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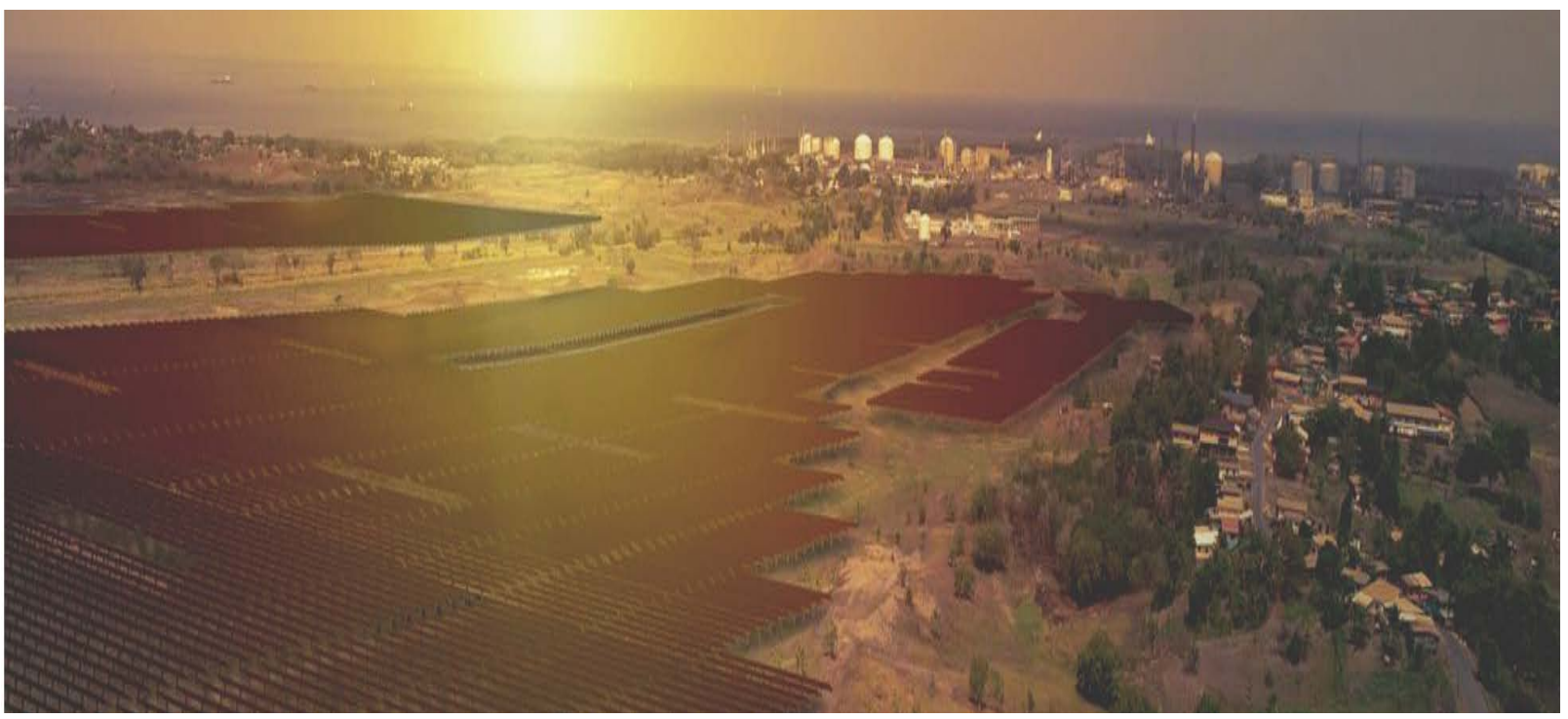
T&T committed to Project Lara construction in 2022

Trinidad & Tobago's Ministers of Energy and Planning have both reiterated the Government's full commitment to the biggest solar electricity project in the Caribbean, dubbed Project Lara, despite delays in completing the final agreements with the project shareholders. **page 3**



Project Lara (artist's impression)

BHP confirms hydrocarbons at Bongos 3 & 4 in TTDAAA 14

BHP has announced a successful outcome from their 2021 deepwater Calypso appraisal drilling campaign offshore Trinidad & Tobago.

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DeNovo's Zandolie platform complete

Trinidad and Tobago-focussed gas producer, DeNovo Energy, has announced the completion of the local fabrication of the platform.

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Advancing climate democracy in Guyana, Suriname and T&T

New policy to facilitate and support sustainable energy transitions in local energy usage is urgently needed.

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The Energy Chamber of Trinidad and Tobago Local Content Management System (LCMS)

Developed in collaboration with service and operator companies in the energy sector, the Local Content Management System is the first of its kind in the region. The LCMS provides a robust framework to estimate what proportion of the money spent to purchase goods and services remains within the national economy. The LCMS provides a system for the measurement, monitoring and reporting of local content and capacity development performance across the energy sector.

Visit www.energy.tt for more details on the LCMS

Join the following companies which have championed and signed on to use the LCMS:

Atlantic · bp · BHP · DeNovo · eog resources · METHANEX (A Responsible Care® Company) · THE NGC GROUP OF COMPANIES · PROMAN · PLNL (Point Lisas Nitrogen Limited) · Shell · YARA

T&T committed to Project Lara construction in 2022

(continued)

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Speaking at the Caribbean Sustainable Energy Conference, hosted by the Energy Chamber of Trinidad and Tobago, the Hon. Stuart Young, Minister of Energy, promised that the agreements would be "finalised, settled, signed and executed" by the end of February 2022 and the project would be up and running by 2023.

Project Lara is a joint venture comprised of multi-national energy giants bp and Shell, and specialist solar energy company Lightsource bp. The project will be constructed at two sites, one in Brechin Castle, near the Point Lisas industrial estate, and the other will be built in Orange Grove, near Trinicity. The two sites will have a combined capacity to generate a total of 112.2 MW of solar electricity, more than the total generating capacity of most islands in the Eastern Caribbean.

Nick Boyle, CEO of Lightsource bp, also spoke at the conference, where he lauded the potential that solar offers to Trinidad and Tobago. Boyle confirmed that once the project agreements were all finalised, construction will begin in 2022 and that the facility will be operational in 2023. Boyle expressed the view that there were two major benefits to solar in Trinidad and Tobago: one, the obvious role it plays in decarbonisation and participation in the energy transition, and the second that it also allowed the country to increase its natural gas sales to the petrochemical sector and increase exports of both petrochemicals and LNG.

Many speakers at the Caribbean Sustainable Energy Conference highlighted the fact that there was significant opportunity for additional solar and other renewable energy projects in the country, which has a very different energy use profile to the rest of the region given its well developed petrochemical, energy and heavy industrial sectors.

Minister Young revealed that the Ministry of Energy was already looking at the potential for floating solar projects in the sheltered waters of the Gulf of Paria and suggested that an RFP would be developed for the use of damaged quarry lands as possible locations for more of these solar projects.

Minister Young made it clear that he hopes Project Lara will be the first of many solar projects in Trinidad and Tobago. He revealed that the Ministry of Energy was already looking at the potential for floating solar projects in the sheltered waters of the Gulf of Paria and suggested that an RFP would be developed for the use of damaged quarry lands as possible locations for more of these solar projects.

The Minister of Planning, the Hon. Camille Robinson Regis, explained that Trinidad and Tobago had an existing objective of producing thirty percent of its total electricity generation from renewable sources by 2030 and that further projects would be in the pipeline. She also committed to putting in place a feed-in tariff system to allow small-scale rooftop solar projects to connect to the grid, implemented by either individual householders or businesses.

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Energy Minister announces Heads of Agreement for the restructuring of Atlantic LNG

Staff Writer | Energy Chamber

The Government of Trinidad and Tobago and the major shareholders in Atlantic have announced a significant step forward in their negotiations on the future of the 15 million metric tonnes per annum LNG facility. Trinidad & Tobago's Minister of Energy, the Honourable Stuart Young has announced that the Government, and Atlantic's LNG major shareholders, BP, Shell and the state-owned National Gas Company have executed a Heads of Agreement for the restructuring of the four train LNG facility.

This agreement comes after months of discussions and complex negotiations as the parties work towards a restructuring of Atlantic, where each of the trains has a different shareholder structure and different commercial arrangements. Industry stakeholders have told Energy Now that agreement on the restructuring of Atlantic is important to provide a route to market for Trinidad and Tobago natural gas and to ensure future investment in upstream gas production.

In addition to the agreement signed with the Government, the shareholders in Atlantic have entered into a separate Heads of Agreement in which they have committed to pursue, in good faith, discussions on the restructuring of Atlantic. China Investment Corporation (CIC) which has an equity interest in Atlantic LNG Train 1 is not actively participating in the restructuring of Atlantic but has been having discussions with shareholders and the Government.

Discussions were initiated by the Government, bp and Shell back in 2018 as part of wider discussions on the gas industry, with an agreement to explore the restructuring of the ownership and commercial arrangements for Atlantic. It was agreed that that the LNG facilities could be managed more efficiently if they were brought under the framework of a single ownership structure. According to the Government and the shareholder companies, these discussions on how to restructure the shareholding and other commercial arrangements have involved many sensitive details at a time when the global energy landscape has often been volatile.

In March 2019 the shareholders signed a letter of intent confirming that they were willing to discuss the restructuring of Atlantic. Then in February 2020 the shareholders submitted a proposal to Government to commence the negotiations on a Heads of Agreement, which was to be followed by definitive agreements. The Government and major Atlantic shareholders have now reached this milestone and agreed the Heads of Agreement.

According to the recent statement from the Minister of Energy providing an update on the negotiations, BP, Shell and NGC have now committed to continue good faith discussions on the basis of the agreed principles and to use reasonable efforts get to a Definitive Restructuring Agreement by June 30, 2022.

Government's negotiating team was led by the Honourable Stuart R. Young, M.P., Minister of Energy and Energy Industries and Minister in the Office of the Prime Minister and included Permanent Secretaries of the Ministry of Energy and Energy Industries, Mrs. Penelope Bradshaw-Niles and Mrs. Sandra Fraser, members of staff of the Ministry and support from US Attorneys White and Case LLP and technical advisers UK Consultants Poten and Partners and Gas Strategies.

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bpTT joins forces with UWI, UTT on carbon capture and storage research

Staff Writer | Energy Chamber

bpTT is aiding Trinidad and Tobago's energy transition through its support for this country's first Carbon Capture and Storage (CCS) mapping project.

bpTT has committed TT$340,000 (approx. US$50,000) to the CCS Storage Atlas project, which is jointly led by the University of the West Indies and the University of Trinidad and Tobago and seeks to map underground sites that can be used to store captured carbon dioxide. These include depleted hydrocarbon reservoirs both onshore and offshore. The project will form the foundation for assessing the feasibility of using carbon capture and storage as a solution to significantly reduce Trinidad and Tobago's carbon emissions. Apart from funding, bpTT's support for the project includes technical support and access to reservoir data.

CCS technology captures CO_2 generated from the production or processing of natural gas and safely stores it in reservoirs underground. It could play an important role in helping Trinidad and Tobago meet its global commitments aimed at reducing greenhouse gas emissions, and is complementary to the development of a blue hydrogen industry.

Recent International Panel on Climate Change (IPCC) reports have concluded that ambitious goals, far above the current commitments, are needed to meet emission reduction targets. CCS has been identified as one of the technologies that is critical to realising this objective. CCS technologies can offset the carbon footprint of fossil fuel consumption while the world transitions towards greener sources of energy.

Gas will continue to play an important role in the energy transition and CCS can help Trinidad and Tobago decarbonise its gas value chain. If we can make the energy products we export less carbon-intensive, then those products will retain or enhance their value in global energy markets. Support for the CCS Storage Atlas forms part of bpTT's initiatives aimed at helping Trinidad and Tobago transition to a low-carbon future. Globally, bp has committed to become a net zero company by 2050 or sooner. This includes reducing emissions from its operations and providing support for initiatives that will help the world get to net zero.

In Trinidad and Tobago, bp has been working to reduce emissions from its operations and is partnering with others on net zero-related initiatives. The consortium of bp, Lightsource bp and Shell is currently working with the Government to finalise agreements for Trinidad and Tobago's first utility scale solar project.

Giselle Thompson, Vice President Corporate Operations, said: "bpTT is committed to working with industry stakeholders and the government to identify pathways for Trinidad and Tobago to transition to a low carbon future and we are excited by this project. Carbon Capture and Storage can play a crucial role in helping Trinidad and Tobago to reduce carbon emissions and keeping our energy exports globally competitive."

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BHP confirms hydrocarbons at Bongos 3 & 4 in TTDAAA 14

Staff Writer | Energy Chamber

BHP recently released their Operational Review for the half year ending 31 December 2021. In this report BHP gave an update on the Calypso appraisal programme, offshore Trinidad and Tobago.

According to BHP, the Calypso appraisal drilling programme concluded on 20 December 2021. All wells encountered hydrocarbons. Bongos-3 confirmed volumes downdip of prior penetrations and Bongos-4 established volumes in a new segment. The well results are currently under evaluation and will be incorporated into the development plan.

The three blocks are located in deepwater Block TTDAAA 14. These wells targetted natural gas and were drilled during July and August 2021. Each well was drilled in a water depth exceeding 2100 m.

BHP has a 70% stake and is the operator.

In the operational review, BHP also revealed some of their activities in neighbouring Barbados. The company stated that in Barbados, a 3D seismic survey was acquired in November 2021 over a portion of the Bimshire and Carlisle Bay blocks(6). Processed data is expected to be delivered in mid-2022.

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BHP Billiton in Port of Spain (Photo: Alice Besson)

Prosafe SE: Safe Concordia chartered by bp for Cassia C platform

Staff Writer | Energy Chamber

BP Trinidad and Tobago LLC (bpTT) has chartered the *Safe Concordia* to provide gangway connected operations at Cassia C offshore Trinidad.

The firm duration of the contract shall be approx. 160 days in direct continuation of her current contract at Cassia C, estimated 24 March to 31 August 2022. In addition, bpTT has up to four weeks of options. The value of the contract firm duration is US$19.4 million.

Jesper Kragh Andresen, CEO of Prosafe, says: "The *Safe Concordia* has been providing a stable and versatile platform for gangway connected operations at Cassia C, and Prosafe is extremely pleased that bp has elected to continue its charter. The flexibility the *Safe Concordia* offers through high bed capacity, large deck space and dynamic positioning means that bp can continue to plan and execute operations in an efficient manner."

Safe Concordia is a DP2 semi-submersible ASV with 389 (461 with ALQ) beds for worldwide operations. The vessel was constructed at Keppel FELS shipyard in Singapore and delivered in March 2005 before completing an upgrade in July 2015.

Safe Concordia

Fabrication of DeNovo's Zandolie platform is now complete

Staff Writer | Energy Chamber

Trinidad and Tobago-focussed gas producer, DeNovo Energy, has announced the completion of the local fabrication of the platform for its second offshore field development, Zandolie, located in the Gulf of Paria off Trinidad's west coast.

To mark the completion of the platform fabrication, DeNovo hosted the Minister of Energy, the Honourable Stuart Young, at the Point Lisas Industrial Estate. Minister Young toured the Zandolie construction site and met with the project team.

According to a company release, the Zandolie construction is a clear statement of the company's strategic intent to continuously build and utilise capability in country. Construction was completed at the United Engineering Services Limited (UESL) local fabrication yard with zero Loss Time Incidents (LTIs) in over one hundred man-hours of work. At peak, the project employed one hundred and nineteen people.

In addition to fabricating the platform in country, the drilling campaign will be executed by a locally owned and operated rig, Well Services Rig 110.

During his visit, Minister Young was provided with an update on the project, and he was able to view the Zandolie subsea structure, situated on PLIPDECO's quayside, ahead of the sail away for offshore installation.

The Zandolie platform will be a single well, conductor-supported platform with a nameplate capacity of 40 MMSCFD. It will be totally powered by renewable energy. Modifications to the existing Iguana field infrastructure were completed in November 2021, as Zandolie will be connected to the existing Iguana infrastructure. DeNovo aims to deliver first gas from the Zandolie development within the first half of 2022.

Minister Young was joined on the tour of the construction facility by DeNovo's Managing Director, Bryan Ramsumair; PLIPDECO's President, Ernest Ashley Taylor; UESL Director, Anees Saqui; Zandolie Project Manager, Tom Blue; and Zandolie Project Services Manager, Joannah Nelson.

Following the tour, Minister Young remarked: "This is a proud moment for DeNovo and for the country. The 100% local fabrication of the Zandolie platform is further proof of the capabilities within the energy service industry to construct high quality and complex structures, and to make the necessary adaptations to reduce carbon emissions.

Zandolie Platform

Zandolie demonstrates a continued optimism within the upstream to take practical steps to advance the sustainability agenda. I look forward to the successful delivery of natural gas from the project by the middle of this year and I commend DeNovo for its efforts to align the Zandolie platform design and fabrication with the Government's low carbon and local content efforts."

Minister Young also expressed the Government of the Republic of Trinidad and Tobago's willingness to work with the company.

