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Can Trinidad & Tobago and Venezuela help fill Europe's gas shortfall?

With Europe pushing hard to reduce their reliance on Russian gas, in the aftermath of the invasion of Ukraine, Trinidad & Tobago's Liquified Natural Gas (LNG) exports have come into the geopolitical spotlight, and this has also brought the issue of Venezuelan gas exports to Trinidad back onto the agenda. page 3

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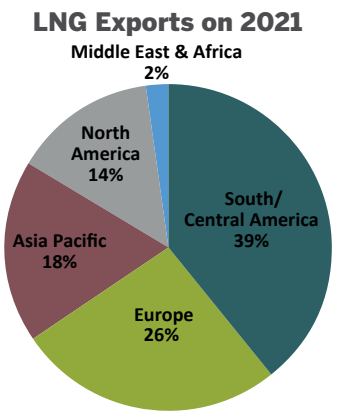
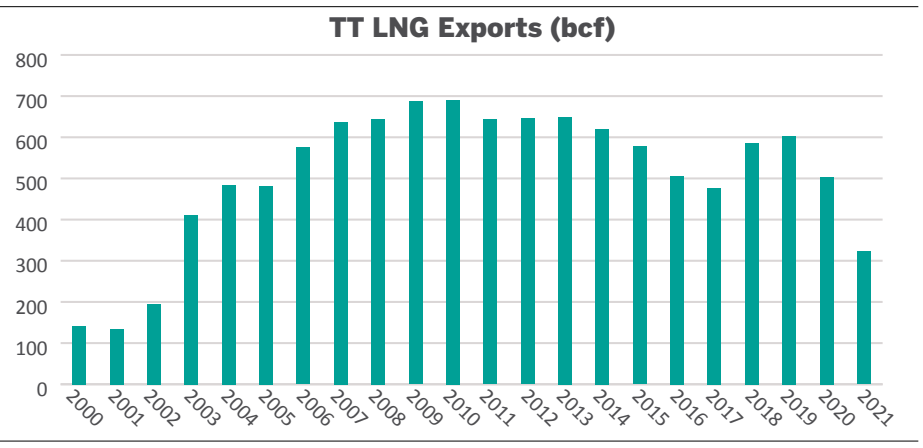
Can Trinidad & Tobago and Venezuela help fill Europe's gas shortfall?

Continued from page 1

In 2021, Trinidad & Tobago was the sixth biggest LNG exporter of Liquified Natural Gas (LNG) into Europe, after the USA, Qatar, Russia, Algeria, and Egypt, accounting for about 2% of the total LNG imports into Europe. Trinidad LNG is especially important in the Spanish market, where it accounted for 5% of imports in 2021. With Europe grappling with reduced supply, every source of gas has assumed additional importance.

Exports to Europe accounted for around 26% of total Trinidad LNG exports in 2021, with exports to regional markets in central American, the Caribbean and Latin America being the most important with around 40% of exports. However, Trinidad & Tobago's Minister of Energy, Stuart Young, recently stated that up to 40% of Trinidad's LNG exports were delivered to Europe in the first half of 2022; a significant increase.





Underutilised capacity

With falling domestic gas production in Trinidad & Tobago over the past few years, Trinidad's total LNG exports have been decreasing with LNG production in the first 5 months of 2022 just 57% of the peak production achieved in 2009. While this decline in production means that Trinidad does not have the gas resources immediately available to deliver more gas to Europe, it does mean that there is significant underutilised midstream infrastructure and available LNG gasification facilities available. Unlike other producers, Trinidad does not need to secure significant investment in greenfield processing facilities to make more gas available for delivery to international markets. Train 1 of the Atlantic LNG export facility, with a processing capacity of 3 million tonnes per year of LNG, has been offline since 2020.

This underutilised LNG processing capacity represents a significant opportunity if Trinidad & Tobago could increase its domestic gas production. Major gas producers in Trinidad & Tobago, including Shell, bp and EOG Resources do have projects either in execution or under development that could help shore up falling gas production. However, these projects are unlikely to increase overall production and will just help offset natural reservoir decline. Woodside, who recently acquired the upstream petroleum assets of BHP, are reviewing the development options for the 3.,5 trillion cubic feet of natural gas resources announced for the Calypso Project along with their partner bp, but this gas is unlikely to be available until nearer the end of the decade.

With the constraints on domestic production, the Government of Trinidad & Tobago has been actively exploring the possibility of importing pipeline gas from neighbouring countries to pass through the existing Trinidad infrastructure. In the longer-term gas may be available form Guyana and Suriname, but the most immediate source of natural gas would be from neighbouring Venezuela. Exporting gas from Venezuela to Trinidad by pipeline to put through the Atlantic facility for onward delivery to international markets is, however, constrained by the economic sanctions placed on Venezuela.

With reserves of over 220 trillion cubic feet (tcf) of gas, Venezuela is one of the world's major sources of gas reserves (in addition to its oil reserves). By contrast, Trinidad & Tobago has just over 10 tcf of gas reserves. Production of natural gas in Venezuela has, however, been severely constrained due to the poor investment climate, the lack of a domestic market and the inability to develop gas projects for export. Despite its significant reserves Venezuela produces less gas than Trinidad & Tobago.

Relaxing of sanctions

Speaking at various regional and international fora over the past few months, the Trinidad & Tobago Prime Minister, Dr. Keith Rowley and Minister of Energy, Stuart Young, and indeed other CARICOM leaders, including President Mohamed Irfaan Ali of Guyana, have repeatedly pointed out that relaxing the sanctions regime imposed on Venezuela to allow the export of pipeline natural gas to Trinidad would make a significant new source of LNG available to the international markets. Gas provided to the petrochemical sector in Point Lisas could also help provide much needed increases in ammonia, methanol and UAN production.

Stuart Young also recently visited Venezuela and met with President Maduro and other members of the Venezuelan cabinet. While details of the discussions were not made public, the meeting signals the two government's continued dialogue on issues of mutual concern. While national security is obviously high on the agenda for the two governments, advancing the previous efforts to export gas from Venezuela to Trinidad is a very obvious focus.

Venezuelan gas fields

If the sanctions were to be removed, gas from Venezuela could come from two major potential sources.

The first potential source is the many shallow- water offshore fields off the Venezuela coast that are close to existing infrastructure in Trinidad & Tobago. The Dragon field, off the northern coast of Venezuela's Guiria peninsular, is just 17 km from the Shell - operated Hibiscus platform in Trinidad and has sub-sea production infrastructure already installed. A project to deliver this Dragon gas was well advanced before additional sanctions were imposed in the aftermath of the disputed Venezuelan Presidential elections in 2018.

In addition to the Dragon field, there are also many multi-trillion cubic feet gas fields in the Plataforma Deltana region off Venezuela's largely undeveloped east coast and off the south-east coast of Trinidad. One major field in this region, the Loran-Manatee field, straddles the maritime boundary between Trinidad and Venezuela, with Shell currently progressing plans to develop the reserves on the Trinidad-side of the field (Manatee). The Plataforma Deltana region is close to major gas producing offshore areas in Trinidad, with extensive existing infrastructure in place.

The second potential source of gas from Venezuela is the large volumes of gas associated with current onshore oil production that are currently flared, given the lack of infrastructure and a market for this gas in Venezuela.

> Exports to Europe accounted for around 26% of total Trinidad LNG exports in 2021, with exports to regional markets in central American, the Caribbean and Latin America being the most important with around 40% of exports.

Venezuela is one of the ten countries which contributes to 75% of the total volume of flared emissions in the word. At present, Venezuela is the 6th largest.

The volumes of flared gas in Venezuela increased under sanctions, as the industry was unable to maintain the equipment that was previously used to reinject gas into oil reservoirs. Instead of being flared, this gas could, in theory, be collected and piped to Trinidad, using the existing onshore gas pipeline network in Venezuela and a new subsea pipeline from Guiria to tie into the Trinidad network. From a global climate change point of view this would be a clear win-win scenario, directly reducing CO2 emissions within Venezuela and making more gas available to offset other higher emitting fossil fuels, in particular the coal-fired electricity generation units currently being brought back online in Europe.

With the continuing demand to offset Russian gas in Europe, the availability of gas in Venezuela and the availability of infrastructure in Trinidad, there are strong geopolitical and economic reasons to revisit the existing sanctions on Venezuela gas exports. Trinidad & Tobago could play a major role in delivering more gas to Europe, but political decisions are needed for this to become a reality.

Note: Data in this article is source from the bp Statistical Review of Energy unless otherwise stated.

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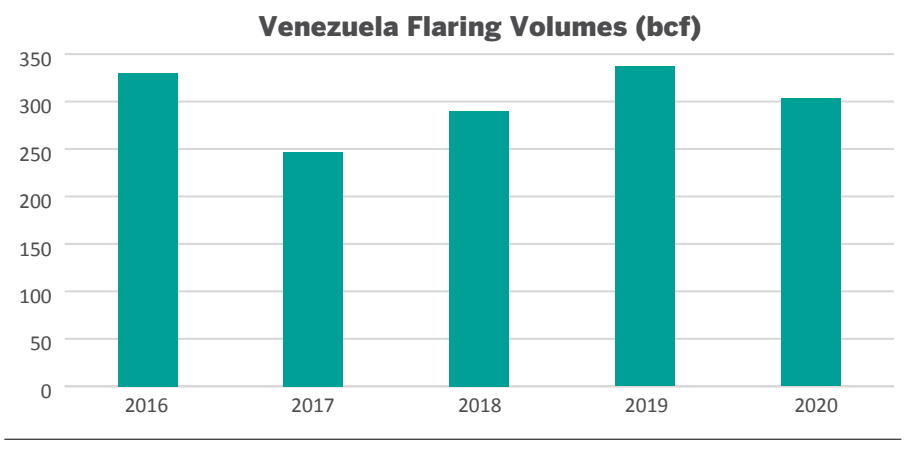

Source: WorldBank Global Gas Flaring Tracker Report 2021

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Former Grenadian Minister to lead UN climate change efforts

Staff Writer | Energy Chamber

UN Secretary-General António Guterres has appointed Simon Stiell as the new Executive Secretary of the United Nations Climate Change Secretariat based in Bonn, Germany. The appointment has been endorsed by the Bureau of the UN Framework Convention on Climate Change (UNFCCC).

From March 2013 to June 2022, Simon Stiell served as a senior minister in the Government of Grenada holding the portfolios of Minister for Climate Resilience and the Environment for five years. He also served as Minister for Education and Human Resource Development, Minister of State with responsibility for Human Resource Development and the Environment, and as a junior minister within the Ministry of Agriculture, Lands, Forestry, Fisheries and the Environment.

Mr. Stiell served as member of Grenada's Upper House of Parliament, the Senate, where he held the position of Leader of Government's Business throughout this period.

Prior to his return to Grenada, Simon Stiell had a successful career spanning fourteen years within the technology sector, holding senior executive positions in a number of industry leading companies, from Silicon Valley based technology start-ups, to major corporations including Nokia and G.E.C.

He originally trained as an engineer and holds a Master of Business Administration from the University of Westminster in the United Kingdom.

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Shamrock HSE receives EU grant funding for GHG baselining, verification and reporting project

Staff Writer | Energy Chamber

Shamrock HSE, a member of the Energy Chamber, participated in the Shaping The Future of Innovation programme, which is a partnership between the Government of Trinidad and Tobago through the Ministry of Planning and Development, the European Union (EU) and the Inter-American Development Bank (IDB) Lab, in collaboration with the Caribbean Industrial Research Institute (CARIRI) as the project implementing partner.

