bunkering hub within two years, leveraging the Suez Canal's strategic position.

A BACKBONE FOR YEARS TO COME

Natural gas will "remain the backbone of Egypt's energy sector for decades," AbuBakr said, as it provides a clean, affordable and secure energy source. It will also support Egypt's rapid expansion of solar and wind power by stabilising the grid and offsetting renewable intermittency. The government aims for renewables to account for more than 40% of the power mix by 2030, targeting 14 GW of wind and 8.5 GW of solar capacity. By 2040, wind capacity is expected to reach 40 GW, with solar rising to 25 GW.

While Egypt and other developing nations are expanding the role of gas in their economies, some international banks and other financial institutions are hesitant to finance oil and gas projects due to climate policies. While this has hindered investment in parts of sub-Saharan Africa, Egypt has not faced financing challenges, as international oil companies continue to invest, and the necessary infrastructure to support projects is already in place, AbuBakr said.

"I share the sentiment of many Africans who argue that we were not responsible for global pollution over the last century, and even today, Africa accounts for less than 3% of emissions," AbuBakr said. "Now that we have discovered natural gas – a cleaner alternative to fuel oil and coal – of course we want to use it."

Egypt's gas industry benefits from strong government support, he added.

WGC2025 will be a critical event for the global gas industry, AbuBakr said. The world is at a crossroads in the energy transition, and uncertainty remains over its scale, pace and economic viability. While the gas industry understands its role, global discussions on energy transition vary significantly, depending on economic conditions. The conference will provide a platform for structured debate on balancing energy security, affordability and transition goals, he said.

The conference's location in Beijing is also significant, he said. As one of the largest energy consumers and a key player in the shift from coal to gas, China serves as an important model. It imports gas from major suppliers like Russia, Qatar and the US, making it central to global gas trade. The event will bring together stakeholders from Southeast Asia, Australia, and other industrialised and emerging markets, representing a significant share of global energy demand.

"These discussions will be crucial in shaping the future role of natural gas in the global energy mix," AbuBakr said.

Khaled AbuBakr is Chairman & Founder of TAQA Arabia, Chairman of the Egyptian Gas Association and Regional Coordinator for the IGU. He spoke at the session "Gas in Africa: Natural Gas as An Ideal Choice" at 11:45 on May 22. ■

Damjan Krnjevic Miskovic
Director for Policy Research at ADA University's Institute for Development and Diplomacy in Baku

EUROPE OUT OF STEP AS WORLD SHIFTS TO ENERGY PRAGMATISM

GLOBALLY, THERE IS GROWING RECOGNITION THAT THE WORLD IS EXPERIENCING AN "ENERGY ADDITION" RATHER THAN "ENERGY TRANSITION" — A REALITY THAT SEEMS TO HAVE BEEN OVERLOOKED IN EUROPE, DAMJAN KRNJEVIC MISKOVIC, DIRECTOR FOR POLICY RESEARCH AT ADA UNIVERSITY'S INSTITUTE FOR DEVELOPMENT AND DIPLOMACY IN BAKU, TOLD WGC2025 DAILY.

"To keep developing, we need abundant and reliable energy sources, and gas will remain a base-load fuel for a long time — declaratory climate targets notwithstanding."

Much of the world is adopting a more pragmatic approach to energy and climate policy, but the EU remains an outlier, Damjan Krnjevic Miskovic, Director for Policy Research at ADA University's Institute for Development and Diplomacy in Baku, told *WGC2025 Daily*. By pursuing what he calls a "maximalist green agenda," Brussels risks undermining its geopolitical and economic interests by locking in higher energy costs over the long term.

Following the global energy crisis that began in 2021, many countries have shifted focus towards affordability and security, after years in which sustainability often took precedence. This shift is expected to intensify under the second Trump administration, whose "Unleashing American Energy" agenda has already seen the US withdraw from the Paris Agreement for a second time and reverse several Biden-era regulations to accelerate oil and gas development.

A former senior UN and Serbian official, Krnjevic supports a growing view among energy experts: the world is undergoing "energy addition" rather than "energy transition." As S&P Global Vice Chair Daniel Yergin recently argued in Foreign Affairs, the transition will be more difficult, expensive and complex than previously thought. The world remains far off track to reach net zero by 2050, and rapid growth in renewables is supplementing — not replacing — conventional sources like natural gas.