DeNovo's Managing Director, Bryan Ramsumair, stated: "This critical milestone in DeNovo's second field development, highlights the drive by the team to constantly improve and learn. We pushed ourselves to deliver a greener and more local platform. The result is that the Zandolie platform is a 100% local fabrication and will be 100% powered by renewable energy, which will significantly contribute to our continued efforts to minimise the carbon footprint of our operations."

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Advancing climate democracy in Guyana, Suriname and Trinidad and Tobago

Staff Writer | Energy Chamber

Given the continued growth in the world's population and its economies, the diverse industrialisation, burgeoning digital universe and development trajectories of nations, global energy demand is expected to surge by more than 50% until 2030, according to the International Energy Agency (IEA). At the same time, humanity has relied on fossil fuels as its primary source of energy during the last century—and the unsustainability of this, both from a climate as well as supply standpoint, has driven recognition of the necessity for an energy source transition, and mainstreaming of energy sustainability approaches and solutions. Our understanding of the urgency for this, both at the local level in Trinidad and Tobago and globally, has been significantly increasing in the last decade.

Along with climate unsustainability factors, the traditional energy systems in the Caribbean, which rely on imported fossil fuels or diminishing local supplies, mean a lack of energy security and lost economic opportunity, in terms of associated costs—or missed revenues for fossil fuel-producing countries. With regional conditions that offer abundant sunshine and good supplies of wind year-round, to ignore these alternate energy sources can mean missing out on the chance to improve in all of these areas. At the same time, every unit of traditional (fossil fuel) energy saved through efficiency approaches also represents a dollar-equivalent value as compared with renewable energy. New policy to facilitate and support sustainable energy transitions in local energy usage is therefore urgently needed.

Globally, governments have struggled to get the needed climate-driven policy and private-led action on the ground, despite extensive high-level fora. Furthermore, climate change terms and processes are not well understood by the majority of the general population. It is sometimes difficult for governments to bring key climate action issues to the fore due to a lack of perceived public priority. Some data, however, is very telling of the wants and needs for greater education, empowerment and policy-engagement by citizenry. In Trinidad and Tobago, surveys have indicated that 9 out of 10 persons think there is not enough public information available on climate change issues and solutions, while in Guyana and Suriname more than 50% of the population are unaware of what climate change is; and only 1 in 20 persons in Suriname can accurately describe it.

Understanding these gaps, and recognising certain unique local and regional developments in the last decade, the TT-based NGO IAMovement developed the project 'Advancing Climate Democracy in Guyana, Suriname and Trinidad & Tobago' supported by the United Nations Democracy Fund (UNDEF). The project is focussed on helping to address the shortcomings in citizen education, awareness and empowerment on climate and energy matters, together with creating a bridge between relevant stakeholders and members of the public for the necessary policy development actions—to support a more climate-environmental and economically secure future within the project countries.

An important commonality between the three (3) countries involved in the UNDEF project is that they all possess a natural resource of fossil fuel supplies—though at different stages of development; where Trinidad and Tobago is a century-old energy leader in the fossil fuel space, and Guyana and Suriname are important new players at much younger stages of development. While Trinidad and Tobago's fossil fuel resources have contributed significantly to the country's development and economic prosperity, its longstanding history in this space also means that the valuable lessons that have been learned can be shared with Guyana and Suriname, as Caribbean neighbours with their new and emerging fossil-fuel based economies.

The tri-country UNDEF Climate Democracy Project will feature two key thematic areas working together to support two intended outcomes. These are:

1) Enhanced citizen capacity to make transformational climate-smart choices; and
2) Improved citizenry influence on policy relating to climate matters

Specifically, the project will focus on citizen engagement, education and awareness on local and global climate matters—alongside the parallel development of relevant policy in each of the project countries for presentation and consideration in local

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Kenesjay Green Limited (KGL) working in partnership with Dominica to deliver a Green Hydrogen Country Assessment

Staff Writer | Energy Chamber

Kenesjay Green Limited (KGL), the owner and project developer for the proposed US$300 million NewGen Hydrogen Project in Trinidad and Tobago, is completing a Green Hydrogen Country Assessment for the Caribbean island of Dominica in conjunction with the Climate Resilience Execution Agency for Dominica (CREAD).

The assessment will focus on creating a roadmap for the utilisation of Dominica's geothermal resources to build a resilient economic future for the country, while supporting regional and global low-carbon energy transition. The results of the Country Assessment will be used to create a country profile for industrialised renewable energy developments and identification of areas requiring special attention to make this opportunity a reality. The output will guide the national green investment choices and prioritise the areas of intervention.

Philip Julien, Chairman of KGL, recently led a team as part of a site visit to Dominica as it completes its Green Hydrogen Country Assessment for the island. Also, during this visit, as a sign of their long-term interest in the country, KGL incorporated their newest subsidiary company, Kenesjay Green (Dominica) Limited. This undertaking is in keeping with KGL's mission to develop a pipeline of viable decarbonising and green projects across the Caribbean.

The work is being conducted under a Memorandum of Understanding (MoU), signed last year at COP26, in which CREAD and KGL established a working partnership to facilitate the collaborative development of Green Industrial Eco Parks (GIEP), green hydrogen production, carbon sequestration, and decarbonising industries.

Commenting on the project, Mr. Julien said, "We are pleased that the Government of Dominica, through CREAD, has accelerated Dominica's transformation possibility through the recently signed MoU and this Country Assessment. This truly epitomises for us what an effective public/private partnership can look like. Dominica's type of positive leadership and untapped green energy is what we need as a region to achieve NetZero by 2050".

Julien elaborated that "KGL is pleased to contribute from a private sector investment perspective, towards developing the viable green business case for interconnecting CARICOM's renewable energy resources".

CEO of CREAD, Ms. Francine Baron, endorsed Kenesjay Green's role in developing Dominica's resilience plans and its economic diversification agenda.

"KGL's assessment of our current and planned infrastructure has coincided with the recent approvals by the Government to develop Geothermal Based-Green Industrialisation Projects for the Commonwealth of Dominica through the Establishment of Green Industrial Parks," Ms. Baron said. "Our end goal is to develop important bankable projects that would lend itself to investments."

She further added: "Dominica has taken a lead role in regional climate change advocacy and we welcome KGL's plan to support this type of regional renewable energy advancement and integration, something that the Caribbean now has to accelerate given our individual challenges and plans for climate resilience."

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KBR Awarded Study to Support Green Hydrogen Growth in Trinidad and Tobago

Staff Writer | Energy Chamber

KBR announced that it has been awarded a study to help establish a green hydrogen market in Trinidad and Tobago as part of an ongoing technical cooperation financed by the Inter-American Development Bank (IDB).

Under the terms of the contract, KBR will analyse strategies for maximising opportunities to establish a green hydrogen economy in Trinidad and Tobago, undertaking supply and demand dynamics for green hydrogen generation, transportation and end use applications.

The study will identify opportunities for the development of a low carbon economy, with a roadmap to Net Zero through technological innovation. It will assess the potential for green hydrogen production as well as the repurposing of the existing facilities for low carbon hydrogen. The assessment will include recommendations for a technical implementation plan.

KBR will work with National Energy Corporation of Trinidad and Tobago Limited (National Energy) and other key stakeholders to identify areas for development in existing infrastructure and policy, with a focus on innovative approaches to advance sustainable growth in this sector that would help to diversify its economy.

"This study builds on KBR's proud history of supporting Trinidad and Tobago's advancing focus on clean energy solutions – establishing itself as a leader in the regional hydrogen economy," said Jay Ibrahim, President, Sustainable Technology Solutions, KBR.

"The recent COP26 Summit brought into focus the threat of climate change on island nations. The opportunity to help the country meet its carbon reduction and sustainability targets firmly aligns with KBRs commitment of driving innovative solutions to support sustainability."

For many years, KBR has been an industry leader in energy transition, offering proprietary sustainable technologies and professional services to clients to support decarbonisation. KBR has been actively involved in the hydrogen value chain as both a technology provider, an advisor and by providing differentiated project delivery solutions.

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Advancing Climate Democracy (continued)

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Parliaments, with a link being built between the two, to allow for citizen engagement and contribution to policy development efforts in a way not done before.

The project will increase public opportunities to understand, access, influence, and help develop policy to support relevant climate-conscious advancements at the country level, in the arenas of resilience and sustainable energy; through a coordinated, innovative on-and-offline campaign that will make use of digital connective technology, in parallel with civic-parliamentary working groups.

The UN Democracy Fund project focussed on Guyana, Suriname and Trinidad and Tobago was started in July 2021 and will continue until June 2023. Key Implementing Partners have been identified to work alongside IAMovement for the implementation of the project, and in Trinidad and Tobago these include the Energy Chamber of Trinidad & Tobago and the Cropper Foundation. With Implementing Partners in Guyana and Suriname still in the process of being onboarded, the project will initiate its first public and wider stakeholder engagement activities focussed on policy development and citizen education-advocacy in early 2022, with relevant updates being shared periodically within the Energy Chamber's monthly newsletters.

To keep more closely informed on the UNDEF project activities or for enquiries about direct engagement with it, you may visit, follow and subscribe to the Implementing Agency IAMovement's online resources:

www.iamovement.org

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Minister Henderson: "T&T can become a leader in geothermal drilling for the rest of the Caribbean"

Staff Writer | Energy Chamber

Dr. Vince Henderson, Minister for Planning, Economic Development, Climate Resilience, Sustainable Development, and Renewable Energy, Dominica, while speaking at the Caribbean Sustainable Energy Conference, delivered a presentation that focussed on developing geothermal resources in Dominica.

During his contribution, Minister Henderson called for greater participation from Trinidad and Tobago in the area of developing geothermal resources in the region and capitalising on the country's 100 years' experience in drilling for oil and gas.

He said, "It is too expensive to mobilise drilling rigs from all parts of the world to come to the region, making geothermal more costly. We have the expertise right around the corner."

He added, "We hope that this is an opportunity for us to develop the capacity within the region to get involved in geothermal drilling. I really hope that Trinidad and Tobago can become a leader in geothermal drilling for the rest of the Caribbean."

Dr. Thackwray Dax Driver, President and CEO of the Energy Chamber of Trinidad and Tobago, responded, "The Energy Chamber shares this vision, since there is a large cadre of drillers from Trinidad already working for international companies here and all around the world, and we need to find those transferable skills."

Dominica's ambition is to develop its geothermal resources and develop geothermal-based green industrialisation projects. At present, the Government is considering options to develop a hydrogen project.

A previous speaker in the session, Richard Sands, Business Manager, Moorhouse Drilling and Completions, compared drilling a conventional oil and gas well with drilling a geothermal well. Sands indicated that there was no material difference in well design and construction between the two types of wells. He said that equipment, technology and the skills already existed and were transferable to geothermal projects.

He also indicated that service providers would already be familiar with the types of alterations needed to drill a geothermal well based on experiences in the oil and gas sector.

Other speakers in the session included Dr. Ken Wisian, Associate Director, Environmental Division, Bureau of Economic Geology, Jackson School of Geosciences, The University of Texas at Austin; Christiaan Gischler, Lead Energy Specialist, Inter-American Development Bank (IDB); Dr. Gregory Frébourg, Chief Geologist, Thermal Energy Partners; and Bruce Cutright, CEO, GeoFrame Energy.

Geothermal energy is a renewable energy technology that makes use of the heat and water systems below the earth's surface to generate electricity. Geothermal is an attractive renewable energy technology because it leads to decarbonisation, but it is not intermittent like solar and wind and can be considered as baseload.

Dr. Ken Wisian said that there was a renewed interest in geothermal that had been driven largely by start-up companies, with their own methods of mining the heat out of the ground. He added that it was largely driven by advancements in technology in the oil and gas industry on drilling, fracturing etc., which was way ahead of conventional geothermal industry. He indicated that there was a new paradigm in exploiting geothermal resources. Because of the advancements made, geothermal projects could now be done almost anywhere.

Dr. Wisian said that there was tremendous potential in the Caribbean for geothermal power. Conventional geothermal resources, he added, were already known, but have been under-developed. The new paradigm in geothermal would be opening up areas that hitherto would have been considered uneconomic.

He added that there were also opportunities to convert depleted oil and gas fields to produce power, which were in the early stages of testing but advancing quickly.

Christiaan Gischler, Lead Energy Specialist, Inter-American Development Bank (IDB), also indicated that there were huge opportunities for geothermal in the region. He said that Latin America and the Caribbean had large untapped geothermal potential.

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Rystad: Super-sized offshore wind installations could suffer bottlenecks from 2024 as vessels remain lightweight

Staff Writer | Energy Chamber

Offshore wind turbines are growing in size as technology advances and demand for renewable energy soars, but installing them could be a headache for operators as demand will outpace the supply of capable vessels by 2024, Rystad Energy research shows. Operators will have to invest in new vessels or upgrade existing ones to install the super-sized turbines that are expected to become the norm by the end of the decade, or the pace of offshore wind installations could slow down.

Wind turbines globally, excluding China, have experienced a growth spurt in recent years, rising from an average of 3 MW in 2010 to 6.5 MW today, with the largest in operation clocking in at 10 MW. Turbines larger than 8 MW accounted for just 3% of global installations between 2010 and 2021, but that percentage is forecast to surge to 53% by 2030.

As the energy transition accelerates, demand for offshore wind turbine installation vessels worldwide, excluding China, will rocket from 11 vessel years in 2021 to almost 79 vessel years by 2030. The need for installation vessels for turbines larger than 9 MW, which was nonexistent in 2019, will grow significantly by the end of the decade and reach 62 vessel years in 2030.

"When turbines were smaller, installation could be handled by the first-generation fleet of offshore wind vessels or converted jackups from the oil and gas industry. However, as operators continue to favor larger turbines, a new generation of purpose-built vessels is required to meet demand," says Martin Lysne, Rystad Energy Rigs and Vessels Analyst.

Unable to install new and larger turbines, the first-generation installation fleet has now transitioned into maintenance and repair services for installed turbines, while operators have upgraded other vessels' cranes in order to remain competitive in the installations market.

The global picture

In Europe, Asia (excluding China) and the emerging US market, turbine sizes are ramping up towards 2025 and beyond. Europe's first commercial 10 MW turbine was installed in December 2021 at Scotland's Seagreen offshore wind farm by Cadeler's *Wind Osprey*. A total of 114 turbines are lined up for the 1.1 GW North Sea project. At the Vineyard Wind development in the US, 13 MW turbines will be installed by DEME's *Sea Installer* after its crane upgrade. Jan De Nul's newbuild *Voltaire* will debut at the Dogger Bank wind farm in the UK, installing 13 MW turbines. Cadeler is contracted to install 14 MW turbines at the Sofia wind farm in the UK, and 14 MW turbines will also be installed at the Hai Long development in Taiwan. In addition, 15 MW turbines will be installed at the EnBW He Dreiht project in Germany, while many US developments, such as Coastal Virginia and Empire Wind, are also looking to install 15 MW turbines. Despite installing one 10 MW turbine at the Xinghua Bay wind farm last year, China is expected to lag behind Europe in average turbine size up to 2030. Although China will install some larger turbines in the coming years, most installations are expected to measure between 6 MW and 8 MW.

Vessel demands

Larger turbine installations require stronger cranes on installation vessels to lift heavier materials higher, and only a handful of purpose-built vessels available worldwide can install 10 MW+ turbines. As a result, many vessels have moved from Europe to China, where lower crane capacity vessels are still in high demand. Jan De Nul's *Taillevent* was sold to China last year, and DEME's *Apollo* has also recently been renamed and reflagged to work in the Chinese market. Excluding China, demand for 12 MW+ capable installations vessels is set to increase rapidly, taking a larger share of overall demand.

Out of the current fleet of purpose-built vessels, only a handful of units can install 10 MW+ turbines, and none are currently able to install 14 MW+ turbines. This will change towards 2025 as newbuilds start to be delivered and existing vessels get crane upgrades. Fred Olsen Windcarrier, DEME and Cadeler are all planning crane upgrades, with *Bold Tern, Brave Tern, Sea Installer, Wind Osprey* and *Wind Orca* all upgrading to 1,600-tonne cranes between 2022 and 2024, with options for other vessels to be upgraded. In addition to the purpose-built vessels, some semisubmersible heavy lift vessels are being proposed for turbine installation, such as Heerema Marine Contractors' *Thialf* and *Sleipnir*. Generally considered too large and inefficient for installing the smaller turbines of the past, these vessels have instead landed work in the offshore wind industry installing substations and heavy foundations. However, as the size of turbines increases, these units will fit right into the large cranes of heavy lift vessels such as *Thialf* and *Sleipnir*. The *Thialf* will install 27 turbines – each measuring 9.5 MW – at the Arcadis Ost wind farm in the Baltic Sea in 2023, becoming the first floating vessel to install commercial wind turbines of this size. Heerema has said both the *Thialf* and *Sleipnir* are already capable of installing 15 MW+ turbines and, with some adjustments, these vessels could even install 20 MW turbines.

Vessels built early this decade are already becoming outdated as turbines grow, making owners reluctant to commit to expensive newbuilds that could be obsolete before they are profitable. The cost to manufacture an installation vessel capable of installing 14 MW+ turbines ranges from $300 million to $500 million, but owners are opting for even bigger cranes in the hope of staying competitive for longer.