The Shaping The Future of Innovation programme seeks to build a more innovative and competitive economy in Trinidad and Tobago through economic diversification.

Shamrock HSE competed against 153 local company proposals for the first round, in which they were evaluated by an independent advisory panel that considered business performance, building local capacity, value proposition and business as well as environmental and social impact.

The company made it through to the second round of 42 companies and emerged as one of the final 15 companies selected for project funding.

Shamrock's project

Shamrock HSE aims to assist organisations that do not possess the inhouse ability to quantify and implement a carbon reduction programme by providing GHG software modelling, carbon reduction plans and verification services for companies in different market sectors to actively contribute to the reduction of GHG emissions.

The software modelling approach and imaging hardware will allow multiple industry segments to affordably gauge their current GHG emissions and implement reduction strategies. Many businesses are now implementing corporate strategies such as 'Net Zero' without really knowing of what tangible carbon reduction would actually consist.

This project is unique as it focuses on a tailor-made, integrated software and hardware solution, providing customers with quantifiable GHG Emissions and CO2 equivalents from their current operations. Shamrock's reporting template can be utilised to present this data along with different carbon reduction and energy efficiency plans that may be sustainably implemented locally.

About the Shaping the Future programme

Speaking at the Awarding of Grants Ceremony, His Excellency Peter Cavandish, the EU Ambassador to Trinidad and Tobago, said: "In 2015, it was determined that the focus for cooperation between the EU and Trinidad and Tobago would be innovation. The programme was launched in 2021 and is the flagship programme in our partnership with Trinidad and Tobago."

Andre Perseval, Principal Process and Safety Engineering Consultant, Shamrock HSE, receives symbolic award for project funding

He added that "The backbone of the programme is the Innovation Challenge Fund, which makes approximately TT$48 million in grants available to SMEs, the primary beneficiaries, to engage in innovative activities."

The Honourable Pennelope Robinson-Regis, Minister of Planning and Development, also spoke at the event and said: "The Shaping the Future of Innovation Programme aims to be a comprehensive programme that brings actors in the innovation sphere together to increase opportunities for innovative activities, the overall objective being a more diversified and innovation-driven society in Trinidad and Tobago. As we emerge from the pandemic, our citizens, our businesses and our organisations must pivot into a new mindset. We know that a nation which makes investments in innovation today will be dominant in the global economy tomorrow, and this programme therefore represents another significant investment in innovation by all the partners involved in this programme."

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EMA gives Touchstone Exploration environmental clearance

Staff Writer | Energy Chamber

Touchstone Exploration Inc. has announced that on August 16, 2022, the Company received a Certificate of Environmental Clearance (CEC) to conduct development operations within the Cascadura area of the Ortoire block from the Trinidad and Tobago Environmental Management Authority. Touchstone has an 80 percent operating working interest in the Ortoire block, with Heritage Petroleum Company Limited holding the remaining 20 percent working interest.

The CEC approves the construction of a multi-well surface production facility with a designed production capacity of 200 million cubic feet of natural gas per day, 5,000 barrels per day of associated liquids and 200 barrels per day of produced water, with a storage capacity of 8,800 barrels of liquids on the Cascadura A wellsite. In addition to the facility, the CEC includes the drilling of eight wells at two well pads (Cascadura B and C) and the establishment of associated pipelines and infrastructure within the Ortoire block.

Construction of the Cascadura surface facility and associated infrastructure required to bring on production from our two existing Cascadura wells will commence immediately, following the required notifications and conditions set out in the approved CEC. The National Gas Company of Trinidad and Tobago Limited has begun activity in the field to commence the construction of the 1.7 kilometre, 20-inch pipeline to the Cascadura facility.

Paul Baay, President and Chief Executive Officer, said, "This is a major step forward for the Cascadura project as we progress from the exploration phase to the development and production phase. It has been a thorough process, but the positive outcome now allows us to establish a clear and measurable five-year development plan for the discovery. We are working with our local contractors, and construction is underway at local fabrication shops for various aspects of the facility with all major facility components already delivered to Trinidad. We will provide updates on the project milestones as we move forward."

Learn more and have your say online:
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bpTT extends Prosafe SE contract for Safe Concordia

Staff Writer | Energy Chamber

Prosafe has announced that BP Trinidad and Tobago (bpTT) has exercised all four weeks of options for the Safe Concordia to continue providing gangway connected operations at Cassia C offshore Trinidad.

The work is expected to continue through to September. Total value of the contract extensions is approximately USD3.5 million.

Initially, the duration of contract was approx. 160 days from 24 March to 31 August 2022. However the contract allowed up to four weeks of options which are now being exercised by bpTT.

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Solar park at Piarco underway

Solar Park opening ceremony

Staff Writer | Energy Chamber

The Airports Authority of Trinidad and Tobago, in partnership with the European Union (EU), the Ministry of Planning and Development, the Ministry of Public Utilities, the Ministry of Works and Transport and the Ministry of Energy and Energy Industries, turned the sod to signal the commencement of the installation of an EU-funded 0.5 MW solar park at the Piarco International Airport.

This project, when complete, will be the first solar park in Trinidad and Tobago. Recently, we've seen some definite movements toward the development of several solar projects. Earlier this year, the Preysal service station was opened, which featured a significant solar array with battery storage that can fully power the facility using solar power. The Prime Minister and the Minister of Energy have also signalled that they are close to an agreement to move forward with Project Lara, a 112 MW solar project led by bp, Shell and Lightsource bp. This facility, when complete, will be one of the largest in the Caribbean.

The progress made by the Airports Authority and its partners to get this project off the ground is critical to encouraging further investment in the area of solar energy and renewables in Trinidad and Tobago.

In this project, ground-mounted solar panels will be installed at locations over an area of 1.54 ha with a minimum annual generation capacity of 767,034.6 kWh and the potential to avoid annually an emission of 536,694 kg of CO2. This will contribute to Trinidad and Tobago's commitment to the UN National Determined Contribution to reduce its carbon emissions by 15% until the year 2030.

Speaking at the sod turning ceremony, Chairman of the Airports Authority, Christopher Alcazar, said: "In the aviation industry, there is no disputing that we are one of the contributors of greenhouse gas emissions that lead to adverse effects on our earth's climate. Recognising this negative impact on our environment, the Authority has undertaken several strategic approaches to pursue the adoption of international best practice methods as well as recommended standards from the International Civil Aviation Organisation. In this way, we can work towards reducing the carbon footprint of our airports. As the Native American proverb goes, 'We do not inherit the earth from our ancestors, we borrow it from our children'."

Also present at the ceremony was His Excellency Peter Cavendish, the EU Ambassador to Trinidad and Tobago, who said: "The consequences of this project are an increase in Trinidad and Tobago's resilience to climate change by introducing renewable energy as an energy source for electricity generation, thereby contributing to energy security while reducing the use of fossil fuel based electricity both environmentally and economically. The consequences of this project are a substantive demonstration to the citizens of Trinidad and Tobago of the capacity of this country to implement state of the art technology to meet international commitments. The consequences of this project are that the commercial sector here in Trinidad and Tobago and in the region have a reference point for other future renewable energy projects as a part of their corporate social responsibility programmes."

"This solar park project falls under the EU's Green Deal and includes the Global Climate Change Alliance Plus Initiative (GCCA+). For those of you who may not be aware, the EU has set very ambitious goals to combat climate change – to achieve 55 percent fewer greenhouse gas emissions by 2030, with a longer-term vision to make the bloc climate neutral by 2050. The Green Deal is our roadmap to make those climate ambitions a reality. With this Piarco Solar project Trinidad and Tobago is again pioneering, just as Trinidad and Tobago was a pioneer in the transition to natural gas for the production of electricity."

Also in attendance was the Honourable Pennelope Robinson-Regis, Minister of Planning and Development. She iterated that this was "literally ground-breaking event, a landmark event in the history of Trinidad and Tobago, marking a turning point in the power generation sector and in the national climate change agenda. It is also what I am proud and pleased to call, the sign of a true partnership." She continued: "According to a 2013 baseline study, our per capita emissions amounted to 34 metric tonnes of carbon dioxide, placing us at the top of global rankings. Government therefore took decisive steps to address climate action through the development of a broad climate agenda, and recognising that the global crisis requires a global approach, we became a party to numerous international legally-binding agreements on matters relating to climate change, including the United Nations Framework Convention on Climate Change (UNFCCC), the Kyoto Protocol and the Paris Agreement."

In 2018, the Airports Authority engaged in a feasibility study, supported by the International Civil Aviation Organisation and the EU. The study focused on capacity building for CO2 mitigation from international aviation and the use of renewable energy sources within the aviation sector in Trinidad and Tobago, and identified suitable locations at the Piarco International Airport for a solar photovoltaic project that could be developed cost-effectively and compatibly.

In December 2019, the Authority signed a contract for funding with the EU to undertake the Solar Park project under the GCCA+ initiative, which helps the world's most vulnerable countries to address climate change.

In May 2022, Airports Authority of Trinidad and Tobago ("Authority") accomplished a key milestone by awarding a contract to Sinohydro Corporation Limited for the construction of the solar plant at Piarco International Airport.

The 0.5 MW solar park has a minimum annual generation capacity of 767,034 kWh and the potential to avoid approximately 500 metric tonnes of CO2 emissions annually. The power produced from the site is expected to contribute to the Authority's current annual electrical consumption at the Piarco International Airport, with capacity for future expansion.

The Authority is pleased to partner with all stakeholders to confront emerging issues on climate change and implement suitable measures for climate action.

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MOKVELD Introduces The First True Zero Emissions Valve

Mokveld Valves BV provides the gas and oil industry with expert knowledge and highly advanced engineered valve systems for critical control and safety applications

Reducing fugitive emissions is a top priority in the battle against climate change. That is why Dutch company Mokveld Valves BV is introducing a unique zero emission innovation - the world's first valve without dynamic seals to the atmosphere.

Mokveld has incorporated an electric actuator inside its new valve, eliminating the stem seal to atmosphere entirely. Common valve designs rely on stem seals to prevent process fluid leakage to the environment. Such dynamic stem seals are prone to wear and tear and degradation, over time showing increased emissions. By eliminating the stem seal altogether, Mokveld's new Zero emission valve prevents any leakage to atmosphere throughout the valve's entire life cycle. This ground-breaking technology brings achieving Scope 1 GHG goals one step closer - zero fugitive emissions.

mokveld
engineered valve systems

The Zero emission valve consumes very little power and requires a low actuation force. This is achieved by eliminating the stem seal and its associated friction in combination with Mokveld's trademark fully pressure balanced design. Power consumption over the valve's lifetime is reduced even further by cutting power to its drive under steady-state conditions, using a self-braking drive nut. This contributes towards achieving Scope 2 GHG goals - reduced indirect emissions.

The low actuation forces in combination with state-of-the-art servo control provides for unmatched control accuracy. The overall valve control performance is improved, with virtually zero dead time and zero overshoot.

Over eighteen months of field trials have fully confirmed the design's benefits, resulting in its TRL7 status.

Mokveld is well known for its tried-and-tested one-piece axial flow designs with its optimised flow path and full range of control trims. These served as the basis for developing this new valve. The valve's compact, lightweight design contributes towards achieving Scope 3 GHG goals - reduced value chain emissions.

Helping our clients reduce their Scope 1, 2 and 3 GHG emissions with the lowest possible environmental footprint, Mokveld proudly presents its next-generation valve - the Zero emission valve.