"Last year saw record global output from wind and solar, but also record highs for oil, gas and coal," Krnjevic said. "Yes, the share of renewables in the mix will keep rising, but that's not the only important metric. The world will continue to consume more oil and gas — and more energy overall."

While most governments recognise this trend in their policymaking, the EU does not, he said. "To keep developing, we need abundant and reliable energy sources, and gas will remain a base-load fuel for a long time — declaratory climate targets notwithstanding."

The EU's 2022 REPowerEU strategy had projected a halving of gas consumption by 2030 from 2019 levels. Although demand has already fallen significantly, this has been driven largely by high prices rather than climate policy.

Krnjevic pointed to the EU's reluctance to finance new gas projects or support long-term supply contracts as a sign of its lack of pragmatic energy planning. This contrasts with earlier support for the Southern Gas Corridor (SGC), which enabled Azeri gas to begin flowing to southeast Europe in 2020.

At the height of the energy crisis in 2022, the European Commission signed a memorandum of understanding with Azerbaijan to

"Whichever developed country or countries decide to champion the adaptation approach will have a comparative advantage over the others, especially if they produce hydrocarbons, since adaptation leaves ample room for oil and especially gas to remain a base-load fuel and thus an integral part of the global energy equation well into the future."

double SGC supplies to 20 bcm/year by 2027, aiming to offset lost Russian volumes.

"Geopolitically, this could have been a slam dunk," Krnjevic said. "But the EU didn't adapt its regulations to make financing new hydrocarbon projects feasible. It didn't direct its development banks — the EBRD and EIB — to invest in what is not even a new gas project, but a straightforward extension of an existing one, nor did it signal to commercial banks that these are necessary investments. None of that happened."

While Azerbaijan has sufficient reserves to double gas deliveries, the 2027 target still lacks the sort of European financial support that would fast-track the expansion, he said. Instead, Baku is likely to sell incremental volumes at high spot prices, as European buyers remain "constrained by ideological considerations" to sign new long-term contracts that would secure lower-cost supply. "How this is good for consumers — for European households and industry — is beyond me," he added.

Krnjevic is sceptical that the EU can quickly reform its energy policy. Although some policymakers are pushing for change, entrenched bureaucracy hinders progress, he said. Abandoning the goal of phasing out hydrocarbons by 2050 would require a major shift. The tone-deaf speech by EU Commissioner for Energy and Housing Commissioner Dan Jørgensen at the early-April Southern Gas Corridor and Green Energy Advisory Council Ministerial Meeting in Baku speaks directly to this point, he noted.

"But for most of the rest of the world, that dream is already gone," he said.

At COP29 in Baku last November — labelled the "finance COP" — developed countries pledged to triple climate finance to the developing world to $300bn/year by 2035 under the New Collective Quantified Goal on Climate Finance. The funds are intended to support both mitigation and adaptation.