A 1,500-tonne crane capacity with 150 meters lifting height is generally considered the requirement to install 14 MW+ turbines. Considering current pending orders, excluding vessels assumed to be operating solely in China, all 11 vessels are installing cranes of more than 2,000 tonnes, with some even opting for 3,000 tonnes. Owners have one eye on the future, with some already stating they will be ready for 20 MW turbines by the end of the decade.

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TTNGL's asset deepens international reach with acquisition of a natural gas liquids terminal in USA

Staff Writer | Energy Chamber

According to research firm Rystad Energy, The National Gas Company of Trinidad and Tobago Limited has announced Phoenix Park Energy Marketing's acquisition of a natural gas liquids terminal in the US.

"The acquisition serves to broaden PPGPL's world-class business portfolio, deepen participation in the NGL value chain and advance The NGC Group's thrust towards international growth. It demonstrates TTNGL's commitment to deliver value to its shareholders and strengthens the share's position and solid performance on the Trinidad and Tobago Stock Exchange (TTSE)."

These were the thoughts of The NGC Group Chairman, Mr. Conrad Enill, as he marked the acquisition of a natural gas liquids terminal in the United States by Phoenix Park Energy Marketing LLC (PPEM), a wholly owned subsidiary of NGC's subsidiary and asset base of TTNGL, Phoenix Park Gas Processors Limited (PPGPL).

Trinidad and Tobago NGL Limited (TTNGL), through its 39% ownership interest in Phoenix Park Gas Processors Limited (PPGPL), has advanced its international growth strategy. On 21 January, 2022, PPEM completed the acquisition of a natural gas liquids (NGL) terminal located in Hull, Texas, USA from Keyera Energy Inc. (KEI). The acquisition is strategically aligned to PPEM's primary business objective which focuses on the marketing of NGLs in North America.

KEI is a subsidiary of Keyera Corporation (Keyera), one of the largest midstream oil and gas operators in Canada. Keyera services oil and gas producers in Western Canada and transports natural gas liquids including propane, ethane, butane, condensate and iso-octane to markets throughout North America. The NGL terminal's prime location within the energy hub of Texas, provides PPGPL with critical access to the robust NGL markets within North America.

With this transaction, PPEM can access and aggregate LPG supply to sustain and grow its markets in Mexico, Latin America and the United States.

The development represents yet another step in expanding the footprint of PPGPL's asset base in North America, which already includes the NGL marketing assets of Twin Eagle Liquids Marketing LLC, that has proven to be a solid investment delivering significant economic returns.

It was also noted that this acquisition, which improves the global competitiveness of PPGPL, will ultimately redound to the benefit of and yield sustained returns to TTNGL shareholders.

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Woodside awards EPCIC contract to McDermott for the Scarborough Project's Floating Production Unit (FPU)

Staff Writer | Energy Chamber

After successfully completing the Front-End Engineering Design (FEED) for the Scarborough Project, McDermott International has been awarded a contract by Woodside as Operator for and on behalf of the Scarborough Joint Venture, for the engineering, procurement, construction, installation and commissioning (EPCIC) services for its Floating Production Unit (FPU) offshore Western Australia. The integrated scope also includes the design, fabrication, integration, transportation and installation of the hull and topsides.

"McDermott brings the engineering and execution expertise to deliver integrated deepwater subsea projects and offshore FPUs to the highest standards," said Samik Mukherjee, Executive Vice President and Chief Operating Officer. "After a long engagement on the project, the collaborative execution model with Woodside—from pre-FEED through to EPCIC—de-risks execution. Further, the facilities incorporate energy efficiency in design to reduce Scarborough's offshore emissions."

The topside, which will be approximately 30,000 tons, will be fabricated by McDermott's joint venture fabrication yard, Qingdao McDermott Wuchuan, in China. The project scope includes a battery energy storage system to reduce emissions on the topsides and support Woodside's net emissions reduction targets.

"McDermott will apply our long history of successful integrated project delivery for the Scarborough Project, along with our deepwater expertise and industry-leading health and safety standards to drive this incredible project to completion," said Mahesh Swaminathan, Senior Vice President, Asia Pacific.

Engineering expertise will be leveraged from McDermott's Kuala Lumpur and Gurgaon offices, with McDermott's long-established subsea team in Perth supporting transport, installation, hook up and commissioning activities.

The FPU processes natural gas, which includes gas separation, dehydration and compression as well as mono ethylene glycol regeneration and produced-water handling. Designed for a production capacity of up to 1.8 billion standard cubic feet per day, the topside will be connected to the semi-submersible hull and pre-commissioned prior to transportation and installation in a water depth of 3,100 feet (950 meters), approximately 248 miles (400 kilometers) offshore Western Australia. The FPU will be capable of being remotely operated and minimally staffed during normal production operations.

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ExxonMobil makes two discoveries offshore Guyana

Staff Writer | Energy Chamber

The Fangtooth-1 well encountered approx. 164 ft (50 m) of high-quality oil-bearing sandstone reservoirs. The well was drilled in 6,030 ft (1,838 m) of water and is located approx. 11 m (18 km) northwest of the Liza field. The Lau Lau-1 well encountered approx. 315 ft (96 m) of high-quality hydrocarbon-bearing sandstone reservoirs. The well was drilled in 4,793 ft (1,461 m) of water and is located approx. 42 m (68 km) southeast of the Liza field.

These discoveries will add to the previously announced recoverable resource estimate for the block, of 10 billion oil-equivalent barrels.

"Initial results from the Fangtooth and Lau Lau wells are a positive sign for Guyana and continue to demonstrate the potential for the country's growing oil and gas sector, ExxonMobil and our co-venturers in the Stabroek block," said Mike Cousins, Senior Vice President of Exploration and New Ventures at ExxonMobil.

"The Fangtooth discovery is a successful result of our strategy to test deeper prospectivity, and the Lau Lau discovery adds to the large inventory of development opportunities in the southeast part of the Stabroek block. Both discoveries increase our understanding of the resource, our continued confidence in the block's exploration potential, and our view that the many discoveries to date could result in up to 10 development projects."

Fangtooth was drilled by the Stena *DrillMAX*, and Lau Lau was drilled by the Noble *Don Taylor*, which are two of six drillships supporting exploration and development drilling across three blocks operated by ExxonMobil offshore Guyana.

Separately, progress continues on infrastructure for future field development. The *Liza Unity* floating production storage and offloading (FPSO) vessel is undergoing hookup and commissioning after arriving in Guyanese waters in October 2021. The *Unity* is on track to start production in the first quarter of 2022 and has a target of 220,000 barrels of oil per day at peak production.

The hull for the *Prosperity* FPSO vessel, the third project on the Stabroek block at the Payara field is complete and topside construction activities are ongoing in Singapore for planned production start-up in 2024. The Field Development Plan and Environmental Impact Assessment for the fourth potential project, Yellowtail, have been submitted for government and regulatory review.

These new projects continue to drive investment in Guyana's growing economy. More than 3,200 Guyanese are now employed in supporting project activities, and ExxonMobil and its key contractors have spent more than $540 million with more than 800 local companies since 2015.

The Stabroek block is 6.6 million acres (26,800 km²). ExxonMobil affiliate Esso Exploration and Production Guyana Limited is operator and holds 45% interest. Hess Guyana Exploration Limited holds 30% interest and CNOOC Petroleum Guyana Limited holds 25% interest.

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Frontera Energy Corporation/CGX announce discovery at KAWA-1 offshore Guyana

Staff Writer | Energy Chamber

Frontera Energy Corporation, the majority shareholder of CGX and joint venture partner of CGX, announced that the joint venture has made a discovery at the Kawa-1 well in the Corentyne Block offshore Guyana.

According to Frontera Energy, the Kawa-1 well encountered approx. 177 ft (54 m) of hydrocarbon-bearing reservoirs within Maastrichtian, Campanian and Santonian horizons based on initial evaluation of Logging While Drilling (LWD) data.

These intervals are similar in age and can be correlated using regional seismic data to recent successes in Block 58 in Suriname and Stabroek Block in Guyana. The well also encountered hydrocarbon-bearing sands in deeper strata (Coniacian or older), which will also be analysed and could become the target of future appraisal opportunities. The net pay and fluid properties of the hydrocarbons across the shallow and deep reservoirs will now be confirmed with electric wireline logging and fluid sampling, with results to be disclosed as soon as practicable.

The Kawa-1 well was drilled to a depth of 21,578 ft (6,578 m) and targetted the easternmost Campanian and Santonian channel/lobe complex on the northern section of the Corentyne block.

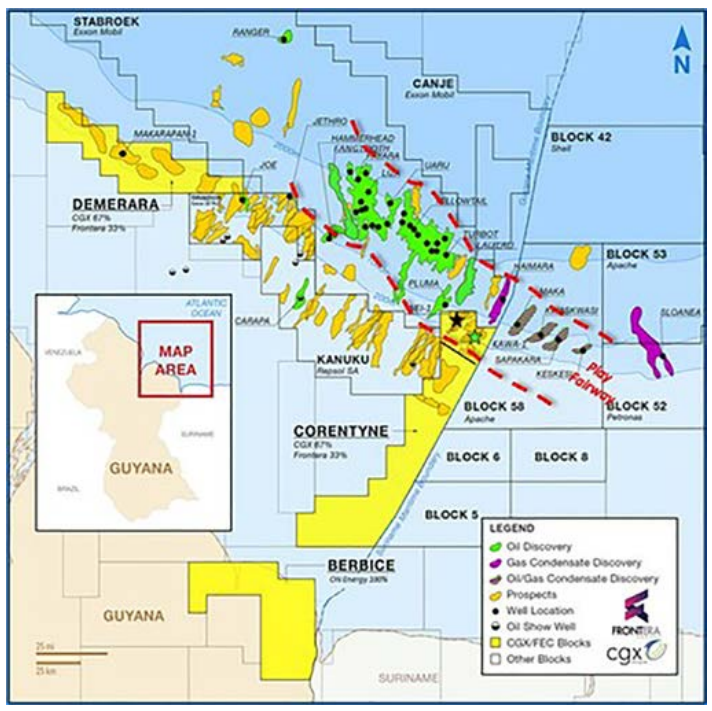
The Kawa-1 results support the joint venture's geological and geophysical models and have helped de-risk equivalent targets in other parts of the Corentyne license area. The end-of-well forecast is currently projected to be the end of February 2022. Information on final well cost estimates and additional results will be announced upon completion of end of well activities.

CGX is currently assessing several strategic opportunities to obtain additional financing to meet the costs of the drilling programme.

Gabriel de Alba, Chairman of Frontera's Board of Directors and Co-Chairman of CGX's Board of Directors, commented "Initial results from the Kawa-1 well are positive and reinforce CGX and Frontera's belief in the potentially transformational opportunity our investments and interests in Guyana present for our companies and the country. Kawa-1 results add to the growing success story unfolding in offshore Guyana as the country emerges as a global oil and gas exploration hotspot. On behalf of the joint venture, I'd like to thank the Government of Guyana for its long-standing support as we worked together to deliver this successful outcome."

Professor Suresh Narine, Executive Co-Chairman of CGX's Board of Directors, said, "Results from the Kawa-1 well represent a positive milestone in the CGX journey as a pioneer oil and gas explorer in the Guyana Basin. Together with our partner Frontera, CGX looks forward to continuing our socially and environmentally conscious approach to development of Guyana's oil and gas industry and port infrastructure. We are proud of our long partnership with the Government and People of Guyana and of our reputation as Guyana's Indigenous Oil Company."

Orlando Cabrales, Chief Executive Officer of Frontera, said "We are very pleased to have successfully drilled the Kawa-1 well with our partner CGX. I commend the significant effort of all the talented employees and contractors involved and their dedication to helping this partnership achieve this important milestone. We now have an ability to focus our efforts on potentially transformational opportunities and to continue our positive relationship with the government and people of Guyana."



Building on its recent offshore positive results at the Kawa-1 exploration well, Frontera has indicated that the joint venture anticipates spudding its second commitment well, called Wei-1, in the northwestern part of the Corentyne block in the second half of 2022.

The joint venture has exercised its option to use the Maersk Discoverer semi-submersible mobile drilling rig for the Wei-1 well. This is an important step from a health and safety, efficiency, and operational perspective and will maintain continuity in the exploration programme during a period of high demand in the region and consistency in working with a team familiar with the rig.

The Wei-1 exploration well will target Campanian and Santonian aged stacked channels in the western fan complex in the northern section of the Corentyne block. The Wei-1 well is named after one of the tallest peaks in the Pakaraima mountain range, which has commanding visibility over the surrounding terrain. Wei Tepu was historically used as a sentinel post by the Patamona People to guard against attacks.

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Tantalus acquires Congruitive to accelerate the digitisation of the electric grid acquisition

Staff Writer | Energy Chamber

Smart grid technology leader Tantalus Systems announced its acquisition of DLC Systems, Inc. d/b/a Congruitive for a purchase price that includes US$8 million of closing consideration and up to US$5 million through a two-year earn-out. Congruitive will become a wholly owned subsidiary of Tantalus' US operating subsidiary.

Congruitive is leveraging multi-decade relationships with utilities through its substation automation expertise to deliver its signature software solution, Congruence.IQ™ (C.IQ), which is a software platform that enables the interoperability of a wide range of devices through an emerging Institute of Electrical and Electronics Engineers (IEEE) standard. By deploying C.IQ, a utility's smart grid deployment can operate as one intelligent, interoperable system, with the necessary scalability and flexibility as more electric vehicles (EVs) and distributed energy resources (DERs) are deployed at the edge of the grid. Congruitive is currently selling its C.IQ software to investor-owned utilities (IOUs), smart meter vendors and renewable power integrators.

"This acquisition serves as a further demonstration of Tantalus' purpose-driven mission to help utilities become sustainable from an enhanced financial, operational and environmental perspective," said Tantalus President and CEO, Peter Londa. "Having C.IQ as part of our solution allows us to help public power and electric cooperative utilities prepare for the impact that an increasing number of EVs and roof-top solar panels will have on the reliability of their distribution grids. We are delighted to announce the closing of this acquisition today, and we welcome Congruitive's employees, customers and partners to Tantalus."

At a recent Tantalus users conference, representatives from over 100 public power and electric cooperative utilities reiterated they are under increasing pressure to maintain operations despite disruptions from extreme weather, mandates to decarbonise, and the meteoric rise of EVs, solar panels and other DERs. Despite these disruptions, utilities are called upon daily to deliver safe, reliable and affordable services, while relying on legacy distribution grids that are challenged to respond to changing dynamics. Tantalus' smart-grid platform, TUNet®, helps utilities address these challenges by enabling them to monitor, control and respond to events anywhere and at any time across their distribution networks. With the addition of Congruitive and C.IQ, Tantalus will be able to help utilities leverage data through a growing suite of software capabilities to improve the services delivered to their communities.

"This acquisition is an important milestone and will provide value to our customer base," said Congruitive CEO, Kenneth Munson. "As utilities digitise their distribution grids, providing interoperability of data from disparate devices is critical to maintaining reliable and expanded services. Tantalus' ability to access granular data and deliver next-generation analytics through TUNet coupled with our ability to transport and integrate data from distribution automation equipment and DERs will lead to an even greater range of solutions for the utility industry, and as part of Tantalus, C.IQ will have greater reach into the public power and electric cooperative utility segment."

Tantalus agreed to acquire 100% of the issued and outstanding common shares of Congruitive pursuant to the terms of a stock purchase agreement. The purchase price was comprised of US$8 million of closing consideration in the form of approximately US$3.5 million in cash, 869,565 common shares of Tantalus based on a share price of CDN$1.76 (US$1.38) (calculated with reference to the volume weighted average trading price of Tantalus' common shares on the TSX over the last five trading days ended January 28, 2022 and exchange rates over the same period) and the assumption of certain debt on Congruitive's balance sheet at the time of closing. In addition, Tantalus agreed to include an earn-out provision of up to an additional US$5 million of consideration in the form of cash and common shares of Tantalus. The earn-out is tied to Congruitive increasing its annual revenue up to US$6.9 million by 2023. Congruitive delivered approximately US$2.5 million in revenue from software and services in 2021. As part of the terms of the transaction, Congruitive shareholders agreed to a one-year lock-up for the common shares being issued by Tantalus at closing. Its current management team will remain in place and report into Tantalus' President and CEO.

"We are excited to become part of the Tantalus family," said Congruitive Founder and Chairman Douglass Campbell. "Congruitive has always been a company that cares deeply about the success of our customers. Tantalus is the right fit culturally, technologically, and operationally. Together, we look forward to helping utilities everywhere take full advantage of the data available to them, digitise the electric grid and better serve their communities in a rapidly changing world."

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NGC and Shell sign HOA to advance the Manatee Project

Staff Writer | Energy Chamber

NGC has signed a Heads of Agreement (HOA) with Shell to start the pre-Front End Engineering Design (pre-FEED) phase for the processing of Manatee gas via NGC's Beachfield Facility. The HOA sets the frame for technical and commercial work to enable further progress through this phase of the Manatee project.

The HOA strengthens the partnership between NGC and Shell and sets the stage for future collaboration between the two companies. The signing bodes well for the local energy sector as it points to yet another milestone in meeting the country's future demands for natural gas. Upon sanction, production from the Manatee area is indeed anticipated to bolster the continued gas supply to both the domestic market as well as the LNG industry.