PSL is the local representative for: Emerson Process Management Valve Automation's - Shafer, Bettis, Dantorque and EIM brands valve actuators, Adams, Perar and Mokveld valves, Haskel pumps, Westlock Controls, and Automated Control Systems. The Company provides technical sales and service of original equipment manufacturer products, in industrial process components to the Oil and Gas, the Petrochemical and the Manufacturing Industries.

The Company's core competency being engineering support, includes equipment – specification, selection, and application. Services provided include new installation, equipment service, and after-market support maintenance for all products sold by the Company.

Our primary initiative is to provide customer satisfaction while building trustworthy, long-term relationships.

regional

Subsea 7 and Van Oord consortium awarded contract offshore Guyana

Staff Writer | Energy Chamber

Subsea 7 and Van Oord have announced the award of a substantial contract by ExxonMobil affiliate Esso Exploration and Production Guyana Limited (EEPGL) for the Gas to Energy project offshore Guyana, in water depths of up to 1,450 metres. Although a contract value has not been announced, Subsea 7 has indicated that the contract is between US$150 million and US$300 million.

The scope covers the project management, engineering, and installation of approximately 190 kilometres of pipeline, with an associated shallow water portion and onshore approach making landfall to the west of the Demerara River, along the coast of Guyana.

Craig Broussard, Vice President for Subsea 7 US, said: "We are honoured to have been selected for Guyana Gas to Energy. This is an important project to support the Guyanese people and we look forward to continuing our relationship with EEPGL in one of the most prolific and exciting development basins in the world."

Hans van Gaalen, Commercial Director for Van Oord, adds: "Van Oord is honoured to have been selected for the Guyana Gas to Energy project in cooperation with Subsea 7. Developing the coastal infrastructure for the project will allow our Subsea 7 and Van Oord consortium to positively contribute to the development of Guyana's electricity supply which in turn will reduce Guyana's dependence on imported fuels."

Learn more and have your say online:
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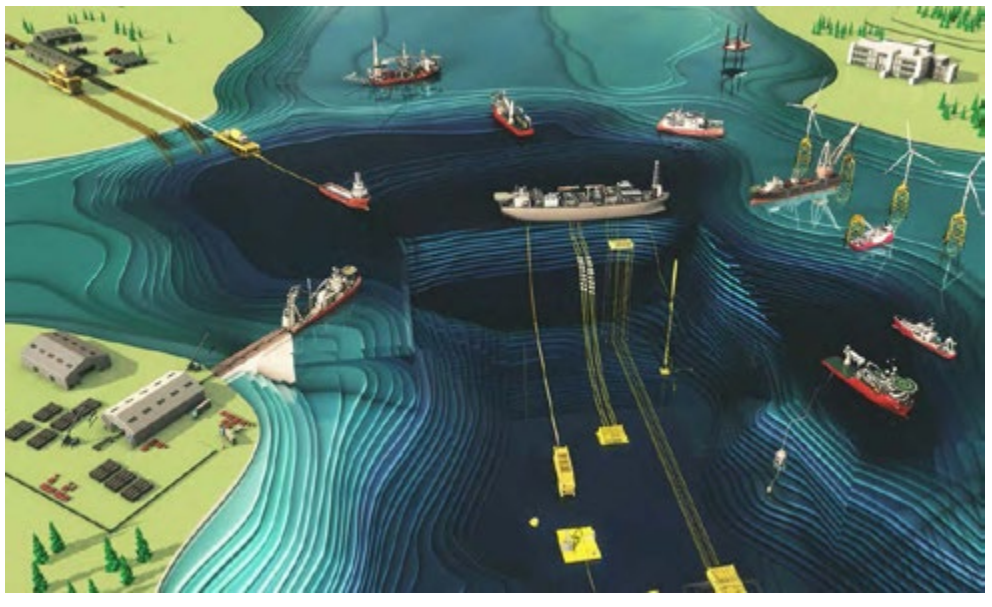

TechnipFMC awarded significant contract for gas to energy project in Guyana

Staff Writer | Energy Chamber

TechnipFMC has been awarded a significant contract by ExxonMobil affiliate, Esso Exploration and Production Guyana Limited, for the Gas to Energy Project in Guyana. TechnipFMC did not disclose the value of the contract, however stated in a note that the value of the contract was between $75 million and $250 million.

Subject to final project sanction, TechnipFMC will provide engineering, procurement, construction and installation of subsea risers and pipelines. The project will connect the production from Liza Destiny and Unity back to shore, delivering associated gas from the field to a gas-fired power plant that will supply electricity to the community.

Jonathan Landes, President, Subsea at TechnipFMC, commented: "The Gas to Energy Project is another example of how we are helping deliver the energy the world needs, and we are thrilled to be supporting another project in Guyana. We remain proud of our dedicated Guyanese employees and are committed to the continued development and expansion of local capabilities."

TechnipFMC currently employs more than 85 Guyanese, and expects to continue to hire and train additional local staff in support of this award.

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SBM Offshore completes US$1.75 billion financing of ONE GUYANA

Staff Writer | Energy Chamber

SBM Offshore has announced that it has completed the project financing of FPSO ONE GUYANA for a total of US$1.75 billion.

According to a press release from the company, the project financing was secured by a consortium of 15 international banks. SBM expects to draw the loan in full, phased over the construction period of the FPSO. The financing will become non-recourse once the FPSO is completed and the pre-completion guarantee has been released. The project loan is in line with the duration of the charter hence a two-year tenor post-completion and carries a variable interest rate based on SOFR plus 2.2% margin.

The FPSO ONE GUYANA builds on the experience to date of FPSOs Liza Destiny, Liza Unity and Prosperity.

SBM indicated that the design for FPSO ONE is based on SBM Offshore's industry leading Fast4Ward® programme that incorporates the company's new build, multi-purpose hull combined with several standardised topsides modules.

The FPSO will be designed to produce approximately 250,000 barrels of oil per day, will have associated gas treatment capacity of 450 million cubic feet per day and water injection capacity of 300,000 barrels per day. The FPSO will be spread moored in water depth of about 1,800 meters and will be able to store around 2 million barrels of crude oil.

The project is part of the Yellowtail development, which is the fourth development within the Stabroek block, circa 200 kilometers offshore Guyana. Esso Exploration and Production Guyana Limited, an affiliate of Exxon Mobil Corporation, is the operator and holds a 45 percent interest in the Stabroek block, Hess Guyana Exploration Ltd. holds a 30 percent interest and CNOOC Petroleum Guyana Limited, a wholly owned subsidiary of CNOOC Limited, holds a 25 percent interest.

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Liza Unity

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Grenlec urges consumers to save electricity as oil prices increase

Grenlec

Staff Writer | Energy Chamber

In Grenada, the electric utility Grenlec is urging its customers to use less electricity. The company has been drawing attention to the considerable increase in world fuel prices that is impacting the price of electricity, transportation and other products as well as services worldwide.

The company notes that between June and July, the fuel charge moved from EC¢70 to EC¢78 per kWh (unit of electricity), an increase of 8 cents over the last month.

In fact, since April the fuel charge per kWh has risen by EC¢21, driven solely by sharp increases in the price of crude oil worldwide.

While the developments in Europe have pushed prices higher, even before this, the recovery from COVID-19 started the upward trend in fuel prices.

Acknowledging the burden on customers of increasing prices, Clive Hosten, Acting General Manager of Grenlec, urges customers to conserve energy. "Conserving energy is about using only what you need and looking at all possible ways of eliminating waste. It is the one way that customers have of helping to control their electricity costs."

Grenlec has provided some relief through a temporary 25% reduction in the non-fuel charge, which was implemented in January 2022.

Despite this and other measures taken by Government of Grenada, the price of electricity is nearing levels last seen in 2008.

Hosten added, "We are grappling with a challenge that the entire world is facing and while there is no easy solution, if customers are consistently conserving, it will make a difference."

Over the coming weeks, Grenlec will intensify its efforts to help customers understand how they can save energy and reduce their electricity bills.

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Hope Wind Farm Project Guyana receives environmental go ahead

Staff Writer | Energy Chamber

Hope Wind Farm Project

The Environment Protection Agency has issued the Environmental Permit for the Hope Wind Farm Project on the East Coast of Demerara.

In September of 2018, Hope Energy Development (HED) submitted an application to construct and operate the wind farm. The permit was issued after an Environmental Impact Assessment was conducted by the Environmental Assessments Board.

The project proposes the construction of six wind turbines, located on a 27-acre state-owned lease at Hope Beach as well as private leases at Chapman's Grove, some 28km and 30km south-east of Georgetown centre, respectively. It is estimated that the 25.2MW wind farm will generate over 80GWh per year. Power generated will be delivered to Guyana Power and Light (GPL)'s grid according to the terms of a Power Purchase Agreement.

The project will fulfil over 10% of GPL's gross total electricity generation, which is enough to supply 7,000 homes with power from renewable sources.

HED is working with three partners – SPI (Denmark and Colombia), Innova Energy Ltd. from Trinidad and Tobago, and Total Energy Solutions Inc, Guyana.

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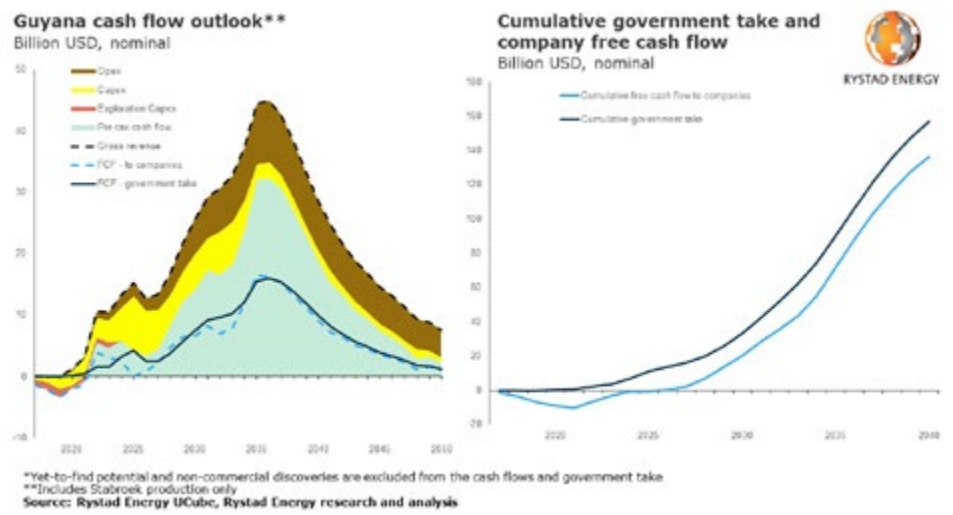
RYSTAD: Guyana O&G revenues break $1 billion in 2022 Projection: $7.5 billion in 2030



Staff Writer | Energy Chamber

As the burgeoning Guyanese offshore oil and gas industry goes from strength to strength, powered by the Stabroek block, government revenue from domestic production is on track to break the $1 billion mark this year and accelerate to $7.5 billion annually in 2030, according to Rystad Energy research. This year is set to be a turning point for the Georgetown government to start capitalising on the vast reserves in the offshore field, with revenues more than doubling over 2021 levels.

Low breakevens and below-average emissions intensity in the Stabroek will propel Guyana from a relatively small producer to a global leader in the coming years, solidifying the country's position as a competitive and policy-friendly player for offshore production.