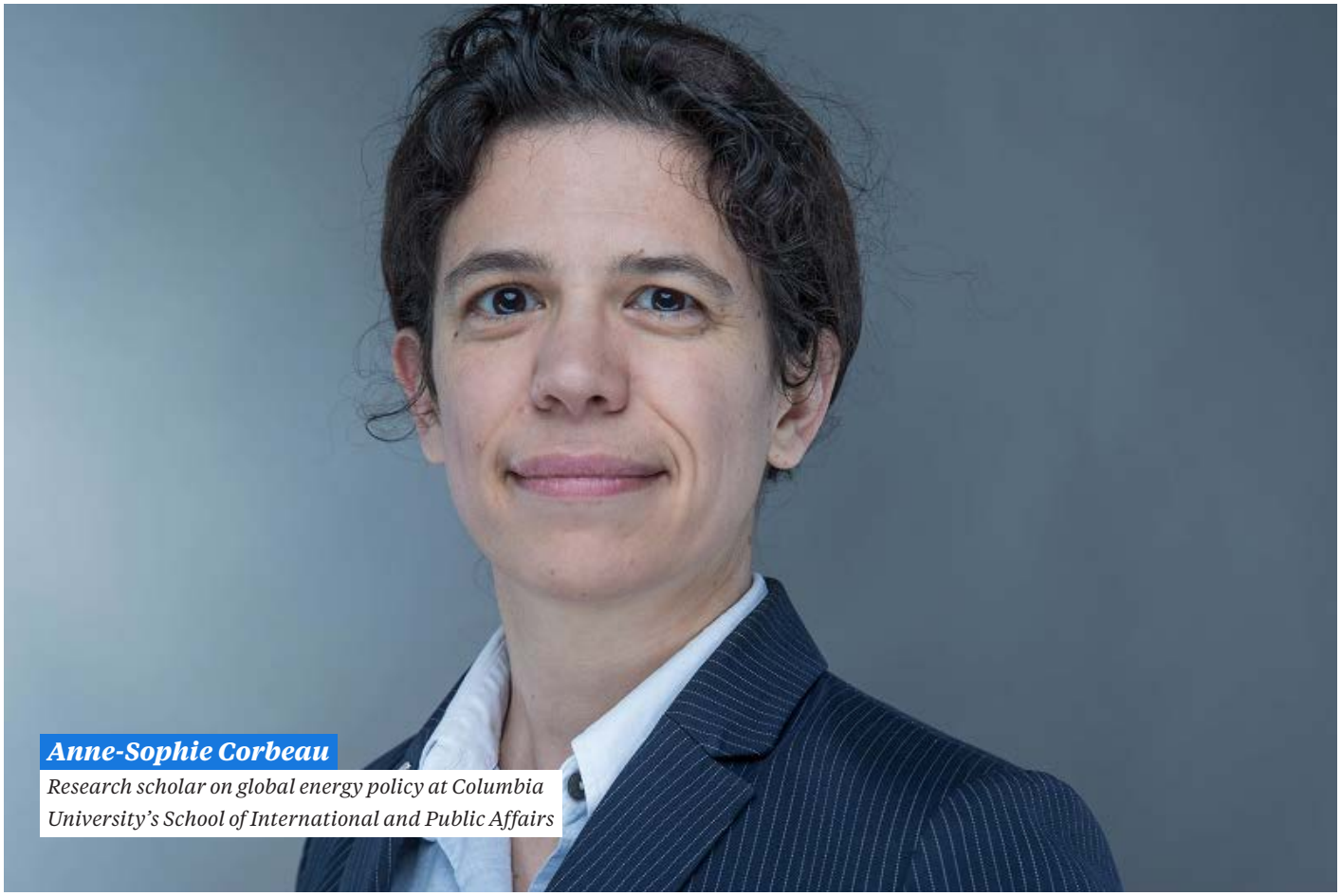
With the US now withdrawing from these commitments under Trump, questions arise over who will fund the pledge, however — a question that has become even more salient since Washington began its global tariff policy. Japan is likely to hedge its support, while Canada and other G20 countries may also scale back their contributions, Krnjevic said.

That could leave the EU and its member states shouldering the burden largely alone — at a time when it faces other financial pressures. The incoming European Commission has made re-industrialisation a central priority. A report last autumn by former ECB President Mario Draghi estimated the bloc would need an additional €800bn annually to revitalise its economy through green tech, digital transformation and defence investment. Since then, amid the conflict in Ukraine, the EU has proposed another €800bn to bolster its defence infrastructure. "Plus, they seem committed to fund the country's reconstruction," Krnjevic said.

"They don't have the money to fund all these initiatives and meet COP29 commitments without US support," Krnjevic said.

Further sapping efforts to phase out hydrocarbons, there is a growing global push to prioritise climate adaptation over mitigation, he added. While mitigation has historically received the bulk of climate finance, strong political pressure from developing countries at COP29 drove momentum for equal focus on adaptation. "Whichever developed country or countries decide to champion the adaptation approach will have a comparative advantage over the others, especially if they produce hydrocarbons, since adaptation leaves ample room for oil and especially gas to remain a base-load fuel and thus an integral part of the global energy equation well into the future," concluded Krnjevic.