NGC President, Mark Loquan, noted the agreement advanced NGC's strategy to secure its current business in Trinidad and Tobago. He commented, "NGC continues to collaborate with industry stakeholders and leverage the collective expertise and capabilities to sustain the energy sector. By working closely with Shell, NGC is actively participating in major growth projects that will significantly contribute to national development. The Company will work to assure the integrity and capacity of our gas-related infrastructure as we remain steadfast in our commitment to provide a steady and reliable supply of natural gas. We recognise this is an important step for the overall Manatee project. We would like to congratulate the technical and commercial teams who have worked professionally over the better part of this year to ensure there was a clear landing on this component."

NGC has strengthened its resilience in the face of a changing energy landscape and is resolute in maximising value from Trinidad and Tobago's energy resources, building a sustainable energy future.

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Successful start-up of Liza Unity: First oil produced

Staff Writer | Energy Chamber

Hess Corporation announced startup of production from the Liza Phase 2 development on the Stabroek Block offshore Guyana, utilising the *Liza Unity* floating production, storage and offloading (FPSO) vessel. The *Liza Unity* is expected to reach its production capacity of 220,000 gross barrels of oil per day later this year as operations are safely brought online.

The *Liza Unity* arrived in Guyana in October 2021, following construction in shipyards in China and Singapore. It is moored in water depth of about 1,650 meters and will be able to store approximately 2 million barrels of crude oil. The *Liza Unity* is the world's first FPSO to be awarded the SUSTAIN-1 notation by the American Bureau of Shipping (ABS) in recognition of the sustainability of its design, documentation and operational procedures.

"We are proud to be a partner in the successful development of this world class oil resource and congratulate ExxonMobil as operator for outstanding project execution," CEO John Hess said. "We look forward to continuing to work with the Government and the people of Guyana to realise the remarkable potential of the Stabroek Block for the benefit for all stakeholders. The world will need these low cost oil resources to meet future energy demand and help ensure an affordable, just and secure energy transition."

The Liza Phase 1 development, utilising the *Liza Destiny* FPSO, began production in December 2019 and this year its production capacity is expected to increase to more than 140,000 gross barrels of oil per day following production optimisation work. The third development on the block at the Payara Field, utilising the Prosperity FPSO, is on track for production startup in 2024 with a production capacity of approximately 220,000 gross barrels of oil per day. The field development plan and application for environmental authorisation have been submitted for government and regulatory review for the fourth development at Yellowtail, with a production capacity of approximately 250,000 gross barrels of oil per day and startup expected in 2025.

At least six FPSOs with a production capacity of more than 1 million gross barrels of oil per day are expected to be online on the Stabroek Block in 2027, with the potential for up to 10 FPSOs to develop the gross discovered recoverable resources currently estimated at more than 10 billion barrels of oil equivalent.

The Stabroek Block is 6.6 million acres. ExxonMobil affiliate Esso Exploration and Production Guyana Limited is operator and holds 45 percent interest in the Stabroek Block. Hess Guyana Exploration Ltd. holds 30 percent interest and CNOOC Petroleum Guyana Limited holds 25 percent interest.

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opinion

Go faster, go bolder

editorial

IF THE CARIBBEAN REGION is to address the challenge of climate change, we need to both "go faster and go bolder", to borrow from a recent statement from Ben van Beurden, the Chief Executive of Shell. We simply do not have time to waste, and it is imperative that we act now and act quickly.

The Energy Chamber is confident that the region can indeed make the bold changes that are needed and create a sustainable future for the Caribbean. The challenge is daunting, but the region has taken on big challenges in the past and has shown that this remarkable set of small nations can be world leaders. We need to be bold, and we need to act fast.

Two years ago, when the pandemic struck, everybody across society had to adapt and to do things differently; but people did indeed adapt and did so quickly.

Adapting to the challenges brought about by climate change is going to involve much bigger and more permanent adjustments.

- It involves the wholesale reorientation of the energy systems which have literally built the modern world.
- It is going to need trillions of dollars of new capital investment and new technologies and innovations that, in some cases, do not yet exist.
- It is going to need new policies, new fiscal instruments, and new relationships between the public and private sector.
- It is going to need a simultaneous focus on both mitigating greenhouse gas emissions and ensuring that we adapt to climate change and protect vulnerable people and communities, a key issue in the Caribbean, with our exposure to hurricanes and sea level rise.
- We are also going to need to focus on justice, so that the cost of change is not borne by those least able to bear the burden.

In the end, just like with the pandemic, we have no choice. The cost of inaction is just too high.

If we are to address the challenge of climate change, we simply do not have time to waste, and it is imperative that we act now and act quickly.

These are all tough and complex things to do, but at the recently concluded Caribbean Sustainable Energy Conference, we were presented with many interesting and innovative approaches to how these complex problems could be solved.

There is innovation going on in the region and there are clearly many people—in government, in the private sector, in academia and in NGOs—who are focussed on the issue of climate change, decarbonisation and the energy transition. More collaboration and sharing will certainly help, but there are plenty of good ideas and capital is available to implement many of these ideas. Financing will always be a challenge, but again there are many ideas out there to access new sources of capital from many different sources.

And in the end, just like with the pandemic, we have no choice. The cost of inaction is just too high.

The Energy Chamber of Trinidad & Tobago would like to challenge the entire Caribbean region and all sectors of society—ourselves included—to rise to the challenge posed by climate change and to grasp the opportunities that arise as we decarbonise our energy systems. We all need to commit to join in the quest to "go faster and go bolder".

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The energy transition is already here and the Caribbean needs to be on board

LAST YEAR only seven percent of new cars registered in Norway, one of the world's lead oil producers, had traditional internal combustion engines, with sixty-five percent of new cars being battery electric vehicles (EVs) and the remainder mainly plug-in hybrids. While Norway is far out in front as the leader in EV market share, the direction of travel across major motor vehicle markets is clear. Last year there were more EVs sold in the European Union than diesel cars. With roughly half of global oil production ending up as fuel for cars, it should be pretty obvious to everybody that this shift to electric-powered vehicles has serious implications to future oil demand.

The energy transition is going to take time, but it is clearly already here. It is no surprise that most major oil companies and many major oil-producing nations have had a critical rethink of their strategy over the next few decades.

Clearly the oil industry is not going to switch off overnight. As a country, however, we should not go on relying on the industry to continue to attract major investment, produce jobs, economic opportunities and significant tax revenue as it has in the past. Any prudent Government needs to put that probable scenario into its planning process. At the Energy Chamber Policy Forum in November 2021, the Trinidad and Tobago Minister of Energy confirmed that the Government was working with the end of this decade as their planning scenario for the oil industry.

Fortunately for Trinidad and Tobago, the natural gas industry probably has a longer future ahead of it, not least because of its continued importance to electricity generation and its ability to integrate well with intermittent renewable energy sources like wind and solar. The record-breaking gas prices we are currently seeing in Europe and East Asia are exactly because of this fact that gas is still crucial to balance electricity supply from intermittent renewables sources. The electrification of transport will mean that a stable electricity supply becomes even more crucial for any economy.

As the business association representing the energy sector in Trinidad and Tobago, we have put the energy transition as a central issue within our strategy. We know that we must be part of that transition, or we will soon become irrelevant. We also firmly believe that the Caribbean region is going to have a much better chance of adapting to the threat of climate change and take advantage of the opportunities that the energy transition presents, if it does so as a region. The Energy Chamber believes that regional integration and the full implementation of all aspects of the CARICOM Single Market and Economy is crucial to the region's ability to participate in the energy transition and take advantage of the opportunities that it presents.

We have been holding renewable energy and energy efficiency-focussed events in the Energy Chamber for the past decade. We started out with a final day with this focus at our annual Trinidad & Tobago Energy Conference (at the same time as we changed the name from the Petroleum Conference) and we then decided that we needed more focus and began a stand-alone conference dedicated to those issues. Interest has grown every year we have held that event; we have moved from having a handful of people in the room to over four hundred delegates in 2021. The focus has also shifted from just renewable electricity generation and energy efficiency to all aspects of decarbonisation, including carbon capture, hydrogen, sustainable transport and methane reduction.

This year we took the decision to rename the conference the *Caribbean Sustainable Energy Conference* to clearly show our interest in examining the issues on a regional basis and to look at the issues more broadly. We had a strong line-up of speakers from across the region and beyond and strong participation from a wide range of delegates. We worked with many of our partner Chambers of Commerce from the around the region through the CARICHAM network to promote the event and to share expertise and knowledge.

The energy transition is already taking place across the globe. As a region we can either decide to be part of this transition and grab the exciting opportunities that it presents or get left behind. For the Energy Chamber the choice is clear.

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Energy Chamber of Trinidad & Tobago

President and Chief Executive Officer: Dr. Thackwray 'Dax' Driver
Business inquiries: P (868) 6-ENERGY • F (868) 679-4242 . dax@energy.tt

Suite B2.03, Atlantic Plaza, Atlantic Avenue,
Point Lisas, Trinidad and Tobago

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ADVERTISING
Communications Coordinator, Energy Chamber: Michelle Ramrattan-Rahman
(868) 6-ENERGY • michelle@energy.tt

LAYOUT: Paria Publishing Co. Ltd. • www.pariapublishing.com

MEMBERSHIP ENQUIRIES
Member Relations Officer, Energy Chamber: Jodine Abhiram
(868) 6-ENERGY • member-relations@energy.tt

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Remote work or remotely working?

Professor Sterling Frost | Contributor

Should a nation embrace work from home (WFH) whose productivity and work ethic were wanting long before the COVID-19 pandemic? Many cite that WFH is more productive and lament that employers in Trinidad and Tobago (T&T) are not progressive in fully embracing this. The efficacy of WFH, however, depends on several factors including infrastructure, industry, job specification and organisational culture. Moreover, there may be hidden longer term detrimental effects of WFH that we ought to consider before throwing the baby out with the bath water. In the context of the National Development Strategy (NDS), Vision 2030, this author proffers that national culture also plays a key role in determining the optimal adoption of WFH. This article will highlight some of the research and findings around these issues while proposing a policy for T&T.

Pre-pandemic job market trends

Prior to the COVID-19 pandemic, the world was already being transformed by the fourth industrial revolution (4IR) driven by AI, big data analytics, robotics and the "internet of things"; and poised to usher in the 5IR, which reverses the trend of dehumanising innovation and emphasises human experience (HX) and mass customisation. The 4IR and 5IR necessitate re-skilling and upskilling of employees toward more technology driven and creative roles. The World Economic Forum's (WEF) 2018 future of jobs report de-emphasises the competencies of manual dexterity, memory, auditory and spatial abilities; and emphasises critical thinking, complex problem solving, emotional intelligence and creativity. Table 1 (above) further illustrates how jobs are trending.

Here, one sees the jobs that are trending downwards are repetitive in nature and/or require "clocking in" to the office. These jobs are being replaced by technology as well as, increasing technologically and financially savvy consumers require less human intervention to access products and services. As such, emerging roles are required to innovate HX by way of the aforementioned competencies. The question is—does T&T have these competencies to leapfrog into these roles?

What the pandemic has taught us

Global realities of the 4IR/5IR have been exacerbated of course by the pandemic. The pandemic has pushed existing structural deficiencies in the local labour market to its furthest limits. The silver lining is that the pandemic has allowed the world to observe the pros and cons of WFH more closely and even fast tracked required structural changes. A combination of survey reports from the Economist Intelligence Unit (EIU), shed light on these issues. One 2020 survey report, *A New World of Distributed Work* illustrates that 57% of respondents agree that the positive aspects of WFH outweigh the negative; however, the same survey finds that 43% of employees are more stressed than before indicating that improved productivity is being fueled by anxiety. Other sources point to isolation and burnout due to lack of separation of work vs home spaces. Fast forward a year later the EIU issues another survey "Reshaping Productivity", that finds that 61% of respondents find decreases or no change in productivity, i.e., less than half of WFH experiences result in greater productivity; and where there is greater productivity, there may be harmful mental effects in the long term.

Knowledge workers in the financial services sector are more poised for WFH than retail or manufacturing; however, 39% of respondents from the financial services sector have not witnessed increases in productivity. Several other factors moderate the effect of WFH on productivity, including size of company (economies of scale and specialisation); distractions at home; access to tools and information; lack of collaboration; and mental health issues.

Table 1 - Future of Jobs Survey 2018, World Economic Forum

Stable Roles	New Roles	Redundant Roles
• Managing Directors and Chief Executives • General and Operations Managers • Data Analysts and Scientists • Management and Organisation Analysts • Database and Network Professionals	• Big Data Specialists • AI & Machine Learning Specialists • Process Automation Specialists • Innovation Specialists • People and Culture Specialists	• Administrative and Executive Secretaries • Client Information and Customer Service Workers • Cashiers and Data Entry Clerks • Accountants, Bookkeepers and Payroll Clerks

The report goes on to examine issues surrounding organisational culture from two main perspectives: (1) WFH being detrimental to organisational culture, i.e. creating silos, becoming more task-oriented and reducing social interaction, all of which have implications for team-building and innovation; and (2) current organisational culture not being conducive for WFH, including attitudes towards change and technology. Other sources allude to resistance to change stemming from performance-managing WFH employees. Issues include either (1) increasing monitoring tools and technology and/or (2) a more "outcomes" based goal-setting; with the former potentially leading to a culture of surveillance and the latter being difficult to implement where the value of contributions cannot be easily proxied by outcomes. Lastly, in another EIU report *In search of lost focus*, homework 'headaches' cited include but are not limited to the temptation to "relax" (TV, video games, food) – 28%; household-related chores – 25%; need to respond to demands from others in the house – 22%; and lack of materials or tools to perform the job – 18%.

The local context and accountability

Given the above drivers for a successful WFH scenario, one should consider the following in the T&T context:

1. If 61% of respondents from a more technologically savvy pool see no improvement in productivity based on WFH, where does this leave T&T ranking at 92/141 for 'Digital skills amongst the active population' on the World Economic Forum's (WEF) 2019 Global Competitiveness index (GCI)?
2. If attitudes toward change moderate successful WFH, one needs to consider that T&T ranks 130/141 countries on the 2019 WEF GCI for 'Flexibility' in the labour market, with previous reports citing poor work ethic as the number one problematic factor of doing business. To what extent will T&T's aging workforce embrace the digital workplace, and the younger workers embrace heightened surveillance?
3. WFH requires integrity in lieu of having the appropriate monitoring and performance management mechanisms and technology. How mature is our society with respect to accountability and transparency? A recent *Newsday* article titled *Corruption major reason for pushback on technology* encapsulates our cultural readiness for WFH.
4. How equipped is T&T in dealing with mental health issues and other social issues that surround WFH?
5. Lastly, WFH is relevant to the jobs emerging in the 4IR/5IR. T&T is by and large still moving from the 3IR to the 4IR. Transitioning the workforce to these jobs requires that the workforce first has the aforementioned competencies. T&T ranks 107/141 for 'Critical thinking in teaching' on the 2019 GCI, indicating not even the future workforce may be prepared for these jobs.

Post-pandemic predictions

The experts agree that remote work and virtual meetings will be leveraged more than prior to the pandemic but less than at the peak of the pandemic, thus leading to the emergence of hybrid work arrangements. This is because in many instances, if not all, WFH pros have outweighed the cons. Unnecessary overseas travel has been reduced; the use of digital tools has been enhanced; and roles that require flexibility are able to increase output. Remote work and virtual meetings will become a stable part of the work environment and will be combined with any necessary but flexible "on-site" arrangements. The rationalising of physical spaces will be disrupted and aligned to HX values, e.g. saving employees stressful commutes and providing energising and inspiring workspaces. Increasing use of data, goal setting, KPIs and targets as well as leveraging the values of trust, transparency, and mutual agreement are required for hybrid arrangements to work. However, less enhanced economies will fall behind the efficiency curve due to lack of infrastructure and competencies to implement hybrid spaces.

Addressing WFH in the NDS

T&T is one of those countries at risk of further slipping in terms of global competitiveness. The NDS has acknowledged the risks surrounding the future of work and the labour market in three of its five Development themes. This author proposes the following policies under each of these three themes:

1. **Putting People First: Nurturing our Greatest Asset**
   a. Develop a National Competency Framework in alignment with economic diversification and hybrid work environments. Conduct a GAP analysis against this framework starting with the Public Service.
   b. Develop schemas to fill these GAPs over a strategic horizon which can include alignment of the education system; upskilling workers that are able; and transitioning workers that are not able via attrition or matching to less technically demanding positions that will eventually be phased out.
   c. Develop national WFH policies and services that protect the health and wellbeing of employees.
2. **Improving Productivity through Quality Infrastructure and Transportation**
   a. Create a distributed and affordable office schema that public and private sector organisations can subscribe to and distribute according to population density and traffic constraints.
   b. Broadband infrastructure should reach every corner of this schema.
3. **Building Globally Competitive Businesses**
   a. Provide Management Consulting and Technological support and incentives for businesses transitioning to hybrid models.
   b. Update labour laws that allow the free market more flexibility in performance managing employees and transitioning less adaptable individuals to roles that will eventually be phased out.