The government's take* from the production is expected to increase until 2025, reaching $4.2 billion annually. Triggered by a forecasted drop in oil prices and continued spending on the field's development, government revenues will fall to $2.4 billion in 2027. Still, production growth is set to accelerate, with revenue momentum resuming as new pre-Final Investment Decision (FID) projects are sanctioned and brought online, leading to peak government revenues of $16 billion in 2036. These projections do not factor in as-yet undiscovered resources.

The recent spate of prolific discoveries and the steady pace of FIDs position the Guyanese government to reap the rewards of these finds with cumulative revenues totalling $157 billion by 2040.

Guyana is the global leader in total offshore discoveries since 2015, with 11.2 billion barrels of oil equivalent, amounting to 18% of discovered resources and 32% of discovered oil. Of the total, a whopping 9.6 billion barrels are oil, far outpacing the US in second place with a comparatively small 2.8 billion barrels. The Stabroek block accounts for all of these finds, but recent discoveries in other areas show the potential for growth elsewhere.

Guyana is forecasted to produce 1.7 million barrels per day (bpd) of oil by 2035—not accounting for as-yet undiscovered volumes—propelling the country to the fourth position on the list of the largest global offshore oil producers, leapfrogging the US, Mexico and Norway.

"Guyana is just starting to extract and monetise its vast resource wealth, and the coming years will be a financial windfall for the Georgetown government. The country has played the long game after several decades of elusive exploration. The country's offshore production is finally ready to take off," says Schreiner Parker, senior vice president and head of Latin America and the Caribbean at Rystad Energy.

Comparing the fiscal regimes of other offshore leaders, Guyana's is on the higher end, with the government take clocking in at 59% of total value. In contrast, applying the US fiscal regime to the Stabroek block would result in a government take of only 40%. Nigeria and Brazil align more with Guyana's fiscal policies, with 58% and 61%, respectively.

The cost of supply is a significant factor in considering the desirability of assets and comparing them to other sources and regions. Helping to transform Guyana into a global heavyweight in offshore production is its competitive breakeven costs, which average $28 per barrel across all projects and less than $20 for producing projects. Guyana's offshore oil fields are some of the most competitive supply sources outside of the Middle East and offshore Norway and are cheaper than the US onshore heavyweight the Permian, Russia and many other sources.

In addition, emissions intensity from offshore activity in Guyana is lower than the global average for oil and gas production and deepwater offshore production, further strengthening the country's position through the energy transition. Upstream emissions from Guyana's deepwater activities average 9 kilograms of CO_2 per boe, comparable to Brazil and slightly higher than Norway.

Although tensions with neighbouring Venezuela and Suriname have been an issue in the past, warming relations have allowed for increased drilling along the borders and boosted overall investor sentiment in Guyana.

Still, it may not be all plain sailing. Strong institutional governance, transparency and regulatory practices will be vital to unlocking the full potential of Guyana's resource wealth for its society. Although the government has taken steps to improve governance, including establishing a sovereign wealth fund and improving fiscal policy transparency, there are still improvements to be made. For instance, the Extractives Industries Transparency Initiative (EITI), which champions strong resource management and governance practices, recently found several weaknesses in Guyana's company reporting and tax processes. However, their EITI score will likely grow in the coming years as recent improvements take effect.

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Nutrien gets new President and CEO Ken Seitz

Staff Writer | Energy Chamber

The Board of Directors of Nutrien has appointed Ken Seitz as its President and CEO. Mr. Seitz will also join the Nutrien Board of Directors. The announcement follows an extensive seven-month global search, including internal and external candidates, led by the Board and supported by a world-class executive recruitment firm with a dedicated agriculture and chemical practice.

Nutrien is the largest provider of crop inputs and services and has substantial operations in Trinidad and Tobago, where it produces and exports ammonia and urea.

Mr. Seitz has served as interim CEO since January 2022 and brings more than 25 years of global management experience working across more than 60 countries, with deep experience in agriculture and mining sectors. Under Mr. Seitz's leadership, Nutrien has achieved record results, delivered bold actions in response to changes in agricultural markets, advanced the organisation's sustainability strategy and brought together key parties to help navigate unprecedented global food security challenges.

Russ Girling, Chair of the Nutrien Board of Directors, said, "Nutrien's record performance and disciplined execution of strategy during some of the most turbulent times we have seen globally underscore the strength of Ken Seitz's leadership. As the company's President and CEO, Mr. Seitz will continue to drive positive outcomes for all of our stakeholders as we strive to safely and sustainably feed the world."

Expanding on the Board decision, Mr. Girling stated, "Mr. Seitz is strongly aligned to our comprehensive leadership needs given his extensive international experience in our industries, passionate connection to our purpose, efficacy in driving our stated strategy and personal commitment to employee safety and an inclusive workplace. Additionally, Mr. Seitz demonstrated proven performance in an interim role this year receiving an extensive range of positive feedback from our stakeholders. The Board has every confidence Mr. Seitz is the right leader to drive our strategy forward."

Mr. Seitz said, "I look forward to continuing the important work of safely and sustainably feeding a growing world with the executive leadership team, our employees globally and support of the Board of Directors. Growing up on a dairy farm in Saskatchewan, I am honoured and humbled to work alongside growers during these challenging times today and going forward. Nutrien is extremely well positioned to help meet the global goals of food security and climate action, partnering across the food system. Our purpose is to feed the future, and I am invigorated by the noble pursuit to help solve these critical world needs."

Learn more and have your say online:
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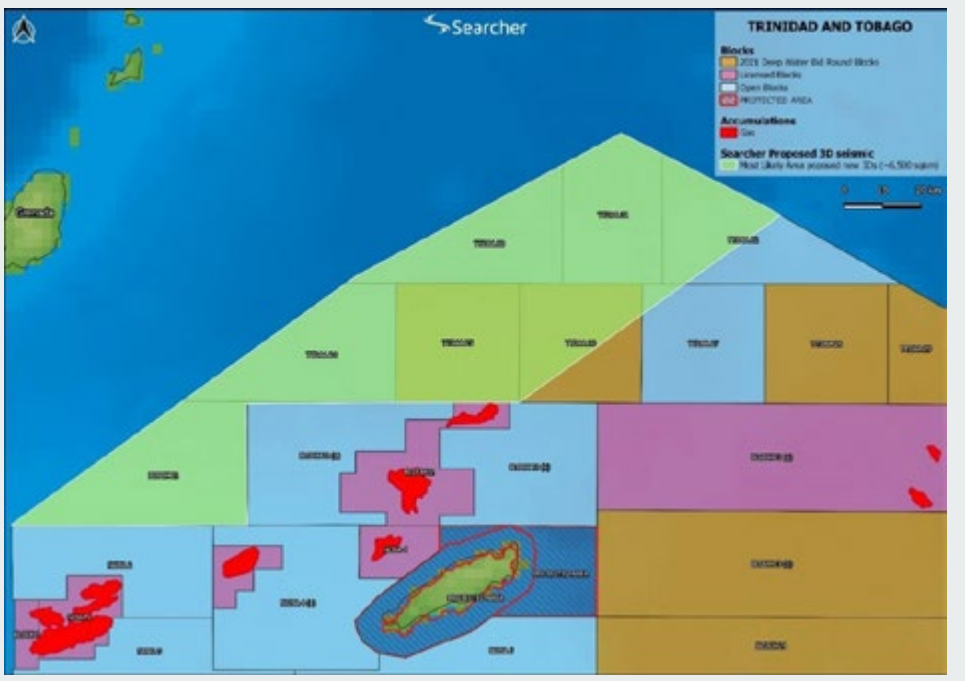
Searcher Awarded Multi-Client 3D Acquisition in T&T



Trinidad and Tobago proposed 3D seismic map rendering.

Staff Writer | Energy Chamber

Searcher Seismic, a leading provider of global multi-client geoscience data, is pleased to announce approval by the Government of the Republic of Trinidad and Tobago of Searcher's 6,500 km2 Tobago Trough 3D acquisition project.

Off the North Coast of Tobago lies the Tobago Trough, a Tertiary basin where high quality shallow marine sandstones have been found to reservoir giant gas reserves. Exploration and appraisal in the late 1990's brought the North Coast Marine Area (NCMA) gas fields (Hibiscus, Poincettia and Chaconia) into production, with gas being exported via Trinidad and Tobago's Atlantic LNG infrastructure. Subsequent development of the shore-face sand reservoirs has been tremendously successful, however very little exploration in the Tobago Trough has been undertaken to back-fill these now produced reserves. 2D seismic in this basin indicates that additional sequence stratigraphically controlled shoreface, channels and pro-delta fans lie in stratigraphic and structural stacked traps in the Tobago Trough, however, 3D data is required to delineate and explore for these targets.

The strategy of exploring this area to provide future development options that will feed into Trinidad and Tobago's LNG infrastructure is to increase LNG production into the growing global market where LNG provides tactical and strategic support to energy security. Additionally, LNG gas that replaces the use of coal for power generation is critical to global low carbon energy sustainability initiatives. Searcher is therefore leading the hunt for low-carbon energy in Trinidad and Tobago by seeking new gas resources close to the existing LNG hub.

Mr Alan Hopping, Searcher's GM of Business Development, said "Modern 3D seismic acquired in the Tobago Trough will offer such a security of assessment that the exploration of the prospectivity can be undertaken in a planned and considered manner. This will maximize investment efficiency and ensure production is optimized within the LNG export-infrastructure." The LNG trains comprising the Atlantic LNG facility have a production capacity of 15 mtpa of LNG. "The opportunity to explore shallow targets in Tertiary Deltas for seismically visible gas is a rare and exciting opportunity today, which we are happy to pursue with the aid and support of the authorities in Trinidad and Tobago." added Mr Hopping.

Searcher's acquisition is planned as a 6,500 km2 wide-tow long streamer acquisition and processed through to Pre Stack Depth Migration. The acquisition will commence as soon as an environmental impact assessment is complete and is currently scheduled for Q1 2023. Data will be available in Q4 2023 in time for the next Deep Water Licensing Round.

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opinion

Reform energy tax now to encourage investment

editorial

IN LAST YEAR'S national budget statement, the Minister of Finance announced that the Government would undertake a comprehensive review of upstream fiscal terms. Speaking shortly after the budget announcement at the Energy Chamber's annual policy review forum, the Minister of Energy announced that the review would be completed by the end of the first quarter of 2022. As of July 2022, this review has not been completed.

The Energy Chamber strongly encourages the Government to avoid any further delay in reforming the upstream fiscal terms in Trinidad and Tobago. The time to act is now.

With the continued push for net-zero by 2050, the window for investment in gas and especially in crude oil production is narrowing every day. Across the world, oil and gas companies have remained very disciplined in how they are allocating capital to upstream investments even with the current high global oil prices.

When oil and gas companies are assessing investments, they do not base their decisions on today's oil and gas prices, but rather on the future long-term projected prices. Companies want to make sure the investment makes sense at prices under US$50 per barrel as well as at prices over US$100 per barrel.

Unfortunately, in Trinidad and Tobago the structure of the upstream fiscal regime, especially for oil, means that it is extremely difficult to be profitable after-tax once prices are in the US$50 range. This is primarily because of the way in which royalties (on oil and gas) and supplemental petroleum tax (SPT, on oil) are calculated. While this does not impact investment in the acreage under production sharing contracts, it does impact potential investments in acreage under the Exploration & Production (E&P) licensing regime.

The current high-price environment does open a significant opportunity to restructure the tax system and to reform how these top-line taxes operate. Supplemental petroleum tax was originally introduced as a windfall tax to ensure that Government benefitted from the upside in times of high oil prices. Unfortunately, over the decades, the $50 per barrel price trigger point at which SPT becomes payable has remained the same, while inflation has marched ever onwards. US$50 per barrel would now be considered a low price.