Damjan Krnjevic Miskovic serves as Professor of Practice in Geopolitics at ADA University and Director for Policy Research and Analysis at its Institute for Development and Diplomacy (IDD). He moderated the session "Digitalisation and Technological Innovation to Create a Sustainable Future" at 13:45 on May 22. ■



Anne-Sophie Corbeau
Research scholar on global energy policy at Columbia University's School of International and Public Affairs

HYDROGEN: FROM HYPE TO REALITY

THE WORLD HAS OVERCOME THE HYPE ABOUT HYDROGEN, AND IS NOW GOING THROUGH THE "TROUGH OF DISILLUSIONMENT," ANNE-SOPHIE CORBEAU, GLOBAL RESEARCH SCHOLAR AT THE CENTER ON GLOBAL ENERGY POLICY AT COLUMBIA UNIVERSITY'S SCHOOL OF INTERNATIONAL AND PUBLIC AFFAIRS, TELLS THE WGC2025 DAILY. THE QUESTION IS WHETHER THE "SLOPE OF ENLIGHTENMENT" HAS BEGUN.

Photo: ***A rendering of the planned NEOM green hydrogen project in Saudi Arabia***

Source: NEOM

Perceptions of the role that hydrogen can play have evolved in recent years, amid growing awareness of the technical and economic challenges at play, Anne-Sophie Corbeau, Global Research Scholar at the Center on Global Energy Policy at Columbia University's School of International and Public Affairs, tells the *WGC2025 Daily*.

"A few years ago, some people were ready to employ hydrogen absolutely everywhere, from current applications to cars and home heating systems. Now we have become more realistic. We have moved from hype to reality," she explained. "Hydrogen is a complicated molecule, not cheap to produce and transport, prone to escape, and should be used where it makes more sense against other decarbonisation processes such as electrification."

Even in hard-to-abate industries, though hydrogen is a good solution in some areas — especially those requiring high-temperature heat, as well as in chemical manufacturing and fertiliser production — it is less suited for low and medium temperature heat where electrification offers better efficiency.

THE COST CHALLENGE

The principal challenge is cost, particularly for hydrogen produced via electrolysis using renewable power, according to Corbeau.

"Many studies are pointing to the fact that renewable hydrogen's cost is still high and is not going to drop as fast as initially expected. Therefore potential offtakers are not in a hurry to commit to buying it," she said. The impact of these costs must be assessed in terms of final consumer prices. For instance, a green steel producer may charge a premium to car manufacturers, which would, in turn, pass on a modest price increase — "a few hundreds of euros" — to the buyer of a car. "Some consumers may be ready to pay the premium," she said.

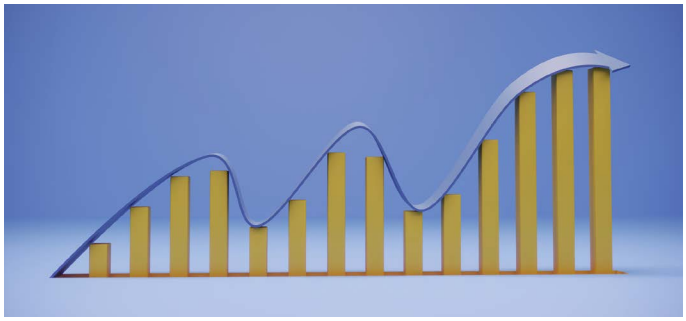
Another major complication is the timely development of systems to transport hydrogen. The lack of infrastructure, both within and between countries, is delaying project timelines and raising concerns among industrial players. "Many projects are being delayed by a few years because the infrastructure is not there and potential industry users worry about whether the hydrogen will indeed be available if there is no pipeline," Corbeau noted.

Here the state can play a key role, she said, drawing attention to Germany, which has ambitious plans to scale up its hydrogen network, backed by state support.

REGIONAL POTENTIAL

Regions with abundant solar, wind and hydro resources — as well as cheap natural gas and access to carbon capture, utilisation and storage (CCUS) — theoretically hold the most promise for clean hydrogen production. There is also growing interest in geological hydrogen, although reserves remain unproven. Yet potential does not always materialise into tangible projects. "Otherwise, a number of countries would be exporting LNG by now that aren't," she said.

According to a Hydrogen Council report published in September 2024, most hydrogen projects that have reached a final investment decision are in North America and China, with the Middle East and Europe trailing. The challenge for many projects remains securing offtakers. "This is an issue even in the US despite the generous



"What I like to ask people is whether we are before or after the bottom of the hype curve. We know we are going through the trough of disillusionment, but are we already on the slope of enlightenment. I get mixed answers. That tells me where the market is."

policy of the previous administration in terms of production tax credits: there is not so much domestic demand, but companies are interested in exporting hydrogen," she said.