Already underperforming in the GCI rankings, T&T has been given a chance to play catch up with recent global disruptions. This author speculates that the vast majority of T&T's workforce has job specifications that do not align to the 4IR (see Figure 1); which then renders most jobs less efficient if done remotely. The NDS and supporting WFH policies should set clear targets for the percentage of the workforce that will align to the 4IR by 2030; working backwards to the targets for the immediate future as the world learns to live with the pandemic and global competitiveness begins to accelerate once again.

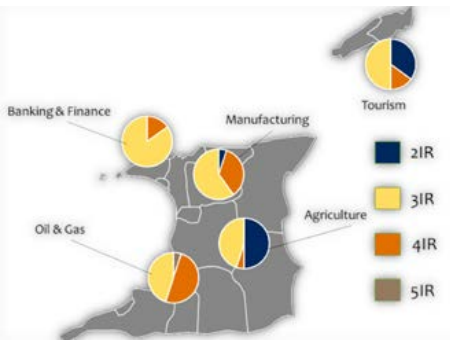

Figure 1 - Percentage of T&T workforce with job specifications compatible with WFH

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Reflections on COP26 - The NGC Group perspective

Mark Loquan | President, NGC

If one were asked to summarise the rationale for the recently concluded COP26 climate conference held in Glasgow a single word could suffice: survival. This sobering theme was common in almost every speech delivered by leaders at the event, with unanimous agreement that climate action is now, quite literally, a matter of life and death.

This is especially true for the Caribbean region. As several Caribbean leaders passionately expressed to COP26 audiences, failure to act swiftly to address climate change will have dire implications for the region. We stand on the frontline as small island developing states, facing the brunt of impact from a warming planet. We are already experiencing more severe weather events, coastal degradation, loss of wetlands and coral reefs droughts and flooding, and must brace for even worse. Rising sea levels mean saltwater intrusion into groundwater sources, impacted coastal livelihoods and destruction of the lifeblood industry of many islands, tourism.

While the writing has been on the wall for some time, many have criticised world leaders, corporations and other stakeholders for kicking the can down the road in terms of taking the aggressive action that was needed to curb runaway climate change. Promises made since Paris 2015—and even others before then—have failed to materialise, with political and business agendas often stymieing progress on emissions reduction. Due to insufficient urgency in collective global action, the discourse has moved from limiting warming to 1.5°C by 2050, to keeping the *possibility* of 1.5°C alive.

In some ways, conversations at COP26 echoed the rhetoric of years past—for example, we need to cut emissions, we need to finance clean energy and of course, we need to move past rhetoric and act now. However, there were some positive new developments that offer hope for change in the right direction, if they are carried through to their successful implementation.

USA-China collaboration

The announcement that the USA and China will collaborate on climate strategies is one of them, given the combined carbon footprint of these countries. Among the weapons of their combative efforts, will be reducing methane emissions, transition to clean energy and decarbonisation. This is good news for the Caribbean and other small island developing states, whose fates are largely in the hands of big emitters. This partnership between two global superpowers that have often diverged on policy could be a bellwether for multilateral cooperation going forward, which is critical to the climate fight.

Access to funding

Another positive for the region is the commitment to increased financing for clean energy projects in developing countries. A sticking point has always been the perceived injustice of developing nations being asked to forgo fossil fuel-based industrialisation in favour of growth led by more expensive, and in some cases still incipient, clean energy technologies.

Having access to funding that can support this type of energy transition will relieve some of the economic burden from such countries and allow them to focus on other priority development areas, including climate change adaptation strategies. For the smaller economies of the Caribbean, such financing would be a welcome boon, particularly as some are still struggling with recovery from catastrophic climate events.

In addition, since renewable energy (RE) is abundant in the region, once the overheads of RE infrastructure are covered, islands would have a degree of self-sufficiency in energy. This will give a further boost to those economies currently spending on imported oil for power.

That said, fossil fuel-based power generation is likely to be around for some time yet, given the rapid growth in energy demand and the deployment limitations of clean energy technologies. Realistically, although a decision was agreed to reduce spending on fossil fuel projects, these fuels are so entrenched in producer economies and consumer societies that the transition toward cleaner alternatives will take time. However, the balance is certainly shifting in the energy mix, particularly in the power sector, with some of the pollutant coal and oil expected to be displaced by natural gas.

As reinforced by the Gas Exporting Countries Forum (GECF) at COP26, gas can and should play a critical role in transitioning developing economies into the clean energy future and decarbonising energy production.

Another positive for the region is the commitment to increased financing for clean energy projects in developing countries. ... Having access to funding that can support this type of energy transition will relieve some of the economic burden from such countries ... For the smaller economies of the Caribbean, such financing would be a welcome boon, particularly as some are still struggling with recovery from catastrophic climate events.

Business opportunities for NGC

We at The NGC Group see a clear place for our business in the future that will be architected post-COP26. An upsurge in LNG demand will mean opportunities for small-scale and micro-LNG projects, which our teams are already exploring. Clean energy investment will take off, and market opportunities for veteran energy businesses such as our own will grow in tandem. To this latter point, many of the skills and technical requirements for clean energy technologies are transferrable from fossil fuel-based industry: project management, engineering and design, geospatial information services, module fabrication and even logistics will be just as important in a clean energy future.

We appreciate that the years ahead and Glasgow Climate Pact commitments will demand greater corporate accountability of our company. Our business is part of an industry that must take urgent and aggressive action to decarbonise operations. For The NGC Group, methane is already a front-burner issue, and we are leading the sector in terms of monitoring emissions and addressing leaks. Together with our subsidiary companies and industry partners, we are actively collaborating to make solar energy, green hydrogen and biogas a reality for Trinidad and Tobago.

Advocacy and knowledge transfer are also priorities: we are bringing learnings from the Oil and Gas Methane Partnership (OGMP) to industry forums; we are educating the public through green agenda events and technology platforms; we are supporting the efforts of light industrial consumers to increase their energy efficiency; and we are pushing for greater collaboration at the level of the Point Lisas Energy Association (PLEA) to address the industry's carbon footprint.

Reforestation

One of the notable outcomes of COP26 was a commitment by 141 countries to end deforestation, in recognition of the centrality of forests, biodiversity and sustainable land use to the achievement of the SDGs. We at NGC have adopted a 'no-net-loss' principle in our operations and implemented a project in 2005 to replant acreage cleared during pipeline construction activities. To date, our reforestation programme has restored 315 hectares in South Trinidad with native tree species, and we are now looking to expand the project and our impact in this area.

At the same time, we continue to track and report on our emissions, offsets and sustainability initiatives through our annual Sustainability Reports, the scope of which we are progressively extending. We are committed to full transparency in our business and aspire to the highest international standards in all areas of our business, including our Environmental, Social and Governance (ESG) performance.

At the end of the day, the success of COP26 lies not in the agreement signed at the close, but in the fulfilment of commitments and implementation of action items after 2021. Even the best laid plans offer no guarantees—we need to put in the work. For our part, we at The NGC Group are stepping forward, putting our hands up, and saying we are ready to bat for our country and our planet. The hope is that we are joined on the field, so that we can all have a fighting chance at a future.

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Reforestation of our country will be extremely important for future crops.

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If not now ... when?

Diana Jo-Ann Clyne | Contributor

Implementing Article 6 of the Paris Agreement will take cooperation among nations and industry. It will allow all nations to undertake climate action, not just a subset of countries. The final rules will require more complex linkages, create opportunities to export and purchase offsets, as well as connect emissions trading systems using the provisions of Articles 6.2, 6.4 and 6.8. Article 6 envisages voluntary cooperation among the global community to achieve climate goals. Of the three separate mechanisms for such cooperation that it provides, two are market-based. Under the market-based framework (Article 6.2), a country that has exceeded its climate pledge, or Nationally Determined Contribution (NDC), will be able to sell credit to a country that has fallen short of its goal. It also aims (under Article 6.4) to create an international carbon market for trading carbon credits earned anywhere in the world by any public or private body.

Trinidad and Tobago is an energy leader and we have the most to lose from inactivity. I urge us to swiftly take forward action to enhance our coherence and institutional and technical capacity building coordination, speed up our mitigation activity to minimise our greenhouse gas emissions and deepen our relationships and collaboration with other countries, relevant multilateral institutions, and global industry alike, because we have a large-scale shovel-ready carbon reduction project in place.

During November at COP26 in Glasgow, significant progress was made on setting standards, incentives, and rules for carbon markets. Carbon markets are tools—regulatory and voluntary—that cost-effectively reduce the emission of CO_2 and other greenhouse gases.

Paris Rulebook and the Mechanism

A Glasgow focus was the "Paris Rulebook". The purpose of the Paris Rulebook is to give confidence and guide investments for carbon mitigation and renewable energy projects. Investments are backed by "Corresponding Adjustments" made at the point of "Use Authorisation" of an offset export to a buyer. In other words, Corresponding Adjustments are adjustments made by a host country to its own carbon inventory to account for a credit transfer to another country. Since most businesses in the world's high-income countries are committed to a net zero target, and 196 countries are signatory to the Paris Agreement, the fossil fuel industry will be the primary source for a Paris Rulebook climate currency investment for Trinidad and Tobago.

The Paris Rulebook grandfathered the Clean Development Mechanism (CDM) under Article 6.4 into a new Mechanism. The Mechanism is so new that it doesn't even have a name, so it is just called "Mechanism". As part of the transition, the Mechanism is allowed to adopt the Methodologies of the CDM until they are replaced by methodologies developed for the Mechanism. There is a time limit for how long CDM projects and methodologies will be allowed to be utilised under the Mechanism. This "safe harbour" period is CDM project specific and 1 January 2025 deadline firm. Trinidad and Tobago registered the largest CDM project in the Caribbean in 2013 for the capture of methane in the land oilfields. This project is eligible to be grandfathered into the Mechanism if completed by 2025.

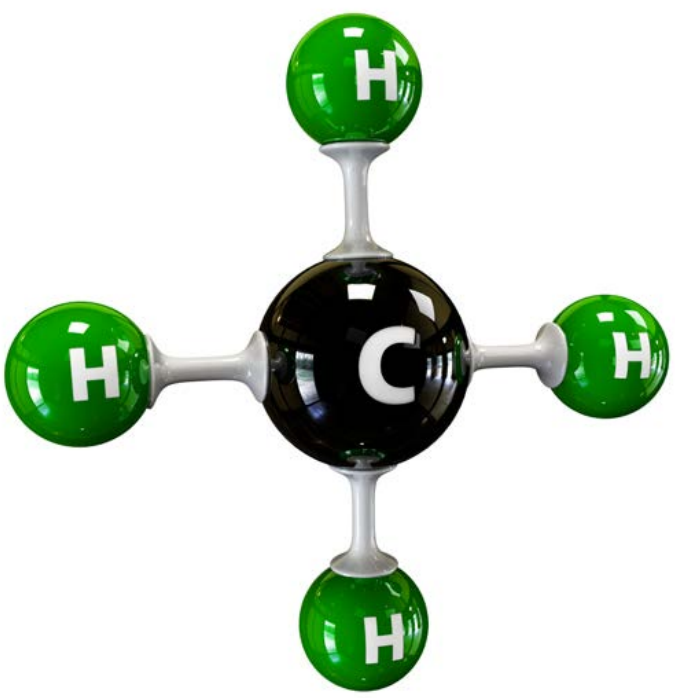
The Transition of CDM project activities from CDM into Article 6.4 must be complete by 2025. A new "Supervisory Body" for the Article 6.4 Mechanism has been given the responsibility for developing new methodologies for the Mechanism and reviewing the suitability of adopting CDM methodologies, projects, and rules into the Mechanism. The Supervisory Body will establish a registry for the Mechanism, accredit validators and emission reduction verifiers, register activities under the Mechanism and develop and approve methodologies and standardised baselines for the Mechanism. The Supervisory Body will be supported by a Secretariat, very similar to the structure and approach of the CDM. There are very few differences between the new Mechanism and the CDM.

T&T: fast-track methane capture

The Article 6.4 Mechanism will become operational much faster than country "Cooperative Approaches" under Article 6.2. It will have the Mechanism Registry in place faster than the International Registry, and the Article 6 Database. No loll off. Make haste while de sun shine. What yuh pass in de day yuh musn't take flambeau tuh look for in de night. Trinidad and Tobago should fast-track methane capture in the land oilfields and approve national legislation to implement the Paris Rulebook frameworks IMMEDIATELY, to enable us to be better positioned to meet both the Article 6.2 and Article 6.4 Participation Requirements. To participate in a Cooperative Approach, countries must meet common Participation Requirements. The most relevant part of Article 6.2 Participation Requirements is that the country must be a party to the Paris Agreement. As such, it allows host countries to tap into financing opportunities in the voluntary markets or the Article 6 markets, but recognising that for the latter, it will come with the additional cost of a Corresponding Adjustment.

No loll off. Make haste while de sun shine. What yuh pass in de day yuh musn't take flambeau tuh look for in de night. Trinidad and Tobago should fast-track methane capture in the land oilfields and approve national legislation to implement the Paris Rulebook frameworks IMMEDIATELY, to enable us to be better positioned to meet both the Article 6.2 and Article 6.4 Participation Requirements.

A key difference of the Cooperative Approach under Article 6.2 and the Mechanism under Article 6.4 are that government-to-government level arrangements must be agreed BEFORE a Cooperative Approach can come into force, but not so for the Mechanism. Once a Mechanism activity is identified by a host country, public or private entities can design projects and register them under the Mechanism. Such project activities may involve reducing emissions, increasing removals and mitigation of co-benefits of adaptation actions, and/or economic diversification plans. Article 6.4 guidelines do not make the Use Authorisation obligatory on the host country. This leaves the host country with discretion as to whether it wishes to benefit from the Mechanism or have Article 6.4 used for either domestic purposes or whether it wishes to sell a carbon unit without having to make a Corresponding Adjustment.



Methane molecule (CH_4) (Open University www.ounews.co)

The two Article 6 market mechanisms have different types of carbon units. The carbon units generated under Cooperative Approaches are called internationally transferred mitigation outcomes (ITMOs) and those generated under Article 6.4 are for the moment and all intents and purposes, CDM carbon offsets. ITMOs are not limited to just emission reductions and could include other types of units, such as renewable energy credits and the carbon, capture, utilisation and sequester tax credits available in the United States. A host country must apply a corresponding adjustment for an ITMO under a Cooperative Approach or an internationally transferred Article 6.4 emission reduction, regardless of whether that activity sits within the country's NDC. Applying a Corresponding Adjustment, regardless of whether the ITMO or Article 6.4 emission reduction arises inside or outside an NDC, means that a host country has little reason now to keep costly abatement sectors outside its NDC. Therefore, the type of activity should not force a country to choose between approving the activity under the Mechanism or a Cooperative Approach, since the mitigation outcome can be reflected either in the form of an Article 6.4 exchange or an ITMO.

Carbon clubs

The administrative burdens of Cooperative Approach and its transparency reporting to prevent double counting, will encourage the use of Carbon Clubs. Carbon Clubs are a European Union (EU) concept. The EU is in the process of lobbying other countries like the United States, Japan, the United Kingdom, Australia, and China to utilise Carbon Clubs for Article 6.2 and 6.4 exchanges. The EU believes Clubs will help avoid trade friction linked to green tariffs and carbon border levies planned by the aforementioned group of developed countries. Nonmember Club countries will be subjected to a tax on products they export to Club members, incentivising them to join Clubs and agree on Club terms, rules and principles. Carbon Club membership may be the only way for Trinidad to avoid carbon border levies. The CDM project is an easy-to-abate project and will allow Trinidad and Tobago to roll into a Carbon Club. A Carbon Club with the United States.

Take in front before in front take we. Timely discussions with the United States for an Article 6 bilateral agreement and Carbon Club participation is judicious and will jumpstart the Trinidad shovel-ready land oilfield methane abatement CDM project. Although outside Trinidad's NDC commitment, the CDM project invites financing via Article 6.4 exchanges and the facility to secure a Carbon Club membership. 2025 is a hard deadline for managing methane emissions in the Trinidad land oilfields utilising CDM. This CDM safe harbour deadline is a scant 3 years away, barely enough time to deploy and verify a USD 250 Million, 40mmscf, CH4 reduction Project, even if the green light is given by government early next year.

When yuh have cocoa in de sun, look out for rain. The CDM Project must be one of government's foremost priorities. The Government of Trinidad and Tobago has reported widely on its campaign to track and reduce methane output from fossil fuel operations through satellite monitoring, infrared visualisation and global collaboration. Cabinet appointed a special Steering Committee in February of 2021 and charged it to reduce methane emissions. This Committee can manage the implementation of the CDM Project, and the international relationships needed to full fund it, for Heritage Petroleum's onshore oilfields. The CDM Project has been on the government shelf for nine years. It is time to deploy it. There will never be a better time to deploy it. If not now ... when?

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IETA welcomes Glasgow Climate Pact

Staff Writer | Energy Chamber

World leaders recently adopted the *Glasgow Climate Pact*, a package of decisions at COP26 in Glasgow that includes completion of the carbon market elements of the Paris Rulebook. The guidance for Article 6 sets up a new structure for carbon markets to work in the service of the Paris Agreement goals.