When oil and gas companies are assessing investments, they do not base their decisions on today's oil and gas prices, but rather on the future long-term projected prices. Companies want to make sure the investment makes sense at prices under US$50 per barrel as well as at prices over US$100 per barrel.

By returning SPT to its original windfall focus, the Government would be able to still collect significant revenue in the current high price environment, but at the same time given oil and gas companies the assurance that they can still be profitable in the future if prices fall.

Likewise, changes to the gas royalty regime can be structured so that companies will pay higher royalty rates on larger and more profitable fields and lower rates on smaller and more marginal fields. This change would mean that exploration risk for gas production would be reduced and help spur on the much-needed investment in new gas production.

The Government has shown itself open to negotiating revised production sharing contract agreements to stimulate new investment. It now needs to do the same with the overall fiscal regime. With the current onshore bid round using the E&P licensing regime model, changes to the fiscal terms could help stimulate much needed interest in this acreage. The recent success of onshore exploration shows that there is still potential for new finds and new production in this mature acreage, but this will only be realised if companies bid for the acreage and allocated the needed capital investment.

The Government has repeatedly stated that it is prioritising increasing oil and gas production. It now needs to follow-up these words with action. Time is running out and the moment to act is now.

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Ministry of Energy and Energy Industries in Port of Spain

EnergyChamber of Trinidad & Tobago

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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

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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A data-driven approach to local content in Trinidad & Tobago and the region

Dax Driver | Energy Chamber

The Energy Chamber has developed a Local Content Management System (LCMS) based on extensive consultation with both service companies, operators, and other industry stakeholders. My hope is that this system, now fully entrenched in the industry, can become the basic tool that is used to measure and monitor local content.

Local content is often an emotive issue. It can get caught-up with ideas about identity and complicated by political positioning. The noise around local content can drown out any proper policy analysis.

This is why the Energy Chamber has placed a firm emphasis over the past few years on trying to put together an objective and transparent system to measure local content in Trinidad and Tobago.

As things stand today, upstream operator companies have an obligation to report to the Ministry of Energy on their local content policies and how they have performed. Unfortunately, these confidential reports to the Ministry of Energy are only ever reviewed internally and there is no system to aggregate and share the information submitted with wider industry stakeholders. The reports are not even reviewed by the Permanent Local Content Committee (PLCC) established under the 2004 Local Content and Local Participation Policy and Framework (which remains the guiding policy document for local content in Trinidad and Tobago).

As a long-standing member of the PLCC, I find this very frustrating. How can we guide local content policy if we do not have access to any data? However, instead of just complaining I have been trying to find an alternative way to address this problem.

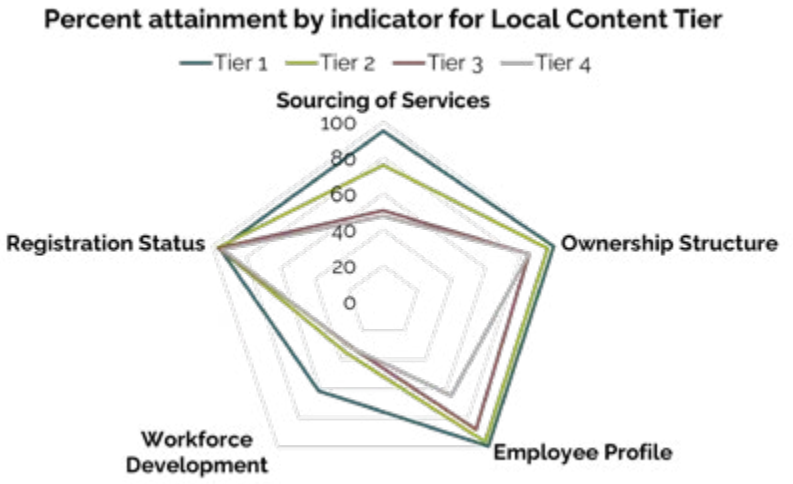
The lack of a proper system to report and analyse local content was recognised by the Energy Chamber back in 2017, when we brought industry players together to sign a Charter committing to a series of actions on local content, including a system to ensure transparent measurement and standardised reporting of progress in respect of local content delivery. Coming out of this commitment the Energy Chamber has developed a Local Content Management System (LCMS) based on extensive consultation with both service companies, operators, and other industry stakeholders. My hope is that this system, now fully entrenched in the industry, can become the basic tool that is used to measure and monitor local content.

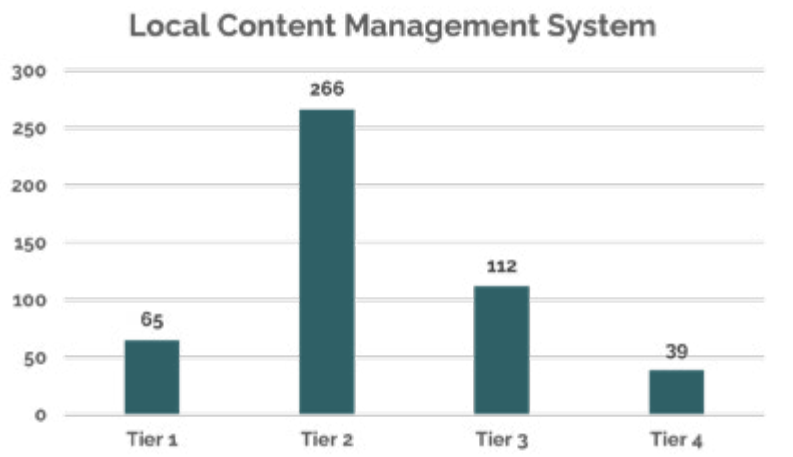
How does our LCMS work?

The heart of the LCMS is a detailed questionnaire filled out by companies who sell goods and services to the energy industry in Trinidad and Tobago. This questionnaire is designed to determine what percent of the spend by operators with these companies is retained in the local economy. The system is based around the "value retention" definition of local content that is included in the Trinidad and Tobago public procurement legislation, and which has also been adopted by the PLCC and the Energy Chamber through the Local Content Charter.

Services by Tier

Tier 1	Tier 2	Tier 3	Tier 4
Civil engineering services	Engineering services	Valves	Valves/actuators
Construction management	Welding & Fabrication	Actuators	Electrical services
Civil works	Civil engineering services	Control valves	Catalyst handling
General plant maintenance	Fabrication services	Utility software	Scaffolding
Welding & fabrication	Waste disposal	Spare parts	Information Technology





The "value retention" definition contrasts with the definition used by some other countries (for example Guyana) that places the emphasis solely on ownership and employment. With the mature energy service sector present in Trinidad and Tobago, the value retention approach, which concentrates how much of the spend of operators circulates in the local economy, was determined to be the more appropriate system by our stakeholder engagement process used to design the LCMS.

Over the past year we have gathered extensive data through the LCMS and we now have 482 companies who have submitted their questionnaires. The data coming out of the system is showing some really interesting patterns and highlights some of the important issues that we face in trying to maximise the retention of value in country,

As would be expected, there is a range in the local content scores obtained by service companies operating in Trinidad and Tobago. We have grouped the companies into tiers (1 through 4) and as the graphs show there is a distribution among service companies reflecting different amounts of value retention.

Service companies and contractors who have managed to achieve the highest scores are those who are mainly providing services which do not require large investments in equipment and/or raw materials or consumables sourced outside of Trinidad and Tobago. The most commonly listed service in the tier 1 companies was civil engineering services.

By contrast, the most common services listed by companies in tier 4 were services which rely upon expensive equipment, including the provision of equipment. As most of this equipment has to be imported, these companies have a lot of costs associated with providing this equipment. The table shows the top five services or supplies listed by companies in each tier.

As the second graph shows, companies in tiers 1–3 have less variation on average in their scores for ownership and employment (and everybody does well in terms of company registration scores), and what sets them apart is the percent of their inputs that they have to source locally.

Insights from the LCMS Data

It is clear from this perspective that restricting operators' ability to procure goods and services from locally owned companies will not have much of an impact on the value retained in the economy. The focus should instead be on making sure that there is a well-developed system of suppliers operating within the country and identifying goods and services that are currently imported that could instead be sourced locally. Some additional value can also be retained through prioritising local financing, which is one of the factors measured in the LCMS.

With the rapid growth of the energy sector in CARICOM there may also be significant opportunities to maximise the retention of value in the region if equipment could be more easily moved between the three main markets of Guyana, Trinidad and Tobago, and Suriname. I know it seems a bit counter-intuitive, but removing barriers to the free movement of equipment around CARICOM could actually help boost value retention in all economies of the region.

I hope that a more analytical, data-driven approach to local content can help develop the policies that are needed at the levels of specific companies, the overall industry, national governments and at a CARICOM level. The LCMS is a good place to start.

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SIX-POINT PLAN
TO SECURE NEW NATURAL GAS SUPPLIES AND MAXIMISE EXPORTS
FROM TRINIDAD & TOBAGO: 2022 – 2030

FAST-TRACK
bid rounds & the approval processes

1

Acreage needs to be awarded to competent operator companies for new exploration to take place. Improving regulatory approval processes will reduce the time between the award of new acreage and first gas production. This will significantly improve project economics and make new gas available faster. A one-year reduction in the time taken to first gas has been calculated to create US$ 120 million in additional net present value for a typical Trinidad & Tobago medium-sized offshore gas field.[1]

The current structure of upstream royalties and taxation does not encourage companies to reinvestment in exploration or the development of new fields. The fiscal regime, inclusive of the VAT system, needs to be reformed to unlock new investment.[2]

2

REFORM
upstream tax system to incentivise investment

INVEST
in reducing the carbon intensity of operations and products

3

Cross border adjustment mechanisms (CBAM) for carbon taxes pose a threat to exports of LNG, petrochemicals and iron and steel from Trinidad & Tobago, especially to the European Union. If Trinidad & Tobago commodity exports are to be able to sell to higher price premium markets the carbon intensity of production must be able to compete with other jurisdictions. This will require the reduction of CO_2 emissions from operations, reducing methane emissions and flaring, accessing offsets, and the introduction of low carbon molecules into the product mix (including green[3] and blue[4] hydrogen).

Gas for electricity generation is sold at prices far below the market rates for petrochemicals or export markets through LNG, which acts as a disincentive for upstream companies to invest in gas production. Reducing gas going to electricity, though both increased renewable generation and improved energy efficiency (including upgrades towards high efficiency electricity generation and higher reliability in IPP and distribution sectors) will make more gas available for these foreign exchange earning sectors and will improve the profitability of upstream gas developments.[5] Green hydrogen can also supplement natural gas as a feedstock.

4

DIVERT GAS
from domestic electricity generation through energy efficiency and renewables

Encourage innovative approaches to
SMALL FIELD DEVELOPMENT

5

As Trinidad & Tobago has matured as a gas province, new fields are often smaller and more difficult to develop. Working with the Ministry of Energy, operator companies need to find new ways of bringing this gas to market making the best use of existing infrastructure.

There are significant gas resources in neighbouring territories, especially Venezuela but also potentially in Barbados and Grenada (in the longer-term). In addition to significant untapped offshore gas fields, more natural gas is flared on the North Monagas oilfields in eastern Venezuela alone than the current shortfall in Trinidad production. Securing these resources for export to Trinidad is politically challenging but has huge potential economic benefits and, in the case of the flared gas in particular, significant climate change benefits as well.