POLICY SUPPORT

Hydrogen policies and roadmaps worldwide have been highly ambitious but often misaligned with achievable targets, Corbeau said. "There is no problem with being ambitious, but this becomes an issue if the targets are so high that you know this is unachievable, especially when one considers 2030 which is tomorrow in terms of the investment timeline," Corbeau said.

Many strategies issued between 2019 and 2022 were shaped by the hydrogen hype and must now be revised "asap with the updated knowledge and understanding of what can be done." She advocated for realistic targets to supplement aspirational goals, suggesting 2035 as a more appropriate planning horizon.

Initial policymaker focus was on supply, neglecting the demand side. "Now this is understood, and many policymakers are trying to find ways to help bridge the cost gap between clean hydrogen and unabated fossil fuel-based hydrogen," Corbeau said. Support mechanisms could include capital and operational expenditure assistance, contracts for difference (CfD) and carbon contracts for difference (CCfD). Other options include quotas, mandates for green products or public procurement policies favouring low-carbon goods.

Transport infrastructure remains a significant bottleneck. While Germany is actively supporting network development, as noted previously, Corbeau observed delays elsewhere due to lack of pipelines and logistical uncertainties.

Countries focusing on hydrogen exports also need to assess domestic demand. The main import markets will likely be limited to some European countries, Japan, Korea and Singapore. "China may not be importing hydrogen at all," she added.

RENEWABLE VERSUS LOW-CARBON HYDROGEN

Corbeau rejected hydrogen colour classifications, such as "green" and "blue" hydrogen, preferring to refer to them as renewable hydrogen, and low-carbon hydrogen produced from natural gas while employing carbon capture utilisation and storage (CCUS), respectively.

Has the role of low-carbon hydrogen from natural gas in developing a hydrogen market been overlooked? It depends on the country, Corbeau said.

"North America is absolutely leading in terms of low-carbon hydrogen developments, notably in the US thanks to 45Q," she said, referring to the federal tax credit for carbon sequestration. While a potential policy shift under the Trump administration remains uncertain, Corbeau believes support for CCUS is bipartisan and industry-backed, making significant changes unlikely.

In Europe, low-carbon hydrogen is still regarded as a transitional solution. "As of early March 2025, we are all waiting for the delegated act on low-carbon hydrogen in Europe," she said. Growing support from European countries and industrial players could see low-carbon hydrogen included in Renewable Energy Directive (RED III) targets.

Many countries in Africa and Latin America, as well as parts of the Middle East and China, are prioritising renewable hydrogen due to their renewable power potential.

Methane emissions from the natural gas value chain remain a critical issue for low-carbon hydrogen projects. "There will be even more scrutiny on methane emissions given its impact on the carbon intensity which is a key parameter to look at when looking at hydrogen. As I always say, we don't do hydrogen because of the colour, we do it to decarbonise," Corbeau said.

THE HYPE CYCLE

Reflecting on the market's current state, Corbeau questioned whether the sector has emerged from the "trough of disillusionment" often associated with hype cycles.

"What I like to ask people is whether we are before or after the bottom of the hype curve. We know we are going through the trough of disillusionment, but are we already on the slope of enlightenment," she said. "I get mixed answers. That tells me where the market is."

Anne-Sophie Corbeau, Global Research Scholar at the Center on Global Energy Policy at Columbia University's School of International and Public Affairs, spoke at the session Natural Gas and Renewable Gases Solutions: Best Vectors for Energy Efficiency and Energy Transition to Decarbonate Industries & Gas to Power at 15:30 on May 22. ■

Carlos Cortes Simon
Executive Chairman of the Chilean Natural Gas Association

HOW GAS SUPPORTS CHILE'S PATH TO DECARBONISATION

NATURAL GAS IS UNIQUELY POSITIONED TO SUPPORT CHILE'S ENERGY SYSTEM WHEN RENEWABLES FALL SHORT, WHILE REDUCING RELIANCE ON COAL AND DIESEL, CARLOS CORTES SIMON, EXECUTIVE CHAIRMAN OF THE CHILEAN NATURAL GAS ASSOCIATION, TELLS THE WGC2025 DAILY.

WGC2025 Daily: How does natural gas contribute to energy security, affordability and sustainability in Chile?