The decisions provide clear accounting guidance for emissions trades between countries, and launch a new crediting mechanism that will give market access to all countries interested in attracting green investment through the global carbon market. Other forms of non-market approaches are also encouraged, with the creation of a new Glasgow Committee on Non-Market Approaches to begin work in 2022.

"This is a solid and ambitious outcome, because it establishes an integrity framework to support the expansion of carbon markets to help governments and businesses deliver higher climate ambitions," says Dirk Forrister, IETA CEO. "It will now be up to the private sector to channel green investment using these new market structures and accelerate the race to net zero."

On the key political issues on Article 6, negotiators made a series of compromises:

- Corresponding adjustments will ensure no double-counting of units in both Article 6.2 and Article 6.4 mechanisms. IETA supports this decision because it assures integrity in the accounting system for the markets and mechanisms advanced in Article 6.
- Certified Emission Reductions produced between 2013–20 may be used against countries' first Nationally Determined Contributions. While this may not be the most ambitious outcome, it allows the carryover of a limited supply of pre-2020 units. IETA believes this will maintain the flow of finance to developing nations until the new mechanism is up and running.
- To assure an overall mitigation in global emissions from the Article 6.4 mechanism, a 2% discount will be cancelled from issuances from that mechanism. However, this factor was not applied to Article 6.2 market linkages.
- On the Share of Proceeds (SoP) for adaptation, negotiators agreed on a rate of 5% to be taken from issuances in the new Article 6.4 emissions crediting programme, but no fixed rate will apply to Article 6.2 transactions. Instead, countries using Article 6.2 are encouraged to contribute voluntarily to the Adaptation Fund.

IETA congratulated the UK Presidency and the Article 6 negotiators for such a significant success in Glasgow. In the lead-up to COP26, carbon markets surged in many jurisdictions, as businesses contemplated the enhanced ambitions of many countries. This included growth in every carbon market in 2021, with a near doubling of voluntary market transactions and the launch of China's national ETS. Markets in Europe, California, Quebec, New Zealand, Australia and RGGI have seen record prices in the past month.

"Now we're committed to build on the success of Glasgow," says Andrea Bonzanni, IETA's International Policy Director. "We look forward to working with countries to develop national strategies and policy frameworks for how to use Article 6 to further their climate ambitions – and to make new carbon market systems grow even stronger in pursuit of the Paris goals."

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Carbon prices now apply to over a fifth of global greenhouse gases

Staff Writer | Energy Chamber

A total of 64 carbon pricing instruments are now in operation around the world, covering over 20% of global greenhouse gas emissions and generating $53 billion in revenue. According to the recent World Bank's annual "State and Trends of Carbon Pricing" report, these advances represent a 17% increase in revenue from last year, However, the full potential of carbon pricing remains largely untapped.

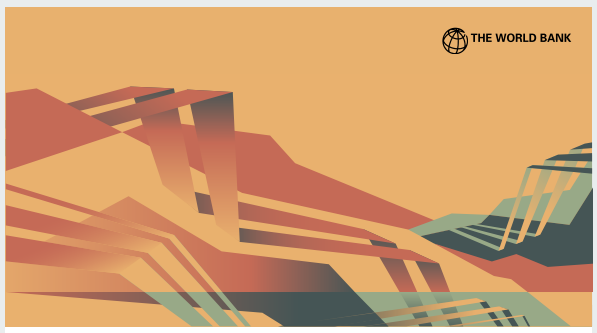
Revenue growth is driven mainly by the rise in EU allowance prices—a programme that caps emissions, requiring countries that exceed these limits to purchase additional allowances. Emissions-trading systems have been also largely resilient to reduced economic activity during the COVID-19 pandemic, and likely helped by their price or supply adjustment mechanisms.

"It is encouraging to see how governments and companies are integrating carbon pricing into their climate strategies," said Bernice Van Bronkhorst, Global Director for Climate Change at the World Bank. "But the potential of carbon pricing is still largely untapped, despite the fact that it can be effective in driving decarbonisation for countries in all stages of development. If implemented carefully, these policies can also be redirected to support lower income communities, getting resources to those who need them the most."

Key highlights in the report include the operational launch of China's national Emissions Trading System (ETS) in January 2021 and the upcoming changes to the EU ETS as part of the European Green Deal recovery package.

The report also finds that the majority of carbon prices remain far below the $40-80/tCO$_2$e range recommended for 2020 to meet the 'well below 2°C' temperature goal of the Paris Agreement. At this point, carbon prices in the recommended range cover less than 5% of global emissions.

The report was launched at Innovate4Climate, the World Bank Group's flagship annual event on climate finance, investment, and markets, held virtually this year from May 25 to 27. Now in its fifth year, the conference will bring together leaders from government, business, policy, and finance to discuss innovative climate finance solutions.



Download the full Report here:
https://openknowledge.worldbank.org/handle/10986/35620

State and Trends of Carbon Pricing 2021 calculates greenhouse gas emissions covered by implemented pricing mechanisms only, a change from previous editions of the report, which based calculations on instruments in operation and those scheduled for implementation. In the period covered by the report, the following are the new carbon pricing instruments from the previous year: China ETS, UK ETS, Germany ETS, Netherlands Carbon Tax, Luxembourg Carbon Tax and the Tamaulipas and Baja California subnational Carbon Taxes.

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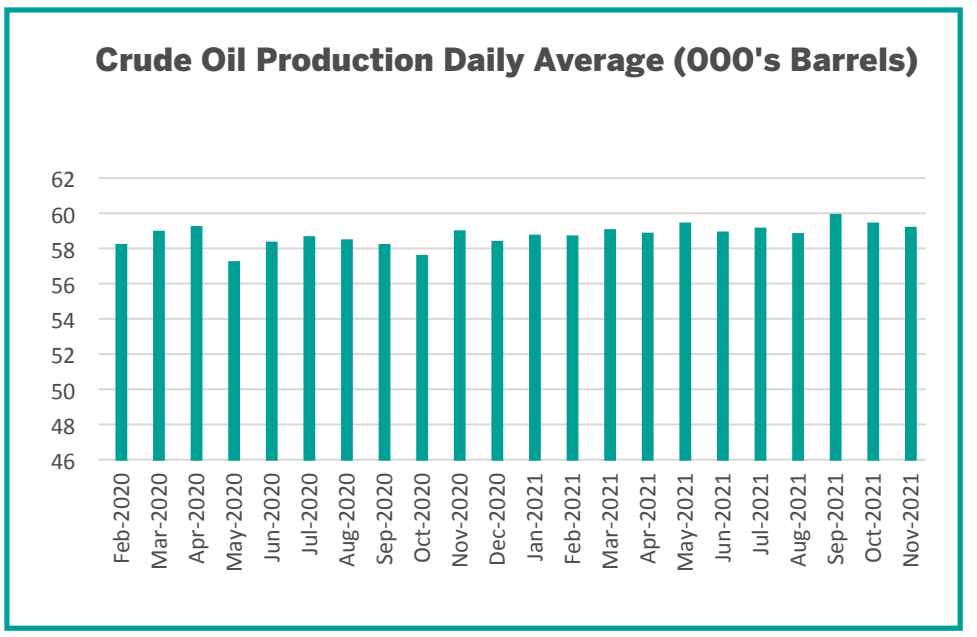
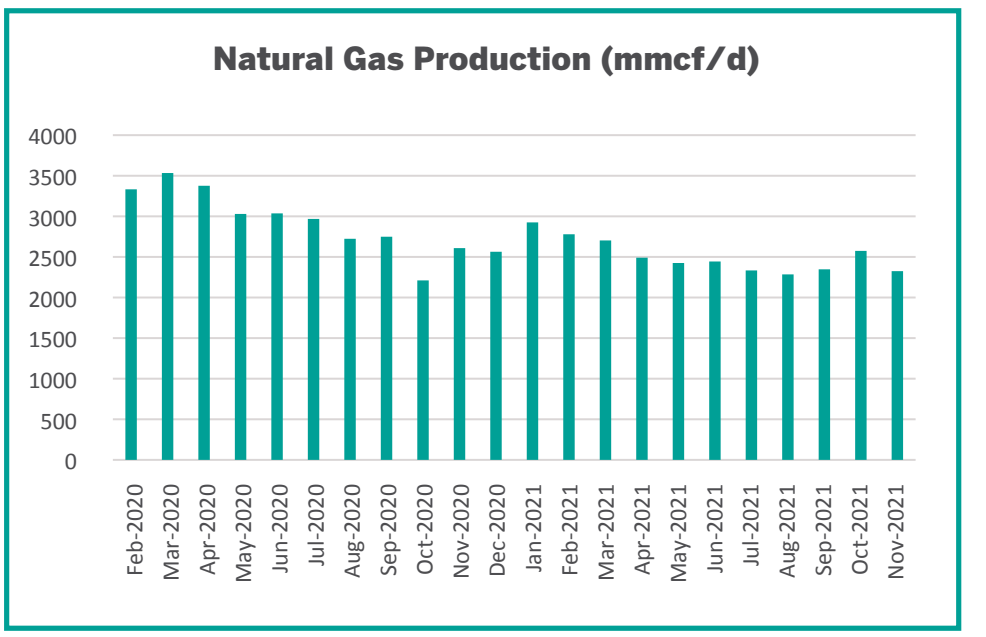
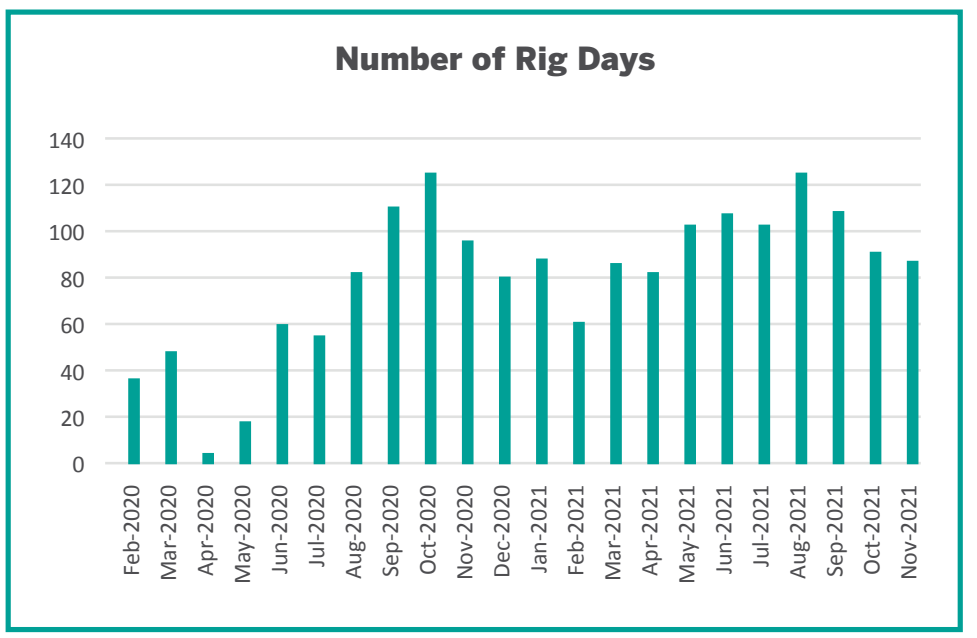
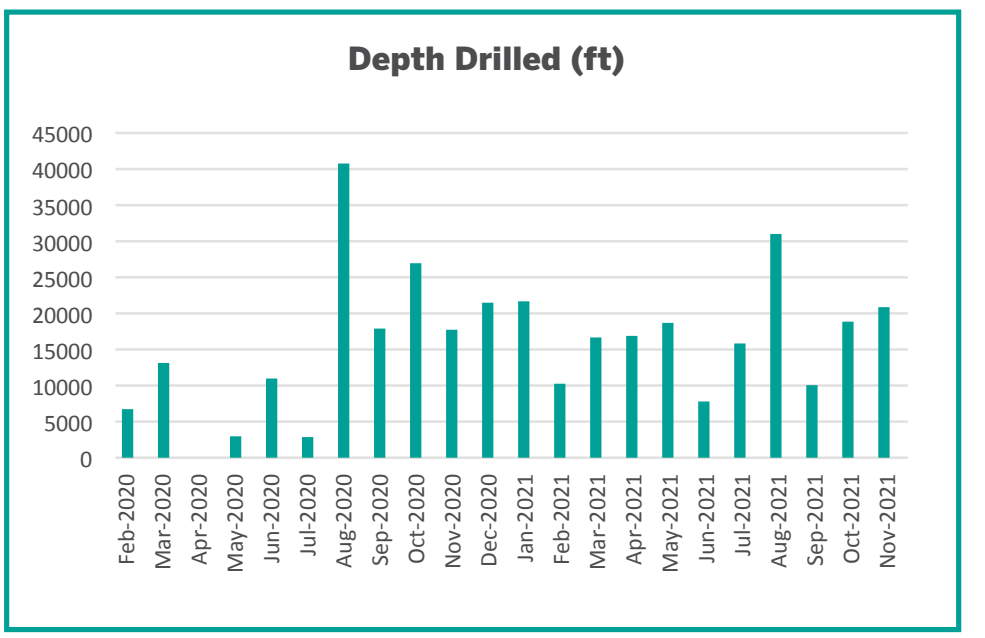
energy update