6

Secure
CROSS BORDER SUPPLIES

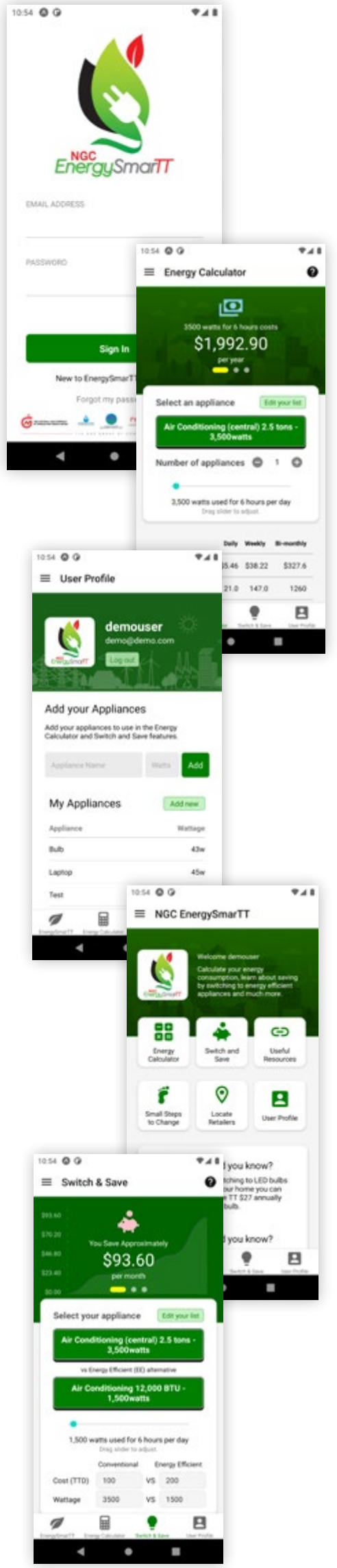
1. Kenesjay Systems Ltd "*Project Fast-track*" submission to T&T Energy Chamber, November 2019. A reduction in the time taken from bid round to first gas from the current average 5 years to 4 years would represent an increase in the NPV (8%) of a typical gas field in T&T from US$ 815 million to US$ 934 million.
2. Energy Chamber's Fiscal Reform Task Force "Final Report" delivered to Government of Trinidad & Tobago, August 2021.
3. Green hydrogen produced from the electrolysis of water or plasmification of waste.
4. Blue hydrogen produced from natural gas with Co_2 captured and sequestered (carbon capture and sequestration).
5. "*Draft Energy Conservation and Energy Efficiency Policy Action Plan 2020 to 2024*", submitted to Minister of Public Utilities, September 2019.

efficiency

NGC upgrades EnergySmarTT mobile app and CariGreen website

Lisa Burkett | Contributor

EnergySmarTT is an app, available for free download by the public, which aims to change behaviours and attitudes toward energy consumption, particularly at the domestic level, and increase awareness about the big picture environmental impact of personal choices.



In an effort to support national emissions reduction targets and broader global climate goals, The National Gas Company of Trinidad and Tobago Limited (NGC) has been working to build national capacity and consciousness around energy efficiency and renewable energy (EE/RE). In the past two years, the Company developed and launched two resources geared toward green energy education.

The first was the country's first mobile app around energy efficiency and conservation (EE&C)—EnergySmarTT. This app, available for free download by the public, aims to change behaviours and attitudes toward energy consumption, particularly at the domestic level, and increase awareness about the big picture environmental impact of personal choices. At the time of its launch in 2020, it was the first local energy education mobile application in Trinidad and Tobago and allowed anyone with an Android or Apple device to gain customised insights into his or her individual carbon footprint.

The second, launched in 2021, was the CariGreen website. NGC created CariGreen to be a repository for authoritative, updated information on Caribbean clean energy, to make it easier for investors, academics and citizens to conduct research in this area. The ultimate aim was to help expedite investment decisions and clean energy project development in the region.

Following the successful deployment of these resources, NGC decided to undertake expansion of both the app and website in 2022, to include more features that increase their value and streamline their functionality. These upgrades, executed in June 2022, are highlighted below.

EnergySmarTT 2.0

Building on the strengths of the original app, the second iteration of EnergySmarTT boasts several useful features:

1. The 'My Consumption' feature has been renamed 'Energy Calculator' and allows users to calculate their estimated electricity cost and carbon footprint on a daily, monthly or yearly basis. Users can select an appliance from the list, input their usage pattern and get an estimate of what they pay to power that appliance over the specified period.
   In addition, users can now input their desired expenditure on power for any given appliance, and the app would reveal what duration of usage would correspond to that figure, i.e. how many hours per day/week/month one would be able to use that appliance in order to limit its power cost to the stipulated amount.
   Additional upgrades under this feature will soon include a field for users to find out estimated T&TEC rebates, and an expanded appliance listing with commercial grade equipment used by small businesses and Light Industrial and Commercial (LIC) customers.
2. The 'Switch and Save' feature helps users understand the cost of purchasing an EE product. The app calculates the estimated payback period over which the purchase cost of an EE product would be amortised, i.e. how long consumers would have to wait before realising savings on their energy bills because of that purchase. Calculations illustrate the simple payback, monthly savings, and an estimated carbon savings breakdown per day/month/year.
   Additionally, the listing of products from which app users can select has been expanded to include more renewable energy products.
3. Energy Saving Tips are included to highlight the simple measures users can implement to reduce their consumption habits for common household appliances and products. The app is now also linked to NGC's CariGreen website, which allows users to learn about efficiency and conservation within the broader context of global climate action. This will help sensitise them to the big picture impact of managing their personal energy consumption.
4. The EnergySmarTT app has a unique feature which uses location-based services linked to mobile devices to highlight where EE products can be purchased within Trinidad and Tobago.

NGC has upgraded this feature to make it easier for businesses selling these products to get the requisite approvals to be featured on the app. It is envisioned that streamlining this process will attract more businesses to the platform and enrich the directory for app users.

Additionally, users are now able to search within a particular radius for stores that sell EE products, which further enhances their accessibility and improves likelihood of purchase.

An expanded CariGreen

Through the CariGreen website, NGC and its subsidiaries aim to:

- Provide a platform that brings together datasets, information products, economic data and climate change strategies from different sources into one central location to provide users with complete, timely and trusted information;
- Drive engagement, collaboration and conversation with stakeholders through integration of social media tools and development of energy reports; and
- Build the necessary relationships within the Caribbean and international energy information organisations to sensitise and inform citizens on matters related to green energy.

At its launch, the website's content was divided into:

- Project background and partner information
- Energy transition topics: renewable energy, energy efficiency, alternative fuels, carbon capture and sequestration
- Market information: research reports, funding agencies/mechanisms
- Caribbean territories: country-specific data from CARICOM and non-CARICOM members around energy transition projects and strategies

In 2022, NGC added a new category to house information about specific renewable energy projects in the region. Included here are specifications of over 100 wind, solar, geothermal, biomass, hydrogen and hydropower facilities and projects across Latin America and the Caribbean. The site profiles the capacity and location of these facilities, and links visitors to the respective facility websites for further information. This upgrade now makes it easier for site visitors to survey the landscape of regional clean energy.

Building stronger

As NGC intensifies its lobby for climate action at the industry, community and household levels, the Company will seek to introduce further innovations across all its energy education platforms, in an effort to amplify the reach and resonance of its messages. Users of the EnergySmarTT app and CariGreen website can therefore expect to see further enhancements and features in future.

NGC encourages all citizens to download the free EnergySmarTT app from their respective mobile application stores, and to visit the CariGreen website at www.carigreen.ngc.co.tt , to learn more about the movement to lower our collective carbon footprint. Action is urgently needed, and the personal choices we make today will determine what kind of planet we leave for our children.

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IETA: Carbon Markets set to continue growth as countries double down on climate ambition

Staff Writer | Energy Chamber

Carbon markets around the world are set to continue growing rapidly as countries double down on climate ambition, and as corporates continue to pursue net-zero goals, finds IETA's latest annual Market Sentiment Survey.

The growth is expected to extend to the voluntary carbon market, where efforts are underway to scale up supply of offsets to meet growing global demand, according to the survey, carried out by PwC UK's Sustainability and Climate Change team.

Prices in the EU Emissions Trading System (ETS) have more than doubled since the beginning of March 2021, when Europe was beginning to emerge from the shadow of coronavirus. Prices in other carbon markets have also risen, though by smaller increments.

"Europe's market has shown that carbon markets can be resilient to energy price shocks," says IETA's CEO and President Dirk Forrister. "The continued strength of the EU ETS throughout the Ukraine crisis demonstrates that climate ambition can be advanced in a way that reinforces energy security."

"This year's survey reveals bullish sentiment for carbon pricing globally, as price expectations hit record highs across all emission trading schemes surveyed," says Ian Milborrow, PwC Partner.

"Carbon pricing initiatives, which already cover over one-fifth of global GHG emissions, represent a critical lever to deliver the emissions reductions required to keep warming to below 1.5°C."

The conflict in Ukraine and the resulting concerns over energy security are likely to lead Europe to adopt more ambitious climate targets. Around half those surveyed this year said they expect Europe to strengthen its "Fit for 55" climate package and this, along with measures to cut Russian imports of fossil fuels and speed up the deployment of renewables, is expected to drive EU carbon prices to an average price of almost €100 in the period 2026-30.

Most respondents to the survey believe that the agreement reached at the climate talks in Glasgow last year is insufficient to achieve the global goal of net zero emissions by the middle of the century. 52% of survey respondents also say there has not been enough progress in translating commitments into action since COP26.

"At COP26, consensus was reached to finalise the Paris Rulebook. However, as the survey shows, stronger, more ambitious national commitments will be required to achieve the goals of the Paris Agreement," Milborrow adds.

On voluntary markets, nearly three-quarters of respondents—up from two-thirds in 2021—expect the market to partition between credits for carbon avoidance or reduction on one side, and carbon removals on the other by 2030. Most of those polled plan to use nature-based offsets in their market growth strategy.

"The voluntary carbon market has a critical role to play in directing private finance towards climate mitigation and nature-based projects. Improving the integrity and transparency of the market will be critical to guarantee its credibility and enable action at scale from the private sector," says PwC UK's Ian Milborrow.

More than 60% of respondents said the voluntary carbon market will be able to accommodate the growth in demand needed to meet net zero commitments.

"When the UNFCCC launched the Clean Development Mechanism in 1997, there was some doubt that demand would scale up to support the new system," Forrister says. "That experience taught us that if we do build an ambitious mitigation framework, investment will come, and it will come to the VCM as well."

The survey covers recent progress and expectations for compliance and voluntary markets across several geographies, as well as ahead of COP27.

In this year's survey there was increased optimism on carbon price expectations as climate ambitions ramp up. Expected prices for 2022-25 and 2026-30 have increased for every market surveyed, in comparison to last year's survey.

In addition, just 8% of respondents said the agreement reached in Glasgow at COP26 will be sufficient to achieve the goals of the Paris Agreement.

The survey also showed that the largest share of respondents expect the Article 6.4 mechanism to become operational between 2024 and 2025, with another 31% predicting it will start operating between 2026 and 2028.

IETA noted that the US is still unlikely to implement a federal carbon price, despite the expectation that other jurisdictions will launch Carbon Border Adjustment Mechanisms.

However, respondents were cautiously optimistic that the recent initiatives to streamline the voluntary carbon markets and enhance quality—such as the IC-VCM and VCMI—will bring greater transparency and standardisation.