Carlos Cortes Simon: Natural gas plays a critical role in ensuring Chile's energy system remains reliable, affordable and resilient amid its transition toward decarbonisation. In 2024, variable renewable energy accounted for 40% of the gross generation, up significantly from previous years, but it still requires flexible thermal support to guarantee system stability — particularly during seasonal and hourly mismatches between supply and demand.

Gas-fired generation solves this issue while producing lower emissions than coal. It also contributes to affordability through competitive marginal costs and by reducing reliance on diesel when the system is under stress. Events like the nationwide blackout in February 2025 demonstrated the need for fast-reacting, firm generation sources. Natural gas is uniquely positioned to support the grid in such contingencies, delivering system services that renewables and storage alone still cannot provide on a large scale.

How could policy further unlock these benefits?

Chile's 2024 Decarbonisation Plan outlines a clear coal withdrawal strategy, but maximizing gas' contribution to a secure and low-carbon system will require more detailed regulatory alignment. Priority areas include enabling hybrid solutions (gas + storage), establishing performance-based incentives for flexible generation, and accelerating permissions for repowering and reconversion of existing assets.

Additionally, regulatory clarity on blending renewable gases — such as biomethane and green hydrogen — into the gas grid would allow the industry to contribute directly to decarbonisation. Given current market uncertainties, long-term policy stability is essential to unlock investments in gas infrastructure and ensure its continued role as a transition enabler.

How has Chile's government shored up planning for the phasing out of coal-fired generation, and what implications will this have for natural gas?

The government has committed to a full coal phase-out by 2040, with over 70% of existing capacity already scheduled for closure or reconversion by 2026. This has direct implications for the gas sector, which is expected to provide both firm capacity and fast-ramping flexibility in a system increasingly reliant on renewables.

The blackout in February, revealed the operational and communication challenges that arise when the grid is highly stressed. The post-event analysis underscored the need for robust backup capacity, geographically distributed generation, and fast system recovery protocols — all areas where natural gas has played a proven role. As

"Events like the nationwide blackout in February 2025 demonstrated the need for fast-reacting, firm generation sources. Natural gas is uniquely positioned to support the grid in such contingencies"

coal exits the system, gas will be a key tool to ensure energy security and operational continuity during both planned transitions and unforeseen disturbances.

How has gas use in the power sector evolved in the past year, and how has the mix changed in terms of domestic gas, LNG and pipeline gas from Argentina in that time?

In 2024, natural gas contributed 12 TWh to Chile's electricity generation, accounting for 14% of the annual total. Its share peaked at 23% in May and averaged 20% during Q2, reflecting its critical role during periods of lower renewable output.

The sourcing mix was balanced between LNG (56%) and pipeline gas from Argentina (44%), with LNG dominating in Q2 and Q3 and Argentine gas being more prominent in Q1 and Q4. This diversification improved supply security and reduced dependence on volatile global LNG prices. While coal generation declined by 17 percentage points between 2021 and 2024, natural gas declined by only three percentage points, underscoring its strategic resilience. Combined-cycle power plants operated with variable costs around $57/MWh, making them economically viable for flexible dispatch.

How have Chile's raising of power tariffs supported the sector and what are the implications for natural gas?

After years of suppressed rates, tariff normalisation in 2024–2025 has restored economic factors for generators and improved conditions for long-term contracting. This has been especially important for flexible technologies like gas, which rely on predictable cost recovery to remain available and to invest in performance upgrades.

However, discussions around the Electricity Subsidy Bill have raised concerns amongst stakeholders about market distortions,

financing burdens, and price stabilisation mechanisms that could impact the financial viability of both new and existing supply contracts — including gas-fired generation. Ensuring coherent and transparent policy design is key to maintaining investor confidence and unlocking gas' full potential in the evolving market structure.

What has been the recent progress on developing biogas/biomethane and clean hydrogen in Chile, in terms of policy and project development? How is/can the natural gas industry contribute to development of these renewable gases?

Chile continues to make progress in renewable gas development. The National Green Hydrogen Strategy has catalysed pilot projects in Magallanes and the Atacama Desert, while biomethane initiatives are expanding in agriculture-driven southern regions.

The natural gas industry can serve as a platform for scaling up these efforts — via the sharing of infrastructure, blending into distribution networks and facilitating early market aggregation.

"Chile's path shows how gas can support large-scale renewable integration and system security during structural transitions and real-time emergencies."