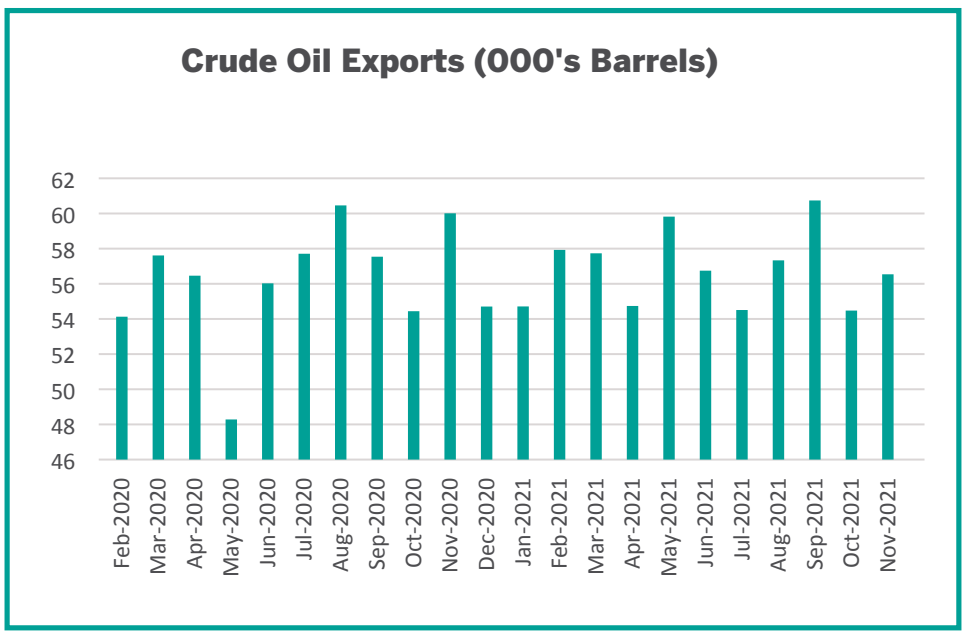
Monthly Review











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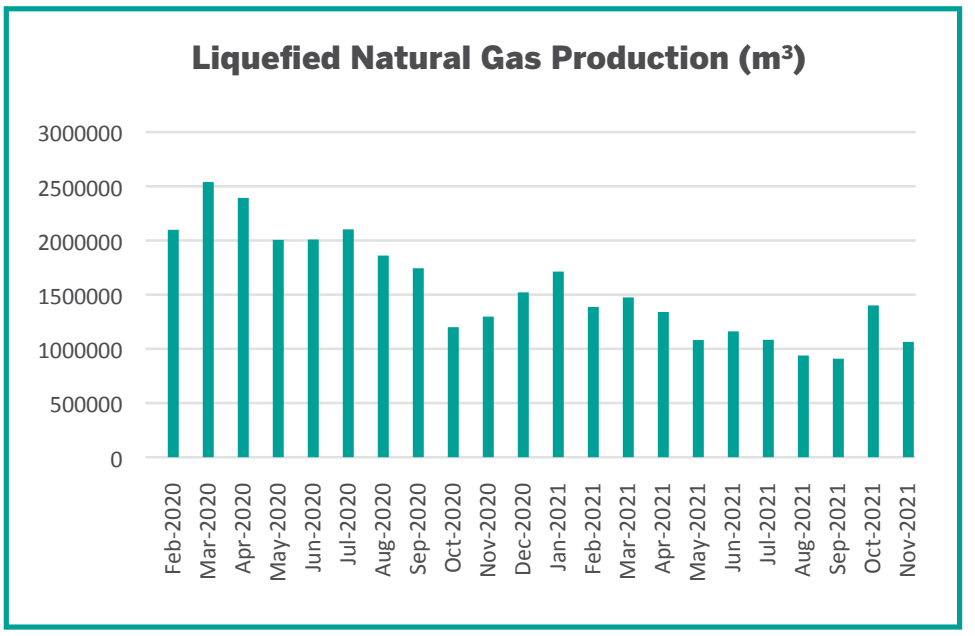
Liquefied Natural Gas Production (m³)
3000000
2500000
2000000
1500000
1000000
500000
0
Feb-2020
Mar-2020
Apr-2020
May-2020
Jun-2020
Jul-2020
Aug-2020
Sep-2020
Oct-2020
Nov-2020
Dec-2020
Jan-2021
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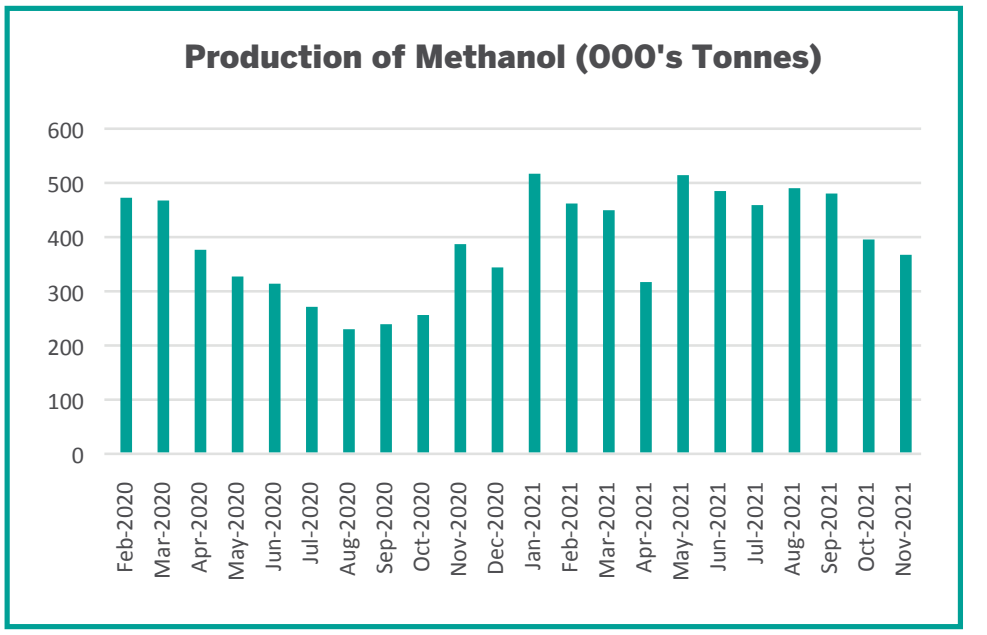
Production of Methanol (000's Tonnes)
600
500
400
300
200
100
0
Feb-2020
Mar-2020
Apr-2020
May-2020
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Jul-2020
Aug-2020
Sep-2020
Oct-2020
Nov-2020
Dec-2020
Jan-2021
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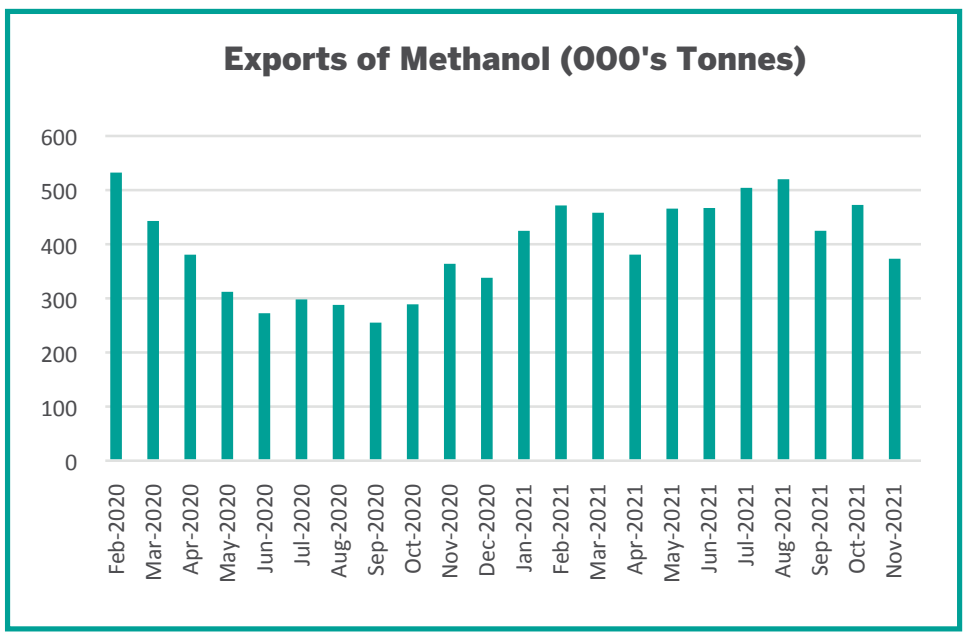
Exports of Methanol (000's Tonnes)
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200
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Jul-2020
Aug-2020
Sep-2020
Oct-2020
Nov-2020
Dec-2020
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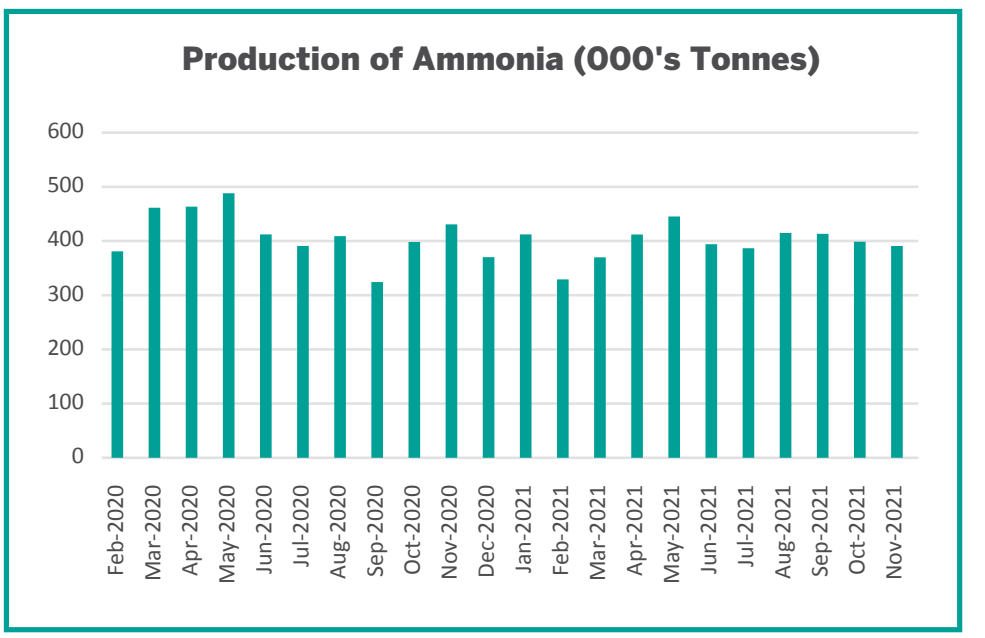
Production of Ammonia (000's Tonnes)
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500
400
300
200
100
0
Feb-2020
Mar-2020
Apr-2020
May-2020
Jun-2020
Jul-2020
Aug-2020
Sep-2020
Oct-2020
Nov-2020
Dec-2020
Jan-2021
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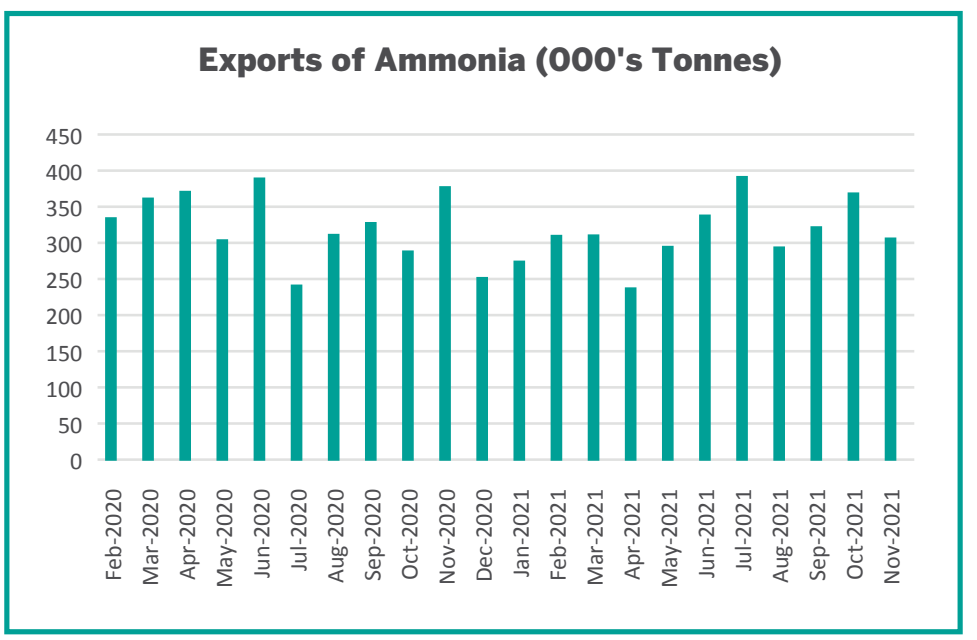
Oct-2021
Nov-2021


Exports of Ammonia (000's Tonnes)
450
400
350
300
250
200
150
100
50
0
Feb-2020
Mar-2020
Apr-2020
May-2020
Jun-2020
Jul-2020
Aug-2020
Sep-2020
Oct-2020
Nov-2020
Dec-2020
Jan-2021
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efficiency

Surging electricity demand is putting power systems under strain around the world

Staff Writer | Energy Chamber

Global electricity demand surged in 2021, creating strains in major markets, pushing prices to unprecedented levels and driving the power sector's emissions to a record high. Electricity is central to modern life and clean electricity is pivotal to energy transitions, but in the absence of faster structural change in the sector, rising demand over the next three years could result in additional market volatility and continued high emissions, according to a recently released IEA Report.

Driven by the rapid economic rebound and more extreme weather conditions than in 2020, including a colder than average winter, last year's 6% rise in global electricity demand was the largest in percentage terms since 2010 when the world was recovering from the global financial crisis. In absolute terms, last year's increase of over 1,500 terawatt-hours was the largest ever, according to the January 2022 edition of the IEA's semi-annual Electricity Market Report.

The steep increase in demand outstripped the ability of sources of electricity supply to keep pace in some major markets, with shortages of natural gas and coal leading to volatile prices, demand destruction and negative effects on power generators, retailers and end users, notably in China, Europe and India. Around half of last year's global growth in electricity demand took place in China, where demand grew by an estimated 10%. China and India suffered from power cuts at certain points in the second half of the year because of coal shortages.

"Sharp spikes in electricity prices in recent times have been causing hardship for many households and businesses around the world and risk becoming a driver of social and political tensions," said IEA Executive Director Dr. Fatih Birol. "Policy makers should be taking action now to soften the impacts on the most vulnerable and to address the underlying causes. Higher investment in low-carbon energy technologies including renewables, energy efficiency and nuclear power—alongside an expansion of robust and smart electricity grids—can help us get out of today's difficulties."

The IEA's price index for major wholesale electricity markets almost doubled compared with 2020 and was up 64% from the 2016–2020 average. In Europe, average wholesale electricity prices in the fourth quarter of 2021 were more than four times their 2015–2020 average. Besides Europe, there were also sharp price increases in Japan and India, while they were more moderate in the United States where gas supplies were less perturbed.

Electricity produced from renewable sources grew by 6% in 2021, but it was not enough to keep up with galloping demand. Coal-fired generation grew by 9%, serving more than half of the increase in demand and reaching a new all-time peak as high natural gas prices led to gas-to-coal switching. Gas-fired generation grew by 2%, while nuclear increased by 3.5%, almost reaching its 2019 levels. In total, carbon dioxide (CO_2) emissions from power generation rose by 7%, also reaching a record high, after having declined the two previous years.

"Emissions from electricity need to decline by 55% by 2030 to meet our Net Zero Emissions by 2050 Scenario, but in the absence of major policy action from governments, those emissions are set to remain around the same level for the next three years," said Dr. Birol. "Not only does this highlight how far off track we currently are from a pathway to net zero emissions by 2050, but it also underscores the massive changes needed for the electricity sector to fulfil its critical role in decarbonising the broader energy system."

For 2022–2024, the report anticipates electricity demand growing 2.7% a year on average, although the COVID-19 pandemic and high energy prices bring some uncertainty to this outlook. Renewables are set to grow by 8% per year on average, serving more than 90% of net demand growth during this period. We expect nuclear-based generation to grow by 1% annually during the same period.

As a consequence of slowing electricity demand growth and significant renewables additions, fossil fuel-based generation is expected to stagnate in the coming years, with coal-fired generation falling slightly as phase-outs and declining competitiveness in the United States and Europe are balanced by growth in markets like China and India. Gas-fired generation is seen growing by around 1% a year.

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Hydrogen economy hints at new global power dynamics

Staff Writer | Energy Chamber

Rapid growth of the global hydrogen economy can bring significant geoeconomic and geopolitical shifts, giving rise to a wave of new interdependencies, according to new analysis by the International Renewable Energy Agency (IRENA). *Geopolitics of the Energy Transformation: The Hydrogen Factor* sees hydrogen changing the geography of energy trade and regionalising energy relations, hinting at the emergence of new centres of geopolitical influence built on the production and use of hydrogen, as traditional oil and gas trade declines.

Driven by the climate urgency and countries' commitments to net zero, IRENA estimates hydrogen to cover up to 12% of global energy use by 2050. Growing trade and targeted investments in a market dominated by fossil fuels and currently valued at US$174 billion is likely to boost economic competitiveness and influence the foreign policy landscape with bilateral deals diverging significantly from the hydrocarbon relationships of the 20th century.

"Hydrogen could prove to be a missing link to a climate-safe energy future," said Francesco La Camera, Director-General of IRENA. "Hydrogen is clearly riding on the renewable energy revolution, with green hydrogen emerging as a game changer for achieving climate neutrality without compromising industrial growth and social development. But hydrogen is not a 'new oil', and the transition is not a fuel replacement, but a shift to a new system with political, technical, environmental and economic disruptions."

"It is green hydrogen that will bring new and diverse participants to the market, diversify routes and supplies and shift power from the few to the many," La Camera added. "With international co-operation, the hydrogen market could be more democratic and inclusive, offering opportunities for developed and developing countries alike."

IRENA estimates that over 30% of hydrogen could be traded across borders by 2050, a higher share than natural gas today. Countries that have not traditionally traded energy are establishing bilateral energy relations around hydrogen. As more players and new classes of net importers and exporters emerge on the world stage, hydrogen trade is unlikely to become weaponised and cartellised, in contrast to the geopolitical influence of oil and gas.

Cross-border hydrogen trade is set to grow considerably with over 30 countries and regions planning for active commerce already today. Some countries that expect to be importers are already deploying dedicated hydrogen diplomacy, such as Japan and Germany. Fossil fuel exporters increasingly consider clean hydrogen an attractive way to diversify their economies, for example Australia, Oman, Saudi Arabia and the United Arab Emirates. However, broader economic transition strategies are required, as hydrogen will not compensate for losses in oil and gas revenues.

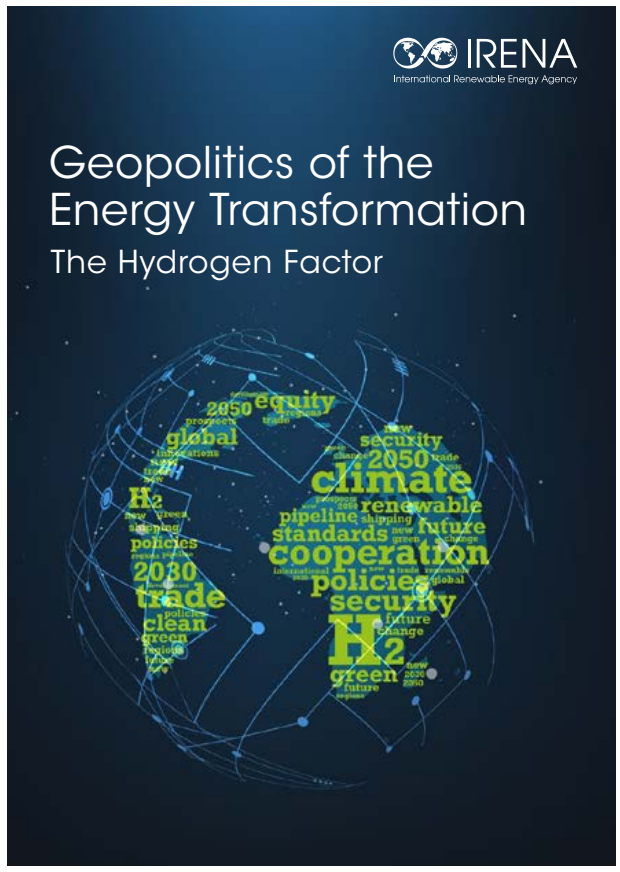
The technical potential for hydrogen production significantly exceeds estimated global demand. Countries most able to generate cheap, renewable electricity will be best placed to produce competitive green hydrogen. While countries such as Chile, Morocco and Namibia are net energy importers today, they are set to emerge as green hydrogen exporters. Realising the potential of regions like Africa, the Americas, the Middle East, and Oceania could limit the risk of export concentration, but many countries will need technology transfers, infrastructure and investment at scale.