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Proman subsidiary Eurotecnica wins world's largest melamine plant contract

Staff Writer | Energy Chamber

Eurotecnica, the technology arm of the Proman family of companies, a global leader in natural gas-derived products and services, announced the award of a contract for the implementation of the largest high pressure melamine plant in the world with a 120,000 ton per year capacity.

Xinji Energy Chemical Co.Ltd. has selected Eurotecnica's ultimate 5th generation (G5) proprietary Euromel technology for the design and implementation of this landmark project, which lifts the total licensed nameplate capacity to more than 1 million tons per year and 26 plants worldwide.

Xinjiang Xuefeng, the group Xinji belongs to, is already the largest melamine producer in the world, and has chosen Eurotecnica's Euromel because it features the lowest energy consumption on the market.

According to Proman, this feature, together with the traditional no-catalyst, no-added chemicals, no-effluents to be treated, makes Xinji's choice the most competitive in terms of operational as well as capital expenses.

The award confirms Euromel as the leading melamine technology in Asia, the Middle East and the Americas. Proman is the world's second-largest methanol producer and a leading producer of anhydrous ammonia, urea ammonium nitrate and melamine, with production facilities in Trinidad and Tobago, the US and Oman and ongoing expansion into Mexico, Canada and the UAE.

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NGC and NewGen sign Heads of Agreement to deepen hydrogen partnership

Staff Writer | Energy Chamber

Trinidad and Tobago steps closer to developing a hydrogen economy with the newest agreement signed between NGC and NewGen. It was recently announced that The National Gas Company of Trinidad and Tobago Limited (NGC) and NewGen Energy Limited (NewGen) signed a non-binding Heads of Agreement (HOA), which outlines the framework for the establishment of Binding Definitive Agreements between the relevant parties, once acceptable terms can be reached.

This deepens their partnership to cooperate on the enabling of a sustainable hydrogen economy for the energy sector of Trinidad and Tobago.

The HOA follows the signing of a Letter of Intent in May 2022, which expressed NGC's intention to work collaboratively with NewGen to further evaluate the development of NewGen's hydrogen production facility. This evaluation has rapidly progressed, and the signing of this HOA includes the commitment from NGC and NewGen to jointly establish working teams that will now engage key related public and private stakeholders in this ground-breaking project development of a cleaner energy supply for Trinidad and Tobago.

The HOA is a further milestone that advances the country's transition to a lower carbon future through low-carbon and green hydrogen production. It is the next key step in the progression of the development of the US$250 million NewGen hydrogen production facility in Point Lisas.

Noting the significance of the HOA, NGC President Mark Loquan commented, "The NGC Group has been progressively demonstrating its commitment to lead the energy sector of Trinidad and Tobago into the new energy future. NGC is committed to collaborating with NewGen and all critical stakeholders in developing a low carbon future. We are well positioned to support the country's pursuit of a greener hydrogen economy, in a similar role that NGC played in the establishment of T&T's existing world-class hydrogen economy with natural gas. Agreements such as this HOA with NewGen Energy, coupled with the right partnerships, frameworks, and policies, has the ability to launch Trinidad and Tobago into a position of global leadership in clean energy."

"NewGen is delighted that our partnership with NGC continues to progress apace," said Philip Julien, Chairman of NewGen. "We are confident that our continued collaboration with NGC will lead to a further acceleration of the provision of Greener Hydrogen to Trinidad and Tobago, and that the NewGen Project is advanced towards a final investment decision consideration as soon as possible. We look forward to engaging with NGC and all relevant stakeholders, as we collectively contribute to the transition and decarbonisation of Trinidad and Tobago's energy sector."

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ESG Matters

Professor Sterling Frost | Contributor

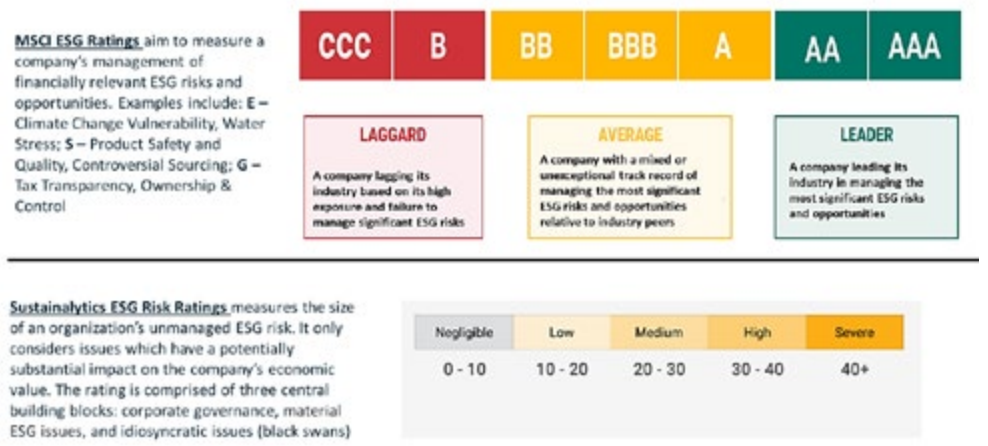

Figure 3 - ESG Risk Ratings - Sources: https://www.sustainalytics.com/corporate-solutions/esg-risk-ratings, https://www.msci.com/our-solutions/esg-investing/esg-ratings

ESG (Environmental, Social and Corporate Governance) is a framework for sustainable and socially responsible investing. It defines a set of criteria, metrics and standards that allow investors to evaluate and compare companies' maximisation of stakeholder value beyond shareholder dividends. The E speaks to a company's efficient use of energy, waste and carbon footprint produced, and the consequences of all of the aforementioned on the ecosystem of living things. The S addresses a company's relationship with the communities it touches, focusing on socioeconomic development, diversity and inclusiveness. G speaks to a company's internal systems and procedures that ensure optimal decision making, compliance with regulations and laws, transparency and accountability to stakeholders, independence from political interference, and avoidance of conflicts of interest. ESG, although decades old, has been gaining momentum in recent years driven by stakeholder lobbying and attitudes towards sustainability, quantum shifts in regulatory development, climate change policy, and the COVID-19 pandemic's exacerbation of social and economic inequalities. This article will provide an overview of ESG and its applications, examine some criticisms and pitfalls of ESG, discuss its relevance to Trinidad and Tobago (T&T); and suggest how to adapt ESG in the local context.

Frameworks and Application of ESG

Several research and rating agencies, industries and regulators are currently working towards standards for ESG (e.g., technology, disclosure, data provision and methodologies), however, no known party provides a complete view of its domain. One of the more popular reference frameworks adapts and leverages the UN's (SDGs) Sustainable Development Goals as outlined in figure 1:

The three pillars of ESG are intertwined, they reinforce each other and are linked under the umbrella of responsible investment. For example, Standards and Poor (S&P global rating agency) offer ESG indexing which allows investors to assess and compare *ESG performance* of companies. These indices focus on financially material and industry-specific sustainability issues with a link to long-term *financial performance*. These indices are based on the S&P Global Corporate Sustainability Assessment (CSA). According to S&P, the scores *contain a total company-level ESG score for a financial period, comprising individual environmental (E), social (S), and economic and governance (G) dimension scores, beneath which there are on average 21 industry-specific criteria scores that can be used as specific ESG signals. The criteria scores are weighted to eliminate biases among different industries* (see figure 2 for criteria).

Standards & Poor's Global Corporate Sustainability Assessment		
Environmental	**Social**	**Corporate Governance**
• Environmental Reporting • Environmental Policy & Management Systems • Operational Eco-Efficiency • Climate Strategy • Genetically Modified Organisms • Packaging • Raw Material Sourcing • Water Related Risks	• Social Reporting • Labor Practice Indicators • Human Rights • Human Capital Development • Talent Attraction and Retention • Corporate Citizenship & Philanthropy • Occupational Health & Safety	• Corporate Governance • Materiality • Risk and Crisis Management • Codes of Business Conduct • Customer Relationship Management • Policy Influence • Supply Chain Management • Tax Strategy • Information Security / Cyber Security & System Availability • Innovation Management • Health & Nutrition • Strategy for Emerging Markets

Figure 2 – Global Corporate Sustainability Assessment - S&P Global (2021)

Another form of ESG ratings speak to *ESG risks*, i.e., deficiencies in a company's ESG management which can lead to increased operational costs, litigation, controversy and other outcomes that affect the company's bottom line. For example, MSCI, a leading ESG risk rating provider, illustrates how water sustainability can affect risk exposure for a mining company but perhaps not a financial service provider; whilst the latter may be affected by cyber-security in a more material way. Figure 3 illustrates a comparison of the top ESG Risk Ratings.

Experts argue that ESG plays a critical role in enterprises' long-term financial resilience and performance so it allows for investors to optimise between financial ROI and sustainability interests. McKinsey proffers five links between ESG and value creation as follows:- 1) Top-line Growth: ESG is a driver for tapping into new markets and expanding on existing ones by way of new projects and expanded social capital; 2) Cost Reduction: less energy intensive production and lean initiatives can significantly reduce carbon footprint and waste; 3) Reduced regulatory and legal interventions: a strong value proposition as well as, corporate governance can help to avoid attention and fines from regulators; 4) Employee productivity uplift: ESG can attract, retain and engage employees toward productivity; and 5) Investment and asset optimisation: linking ESG risk, ESG performance and financial performance. ESG enhanced investment portfolios can avoid write-offs due to environmental issues and optimise on more sustainable and long lasting investments.

Criticisms and Inconvenient Truths

Bloomberg Intelligence (BI) estimates that ESG assets surpassed thirty-five trillion (US) dollars globally in 2020 and could surpass forty-one trillion in 2022. However, BI cautions that the traction ESG is gaining in becoming mainstream or even mandatory in some jurisdictions can give rise to "greenwashing" due to the lack of regulations. Greenwashing refers to false or exaggerated claims about the sustainability and social responsibleness of an organisation's operations, products and services in order to appear more attractive to investors and political groups. In so doing, one can question whether the aforementioned traction is being driven primarily by actual ESG performance or pure economic incentive. Critics of the ESG trend, point to the economic inefficiency of ESG via neoclassical economic theory of the late Milton Friedman. Friedman proffers that socially responsible corporate expenditures are mostly non-essential expenses that erode shareholders profits. He advocates shareholder maximisation while staying within the rules of the game. While Friedman's ideas remain controversial, rational economic agents will always seek to maximise shareholder value. Perhaps the enforcement of ESG lends to conflict of interest and the unintended consequences of greenwashing? These conflicts of interest then ironically erode the third ESG pillar—corporate governance.

Friedman's view may be backed by a recent Journal of Finance article Do Investors Value Sustainability A Natural Experiment Examining Ranking and Fund Flows (Hartzmark and Sussman, 2019), referenced in the Harvard Business Review (HBR); where University of Chicago researchers found that even though highest ESG rated funds attracted more capital than the lowest rated, none of the highest rated outperformed the lowest ESG rated funds. In other words, contrary to McKinsey above, ESG was not linked to better financial performance. Furthermore, ESG may be redundant and may even distort decision making as shareholders' interests maximisation implies that, under the assumption of competitive markets, companies ought to already be paying attention to risk management, employee engagement, customer satisfaction, community and the rules of the game set out by regulators and law makers. A 2021 Price Waterhouse Coopers (PwC) paper highlights that there is "no free lunch", i.e., the recognition of tradeoffs, with 75% surveyed indicating they were willing to sacrifice short term profitability (to a small degree) to address sustainability in the long-term. Ironically though, according the HBR analysis, it was not the case that ESG funding actually delivered better ESG performance.