Long-term success depends on regulatory certainty around quality standards, blending thresholds and commercial frameworks. Leveraging the existing gas system can accelerate the deployment of renewable gases while ensuring reliability and cost-effectiveness.

There are concrete examples in the country that reflect the progress of renewable gases, as well as blends of natural gas with green hydrogen. Metrogas and Aguas Andinas have proven that it is possible with a project in La Farfana that is already injecting biomethane into the distribution network of Greater Santiago, supplying thousands of households. Likewise, Gasvalpo is also delivering a blend of natural gas and green hydrogen to more than 3,200 customers in La Serena and Coquimbo. These kinds of innovations are not pilot programmes — they are a glimpse into the future we aspire to build as an industry.

What discussions do you look forward to hearing about and contributing to at the WGC2025?

We are keen to engage in discussions around the evolving role of gas in systems that must remain reliable, affordable and have low-carbon emissions. Chile's path shows how gas can support large-scale renewable integration and system security during structural transitions and real-time emergencies.

Topics of particular interest include cross-border energy integration in Latin America, frameworks for renewable gas markets, and strategies to address volatility in both the physical and financial energy markets. We hope to share Chile's lessons and learn from global experiences that advance resilience and innovation in the gas sector.

Charlie Riedl
Executive Director of the Center for Liquefied Natural Gas (CLNG)

US LNG'S RISE TO DOMINANCE

THE LAST DECADE HAS SEEN THE METEORIC RISE OF US LNG, CREATING ENVIRONMENTAL AND ECONOMIC BENEFITS BOTH AT HOME AND INTERNATIONALLY. BUT THE INDUSTRY NEEDS POLICY AND REGULATORY CERTAINTY TO FULLY LEVERAGE ITS POTENTIAL, ACCORDING TO CHARLIE RIEDL, EXECUTIVE DIRECTOR OF THE CENTER FOR LIQUEFIED NATURAL GAS (CLNG).

The US has rapidly expanded its LNG exports over the past decade, leveraging its abundant and low-cost gas supply to capitalise on and fuel global gas demand growth, Charlie Riedl, executive director of the Washington-based Center for Liquefied Natural Gas (CLNG), told the *WGC2025 Daily*. At the same time, the industry's success has also been underpinned by its commitment to high environmental standards and focus on reliable and flexible supply.

In 2016, the US exported its first LNG cargo from the lower 48 states via Cheniere Energy's Sabine Pass terminal in Louisiana. Today, it is the world's largest LNG exporter, having shipped 88.3mn tonnes last year.

FIRST CARGO TO TOP EXPORTER IN UNDER A DECADE

In 2016, the US exported its first LNG cargo from the lower 48 states via Cheniere Energy's Sabine Pass terminal in Louisiana. Today, it is the world's largest LNG exporter, having shipped 88.3mn tonnes last year. With multiple new projects in the pipeline, volumes are expected to more than double by 2028, according to the US Energy Information Administration.

"The ongoing growth in the US LNG export industry is a fascinating story," Riedl said. In addition to benefiting from vast and low-cost shale gas resources — development of which has pushed overall US gas production up by more than 40% in the past seven years, US LNG has also been bolstered by a global surge in gas demand, which it played a role in accelerating.

Part of this demand has been driven by efforts to transition away from coal and other high-emission fuels, a trend similar to what occurred in the US two decades ago, Riedl said. As recently as 2000, coal accounted for more than half of US power generation; by 2024, that share had fallen to 15%, largely replaced by natural gas.

"What we saw in the US, and what we are seeing internationally now, is gas reducing emissions, improving air quality and providing reliability that supports renewable energy deployment," he said.

The success of US LNG is also linked to the sector's strong environmental track record, he added. "We likely have the highest level of transparency in regulations and reporting standards globally," Riedl said, emphasising that customers value this, along with the US's reputation as a reliable trade partner. Given the continued expansion of US LNG, he noted, "the world is signaling its desire to do even more business with the industry."

ENVIRONMENTAL FOCUS

Riedl, who has led CLNG since 2016, recalled that methane emissions were nowhere near as discussed in industry circles and in government at that time. "It wasn't even on the table," he said. Since then, however, the US gas industry has taken significant steps to monitor, report, verify and reduce methane emissions. This progress has been driven not only by tighter regulations but also on the industry's own initiative, as demonstrated by the increased use of voluntary certification programmes like MiQ, Project Canary and Equitable Origins.