The geopolitics of clean hydrogen will likely play out in different stages. The report sees the 2020s as a big race for technology leadership. But demand is expected to only take off in the mid-2030s. By that time, green hydrogen will cost-compete with fossil-fuel hydrogen globally, poised to happen even earlier in countries like China, Brazil and India. Green hydrogen was already affordable in Europe during the 2021 spike in natural gas prices. Refurbishing natural gas pipelines is likely to further boost demand and facilitate hydrogen trade.

Countries with ample renewable potential could become sites of green industrialisation, using their potential to attract energy-intensive industries. Furthermore, having a stake in the hydrogen value chain can boost economic competitiveness. The manufacturing of equipment like electrolysers and fuel cells in particular could drive business. China, Japan and Europe have already developed a head start in the production, but innovation will shape the current manufacturing landscape further.

Green hydrogen may strengthen energy independence, security and resilience by cutting import dependency and price volatility and boosting flexibility of the energy system. However, the raw materials needed for hydrogen and renewable technologies could draw attention to material security. Shortages and price fluctuations could reverberate through hydrogen supply chains and negatively affect cost and revenues.

Shaping the rules, standards and governance of hydrogen could lead to geopolitical competition or open a new era of enhanced international cooperation. Assisting particularly developing countries to deploy green hydrogen technologies and advance hydrogen industries could prevent the widening of a global decarbonisation divide and promote equity and inclusion, creating local value chains, green industries, and jobs in renewable-rich countries.



Download the IRENA report here:
https://irena.org/publications/2022/Jan/Geopolitics-of-the-Energy-Transformation-Hydrogen

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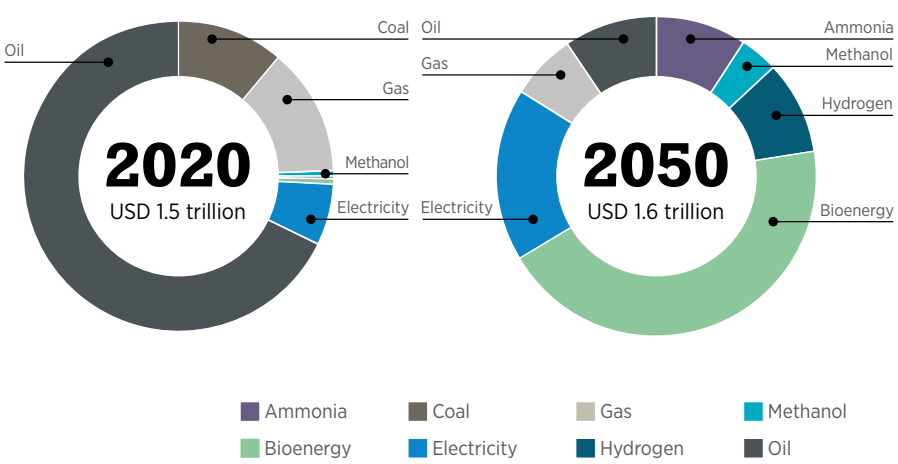
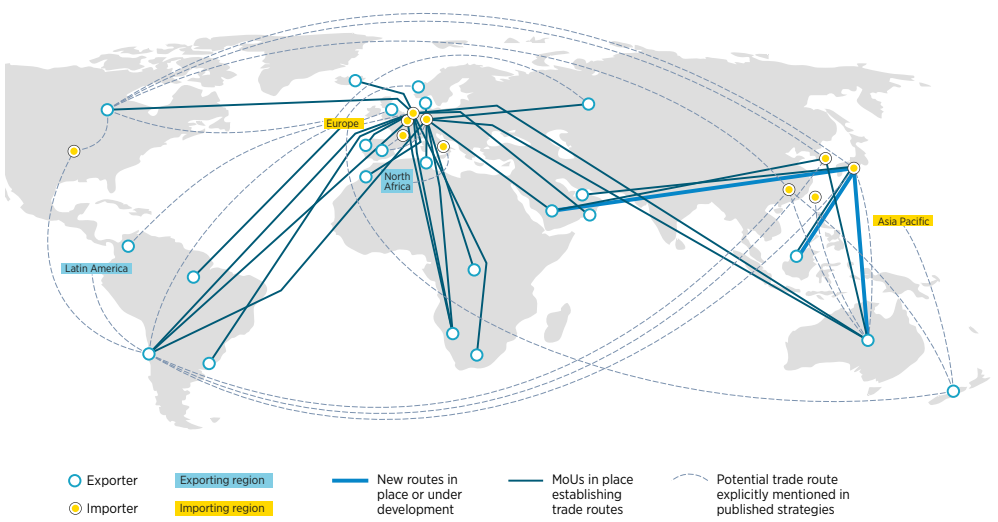
Figure S.1 Shifts in the value of trade in energy commodities, 2020 to 2050



Source: IRENA Report

Figure S.2 An expanding network of hydrogen trade routes, plans and agreements



Map source: Natural Earth, 2021

Notes: Information on this figure is based on the information contained in government documents at the time of writing.

Disclaimer: This map is provided for illustration purposes only. Boundaries and names shown on this map do not imply any endorsement or acceptance by IRENA.

Source: IRENA Report

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renewables

Yara and Linde Engineering agree to build a 24 MW green hydrogen demonstration plant in Norway

Staff Writer | Energy Chamber

Yara announced the signing of a contract with Linde Engineering for the construction and delivery of a green hydrogen demonstration plant at Yara's ammonia production facility at Herøya Industripark in Porsgrunn, Norway. The project, which is supported by a NOK 283 million grant from Enova (announced in December 2021), will demonstrate that ammonia produced using renewable energy can reduce the impact of carbon dioxide in fertiliser production.

The project will be realised by water electrolysis, which will produce green hydrogen to partially replace the hydrocarbon-based hydrogen production in Yara's plant, using proton exchange membrane (PEM) technology. This will be the second 24 MW PEM electrolysis plant designed and constructed by Linde Engineering; the first is now being built at the Leuna Chemical Complex in Germany.

"The project aims to supply the first green ammonia products to the market as early as mid-2023, both as fossil-free fertilisers, as well as emissions-free shipping fuel. Green ammonia is the key to reducing emissions from world food production and long-distance shipping. With this project, we move from intention to actions together with Linde Engineering and local contractors", says Magnus Ankarstrand, President Yara Clean Ammonia.

The plant will have an annual capacity of around 10,000 kg of hydrogen per day. It will replace ethane as raw material in production, thereby reducing 41,000 tons of carbon dioxide emissions annually, the same amount as emitted by roughly 16,000 passenger vehicles.

The electricity will be delivered from renewable energy sources and will provide enough hydrogen to produce 20,500 tonnes of ammonia per year, which can be converted to between 60,000 and 80,000 tonnes of green fertiliser, roughly five times the annual production of food-grade wheat in Norway. The project will be Yara's first step towards decarbonisation of the ammonia industry.

"This project showcases Linde Engineering's market leadership in electrolysis projects. Given the growing demand from the fertiliser industry for green hydrogen, this plant is a step towards further upscaling and increasing the size of these projects worldwide," said John van der Velden, Senior Vice President Global Sales & Technology, Linde Engineering.

Yara will, in addition to Linde, work with a significant number of local suppliers in the Grenland region on this project. This will contribute to creating new jobs and build valuable competence and experience for the green transition locally.

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MPC Capital to purchase four methanol powered container vessels

Staff Writer | Energy Chamber

Hamburg-based asset and investment manager MPC Capital, together with partners, ordered four container vessel new buildings at Korean shipyard Hanjin. The vessels have a capacity of 5,500 TEU and offer state-of-the-art specifications and eco-friendly design. Delivery of the first vessel is scheduled for Q2 2023.

The 5,500 TEU eco-design allows for a saving of 40% in consumption in comparison to the existing fleet and for a conversion to carbon-neutral operations based on green methanol. Underlining its high-efficiency, the ship design has a high-profile environmental DNV notation and will be built compliant with EEDI-Phase 3 and NOx Tier III standards.

The MPC Capital group, directly or through its subsidiaries, will provide a range of services, including commercial and technical management.

Christian Rychly, Managing Director Shipping at MPC Capital, said, "We are convinced that the demand for new container ships with favourable specifications, a low consumption and high environmental ranking, will increase. The order book in this size segment is fairly low, and 80% of the vessels in the water today are non-eco ships. At the same time, the positive momentum in the container market continues. Fundamental data signal a further tightening of the supply of assets, and with limited yard capacity available, the ordering of new ships with these non-replicable delivery positions in 2023 provides a very unique opportunity."

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Methanol vessel to dock In T&T

Staff Writer | Energy Chamber

Proman Operations Managing Director Alyeea Ali, speaking at the Energy Chamber's Caribbean Sustainable Energy Conference 2022, indicated that the newly built *Pro Patria* will dock in T&T in the coming months.

Aleeya Ali said, "We see investing in methanol-powered vessels as a tremendous enabler for the faster transition to reducing emissions for a lower carbon future. Over the past few years, we began construction of six state-of-the-art methanol dual-fuel vessels in partnership with the leading global shipping company Stena. We will be using some of these vessels to cleanly transport our methanol to customers starting in 2022 with the Stena *Pro Patria*, which would arrive in a few months."

In November, Proman Stena Bulk successfully completed the launching of the Stena *Pro Patria*, the first of three 49,900 dwt methanol dual-fuel MR tankers that Proman and Stena Bulk are building together as part of their JV.

Proman has indicated that another five methanol-powered newbuilds: Stena *Pro Mare* and Stena *Prosperous*, which will be Proman Stena Bulk JV vessels, and the Proman-owned *Provident*, *Progressive* and *Promise* will also be built. All vessels will be constructed at Guangzhou Shipyard International and delivered by the end of 2023.

The *Provident* and *Progressive* will be traded globally for shipping chemicals and clean petroleum products, enabling shipowners worldwide to experience the environmental benefits and emissions reductions of these 100% renewable-ready methanol-powered vessels.

All Proman and Proman Stena Bulk JV vessels will utilise the same pioneering vessel design and innovative MAN B&W 6G50ME-C9.6 MW Tier III engines. The vessels will also be equipped with the latest energy efficiency technology, including continually controlled combustion, optimised tuning, redesigned and aerodynamic hull lines, and an energy shaft generator, reducing fuel consumption and helping to meet strict emissions criteria. Each vessel will use approximately 12,500 tonnes per annum of methanol as a marine fuel. Using widely available and cost-competitive 'grey' methanol produced from natural gas, greenhouse gas (GHG) emissions in the vessels' normal commercial operations will be significantly reduced compared to conventional marine fuels. This includes the virtual elimination of sulphur dioxide and particulate matter, 60% reduction of nitrogen oxide and a cut in carbon dioxide, offering immediate improvements to air quality around ports and coastlines.

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Wärtsilä hits methanol milestone with first newbuild engine order

Staff Writer | Energy Chamber

The technology group Wärtsilä has received its first order for newbuild methanol-fuelled engines. A new Offshore Wind Installation Vessel (WIV) being built for Dutch contracting company Van Oord at Yantai CIMC Raffles shipyard in China will be powered by five Wärtsilä 32 engines capable of operating with methanol.

The order, which includes the methanol fuel supply system, was placed in December 2021, and it will be booked in the order book in Q1 2022. The delivery of the equipment is scheduled for early 2023.

The methanol engine order extends Wärtsilä's leading position in support of the maritime industry's decarbonisation ambitions, and in the use of the fuel. Wärtsilä has over half a decade's experience with methanol, having converted the first of four engines on Stena Germanica to use the fuel in 2015.

"We see methanol as one of the alternatives to meet the industry's goals to reduce its environmental impact," said Harold Linssen, Project Director, Van Oord. "We are pleased to be the pioneer of Wärtsilä's latest methanol-fuelled engine technology."

'Green' methanol is among the potential and most promising future fuel candidates. It is made using hydrogen from renewable-sourced electricity and recaptured carbon. The benefits of methanol are that it is relatively inexpensive to produce, is widely available, and easy to store. Furthermore, the global supply infrastructure is already established.

In line with its strategy to meet future development needs through collaboration with key stakeholders, Wärtsilä recently signed a long-term strategic cooperation agreement with Chinese shipyard Yantai CIMC Raffles. The cooperation is aimed at the design and development of future-proof solutions for newbuild vessels. This will include the use of future carbon-free fuels and other integrated technology solutions.

Following the agreement, Yantai CIMC Raffles awarded Wärtsilä the honorary title of "Excellent Partner" in recognition of its long-term support and cooperation.

"Leveraging the combined strengths of Yantai CIMC Raffles and Wärtsilä will ensure that we can deliver the best solutions to support our customers on their path to lower emissions," said Li Minggao, Vice President, CIMC Raffles.

"Enabling the use of methanol fuel is an important step along the path towards decarbonised operations. These cooperations will speed the work in bringing these fuels to the market, and in building ships that meet and exceed the regulatory and operational requirements for the coming decades," said Roger Holm, President, Wärtsilä Marine Power.

During the coming few years, Wärtsilä will commercialise engine technologies that allow the use of all alternative fuels currently under discussion. Given the modularity of modern engines, this means that owners can already today future-proof their existing assets and plan for the use of new fuels as and when they become available.

Wärtsilä will also supply a package of leading-edge thrusters to the Van Oord vessel for efficient station keeping. This marks the seventh order for Wärtsilä thrusters for WTIVs in 2021 and highlights the company's leading position in the offshore wind segment.

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Global oil and gas investments to hit $628 billion in 2022, led by upstream gas and LNG

Staff Writer | Energy Chamber

Global oil and gas investments will expand by $26 billion this year as the industry continues its protracted recovery from the worst of the pandemic and the hurdles imposed by the Omicron variant. An analysis by Rystad Energy projects overall oil and gas investments will rise 4% to $628 billion this year from $602 billion in 2021.

A significant factor behind the increase is a 14% increase in upstream gas and LNG investments. These segments will be the fastest-growing this year, with a jump in investments from $131 billion in 2021 to around $149 billion in 2022. Although this falls short of pre-pandemic totals, investments in the sector are expected to surpass 2019 levels of $168 billion in just two years, reaching $171 billion in 2024.

Upstream oil investments are projected to rise from $287 billion in 2021 to $307 billion this year, a 7% increase, while midstream and downstream investments will fall by 6.7% to $172 billion this year.

"The pervasive spread of the Omicron variant will inevitably lead to restrictions on movement in the first quarter of 2022, capping energy demand and recovery in the major crude-consuming sectors of road transport and aviation. But despite the ongoing disruptions caused by COVID-19, the outlook for the global oil and gas market is promising," says Audun Martinsen, Head of Energy Service Research at Rystad Energy.

Drilling further into the numbers, global shale investments are forecasted to surge 18% in 2022, reaching $102 billion in 2022 compared with $86 billion in 2021. Offshore investments are set to increase 7%, from $145 billion to $155 billion, while conventional onshore will jump 8%, from $261 billion to $290 billion.

Regionally, Australia and the Middle East stand out, with Australia likely to see a jump in investments of 33%, thanks to greenfield gas developments. In the Middle East, investments will rise by an anticipated 22% this year as Saudi Arabia boosts its oil export capacity and Qatar expands production and export capacity of liquefied natural gas (LNG).

This year's investment growth is very much pre-programmed by the $150 billion worth of greenfield projects sanctioned in 2021, up from $80 billion in 2020. Sanctioning activity in 2022 is likely to closely match 2021 levels, with a similar amount of project spending to be unleashed over the short to medium term.

Sanctioning activity is set to rebound in North America, with over $40 billion worth of projects due for sanctioning in 2022. Six LNG projects are expected to receive the green light, five in the United States and one in Canada. Offshore projects will also provide ample opportunities for contractors as TotalEnergies' North Platte project enters the final stage of its tender process and LLOG Exploration's Leon and Chevron's Ballymore developments in the US Gulf of Mexico look to proceed to the development phase in 2022. For Africa, however, 2022 is expected to be another quiet year with expected sanctioned projects worth a comparatively small $5 billion.

When it comes to offshore field sanctioning, there are around 80 projects worth a total of $85 billion in the global approvals pipeline for 2022. Of these, 10 are floating production storage and offloading units (FPSO), 45 involve subsea tiebacks, and 35 are grounded platforms. Latin America and Europe will be responsible for around 24% each of the total offshore sanctioning values next year, with deepwater expansions expected in Guyana and Brazil and Norway following recent tax changes.

The number of sanctioned offshore projects is expected to rise year-over-year but will remain little changed when measured by capital commitments. An outstanding concern for 2022 is execution challenges related to the pandemic and increased inflationary costs for steel and other input factors. These are likely to make operators mildly cautious regarding significant capital commitments. In addition, major offshore operators are being challenged on their portfolio strategy as the energy transition unfolds, with many exploration and production companies already directing investment budgets to low-carbon energy sources.

For offshore contractors, the energy transition could be advantageous for wind power developments. Spending in the offshore wind sector reached almost $50 billion last year, double the 2019 levels. By 2025, Rystad expects offshore wind investments will rise to $70 billion as demand for clean energy surges. By contrast, the offshore oil and gas sector is set to face a challenging energy transition period with oil demand likely to peak in the next five years, capping offshore investment at about $180 billion in 2025.

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