"The LNG industry responds to pressure to address emissions — whether from buyers, governments or public opinion," Riedl said. "The industry is working hard and remains committed to addressing those environmental concerns, and transparency about standards has become critical for buyers."

Technological advances have also played a role, he said, pointing to the use of drones to detect methane leaks as an example. "An operator in an office in Houston can now remotely pilot a drone over thousands of miles of pipeline infrastructure to identify leaks and rapidly dispatch repair teams."

FLEXIBILITY OF SUPPLY

Flexibility remains a key advantage of US LNG, Riedl noted. This relates to the offer of various different contract types, tied to a choice of Henry Hub, JKM, TTF or other pricing mechanisms, marking a departure from previous use of oil indexation. US contracts also lack destination clauses.

"Flexibility really is what makes US LNG unique," he said.

That flexibility helped Europe secure alternative gas supplies following the loss of Russian pipeline volumes in 2022. Today, around 75–80% of US LNG exports are directed to Europe. Some of these volumes are under long-term contracts with Asian buyers, but are rerouted as needed because of the lack of destination clauses. Shifting market conditions could see more US LNG flowing to Asia in the future.

The absence of destination clauses also allows buyers with ambitious climate targets and uncertain gas needs in the future to sign 20-year contracts without the risk of being locked into unneeded cargoes, as they can resell them. Riedl noted that several European utilities are exploring this option.

THE NEED FOR CERTAINTY IN POLICY AND REGULATION

Casting a shadow on future LNG expansion, the Biden administration temporarily halted approvals for LNG exports to non-FTA countries in January 2024, citing the need for a review of the environmental and societal impacts of expanded exports. The move sparked industry criticism, with companies arguing that policy uncertainty undermined investment and buyer confidence. One of President Donald Trump's first executive orders upon taking office lifted the pause.

"We strongly advocate for regulatory certainty. Ideally, we want policies that favour LNG because of its benefits for trade, energy security, emissions reductions and job creation. But even if policies aren't favourable, we at least need predictability. It's the uncertainty that makes permitting, financing, and investment difficult."

While the halt did not impact US LNG export volumes in the short term, "it is difficult to ignore the effects it had and will continue to have," Riedl said.

Although the moratorium lasted only a year, some projects changed ownership, some companies nearly collapsed, and fewer contracts were signed due to uncertainty. "It was a significant setback for the industry and for buyers, and there is still a lot of work to be done to repair that damage internationally," he said.

The new administration has signaled support for LNG growth, pledging to cut red tape for liquefaction projects and the pipelines and fields that support them. In February, Commonwealth LNG in Louisiana became the first project to receive a conditional non-FTA export approval since the pause was lifted, marking a step toward a final investment decision (FID) later this year.

However, with the new administration only a matter of months into office, challenges persist. "The US LNG permitting process remains lengthy and costly, with potential court challenges," Riedl said.

In August 2024, for instance, the US Court of Appeals for the D. C. Circuit overturned the Federal Energy Regulatory Commission's approvals for NextDecade's Rio Grande LNG and Glenfarne's Texas LNG, both planned for the Port of Brownsville, Texas.

"We strongly advocate for regulatory certainty," Riedl said. "Ideally, we want policies that favour LNG because of its benefits for trade, energy security, emissions reductions and job creation. But even if policies aren't favourable, we at least need predictability. It's the uncertainty that makes permitting, financing, and investment difficult."

"We don't want to see large pendulum swings from one administration to the next," he added, expressing hope that Congress will codify rules that streamline permitting while maintaining strict environmental oversight.

At *WGC2025*, Riedl looks forward to discussions on how the rest of the world is responding to US policy shifts and what this means for global energy and other trade. He is also eager to hear talks on the environmental issues affecting gas, its role in the energy transition, and geopolitical factors affecting global gas flow, including whether Russian gas might return to Europe and the deepening energy ties between Russia and China.

Charlie Riedl is the Executive Director for the Center for LNG (CLNG) and Vice President of the Natural Gas Supply Association (NGSA). He spoke at the session "Balancing Supply and Demand Between Gas Importing and Exporting Countries" at 09:00 on May 23.

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