ESG Trinidad

In the PwC T&T 2022 Corporate Governance Survey report (47 directors from local private and public sector organisations) revealed that 21% of T&T Boards have defined processes for ESG oversight, which is poor compared to 69% in the USA's 2021 Corporate Directors survey which indicates that the latter has adequately defined processes. However, 60% of T&T respondents indicate that ESG issues are linked to their corporate strategy which is comparable to the USA at 64%. T&T's performance in these surveys are not necessarily bad as the size and maturity of a corporation may be a main driver for ESG feasibility. This is evidenced by the PwC 2021 USA survey findings of a large variance in ESG focus (e.g., Board Agenda and Strategy) based on the size of the corporation (see figure 4).

United Nations Sustainable Development Goals mapped to ESG		
Environmental	**Social**	**Corporate Governance**
• SDG 6 – Clean Water and Sanitation • SDG 7 – Affordable and Clean Energy • SDG 9 - Industry, Innovation and Infrastructure • SDG 11 – Sustainable Cities and Communities • SDG 12 – Responsible Consumption and Production • SDG 13 – Climate Action • SDG 14 – Life Below Water • SDG 15 – Life on Land	• SDG 1 – No Poverty • SDG 2 – Zero Hunger • SDG 3 – Good Health and Well Being • SDG 4 – Quality Education • SDG 5 – Gender Equality • SDG 6 – Clean Water and Sanitation • SDG 8 – Decent Work and Economic Growth • SDG 9 – Industry, Innovation and Infrastructure • SDG 10 – Reduced Inequalities • SDG 12 – Responsible Consumption and Production • SDG 16 – Peace, Justice and Strong Institutions	• SDG 5 – Gender Equality • SDG 8 – Decent Work and Economic Growth • SDG 9 – Industry, Innovation and Infrastructure • SDG 11 – Sustainable Cities and Communities • SDG 12 – Responsible Consumption and Production • SDG 13 - Climate Action • SDG 16 – Peace, Justice and Strong Institutions • SDG 17 – Partnerships for the Goals

Figure 1 – SDG based ESG Framework - Source: Berenberg (2018)

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Having outlined all of the above, the author now raises the question of should, and/or, to what extent could ESG ratings and disclosure regulations be applied in T&T with its much smaller corporations? T&T already has defined rules of the game, e.g., codes, regulations and Acts pertaining to waste management, environmental management, industrial relations and corporate governance. However, with respect to corruption and enforcement, T&T ranks poorly (compared to ESG focused countries) on the World Bank's Worldwide Governance Indicators. For example, T&T ranks in the 50th percentile for Control of Corruption, whereas ESG-focused countries such as the USA and Finland rank in the 82nd and 99th percentiles respectively. Therefore, it may be premature to align to global ESG performance and risk ratings and disclosure requirements as T&T may descend into a culture of greenwashing. Moreover, major social benefits can still be derived from stronger enforcement of existing laws and regulations.

Figure 4 - Source: PwC, 2021 Annual Corporate Directors Survey, October 2021.

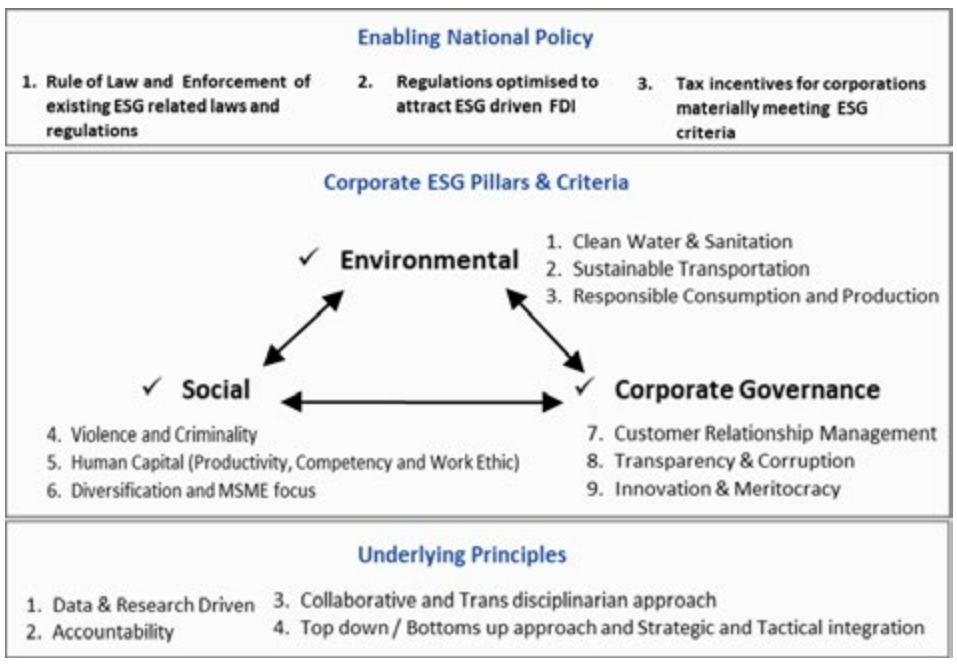

Figure 5 - A More Focused and Enabling approach to ESG for T&T

A Starting Point

There are pitfalls to ESG, as well as, questions about its feasibility for smaller developing markets like T&T. Nonetheless, ESG does matter if we desire a sustainable future. Hopefully the recognition of these issues provides the impetus for optimising how ESG is executed. Moreover, locally one must be focused on how ESG is framed, as there are certain developmental issues to transcend before aligning to more complex and far-reaching standards. Juxtaposing the National Development Strategy (Vision 2030) and the post COVID-19 Road to Recovery objectives with the UN SDGs can distill a more tenable framework as outlined in figure 5 below.

The above model outlines nine ESG levers that T&T's academia, private sector and government should pull collectively. The nine ESG criteria hone the main issues that are either currently plaguing T&T or will generally make it more competitive and sustainable in the long term. These nine criteria are inextricably linked, for example, diversification will be enhanced by sustainable transportation; or responsible production and consumption can open up green opportunities for new MSMEs. The criteria provide more focus and yet systemically solve other ESG matters not explicitly included. An example of this is the total effect on the national culture needed for sustainability via a combined focus on how we treat customers, work ethic and corruption. These ESG criteria are primarily aimed at evaluating corporations' contribution to T&T's ESG agenda, however government may consider enabling these contributions with the requisite support of national policy. The ESG criteria should translate into transparent and quantifiable measures that the state can use to incentivise companies, avoiding the greenwashing paradox and stakeholder conflicts of interest. Moreover, the state's role is to enforce the existing rules of the game in an equitable manner while seeking out enhancements in the regulatory framework that attract FDI but are also feasible for local industry. Lastly, all stakeholders contributing and subscribing to this ESG framework ought to be committed to and united by some core underlying principles that help negate the pitfalls of ESG. Accountabilities for ESG and fostering a research and data driven approach to ESG decision making and performance management help to clarify cause and effect relationships amongst ESG actions, ESG performance and financial performance. A collaborative and trans-disciplinarian approach ensure that stakeholders across organisational boundaries are on the same page, providing further scrutiny, expertise and systemic wide solutions. Strategic and tactical integration ensures that stakeholders contribute to and see meaning in what they do on a daily basis in the context of a sustainable vision.

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Emerging role of blue and green ammonia in decarbonisation

Dr. Ruby Ray | Contributor

Over the last few years, the role of ammonia has evolved from being a key ingredient in the fertiliser industry and global food value chain, to a carbon-neutral transportable and dispatchable form of energy.

The projected worldwide population growth of two billion people by 2050 will mean demand for fertilisers will grow, but global carbon reduction targets will mean that production methods will themselves have to be decarbonised.

The war in Ukraine is putting further demand on the production of ammonia as Russia is a key exporter of fertilisers. Export sanctions are now forcing countries to plan new routes of supply. The clear roadmap is that this will increase demands for new fertiliser production in countries that previously imported and now strategically require local production. This scenario will also accelerate the need for expansion of hydrogen production technology, which is key ingredient of ammonia.

Ammonia is also now seen as a carrier and supplier of hydrogen energy due to its nearly three times higher volumetric energy density (i.e. its ability to deliver energy) and its relative ease of storage at a much less energy-intensive –33°C compared to –253°C for liquid hydrogen. Another advantage is that ammonia movement can utilise existing well-established supply chains and infrastructure that have been available and proven for decades.

A century in the making

The core ammonia production process is still Haber-Bosch synthesis, a process developed over one hundred years ago in the first decade of the 20th century, which combines nitrogen with hydrogen to produce ammonia, helped by iron as the catalyst.

The production of one of the two key components; hydrogen can make the ammonia "grey", "blue" or "green" depending on the feedstock and production process. Blue low-carbon ammonia is essentially like conventional grey ammonia coupled with carbon capture, which can reduce its carbon emissions by more than 90%. Green ammonia uses green hydrogen produced by water electrolysis, powered by renewable energy, making green ammonia production virtually carbon dioxide-free.

Industries and countries committed to net-zero are moving towards blue and green ammonia as they emerge as strong candidates for long-term energy carriers, vectors providing a route for greenhouse gas emissions reduction as low- or zero-carbon fuels. For example, Japan is focussed on testing cofiring ammonia in coal-based power plants with the aim of converting entirely to ammonia in the future.

Market opportunity

The market for blue and green ammonia is huge and according to the IEA, ammonia demand will grow by 25% by 2050. Consequently, Wood is involved in several studies and projects on blue and green ammonia and increasingly we are seeing lots of interest among our clients. We are working with ADNOC on the development of a world-scale

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Emerging role of blue and green ammonia in decarbonisation

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blue ammonia production facility in Ruwais, Abu Dhabi. We are also supporting Horisont Energi with a broad suite of services under a framework agreement that covers the Barents Blue project, Europe's first large-scale production facility for blue ammonia. Plus, on the green side we are involved in Total Eren's Magallanes project in Chile, where our knowledge will help to support the production of ammonia from green hydrogen at one of the largest such projects in the world.

Intense research and development is focussing on other uses for ammonia, establishing use of ammonia as fuel for internal combustion engines (vehicle engines), marine bunker fuel, fuel to gas turbines for power generators, direct ammonia fuel cells and also an advanced class gas turbine that is fuelled by 100% ammonia. Fertiliser companies are also gearing up towards blue and green ammonia manufacturing. Several large projects were announced last year, such as the first big green ammonia project in the US that will convert 20,000 tonnes per annum of conventional grey ammonia to green by installing electrolysers.

Green ammonia projects are at present on a more modest scale since they are limited by electrolyser capacity and thus an order of magnitude smaller than a typical grey ammonia plant. By contrast, blue ammonia scale will be comparable to grey ammonia since it requires only retrofit of CO_2 capture, already demonstrated at the required scale. Wood has supported a client with their steam methane reformer (SMR) to support ammonia production where they are separately importing a percentage of green H_2. Green H_2 cannot replace the grey but the offset means new operating conditions for SMR need to be considered. It is worth noticing that Wood's next generation of SMR technology can achieve 95% CO_2 emissions reduction, compared to a traditional hydrogen production plant. The technology, applicable for both greenfield and brownfield projects, will reduce CAPEX and OPEX for operators while improving the environmental footprint and efficiency.

Ammonia will play a critical role in food security and the energy transition as part of a sustainable long-term energy mix given its many potential applications. Wood is perfectly placed to be part of the blue and green ammonia market, helping clients to shape and achieve their targets towards net-zero. Critical to achieve blue or green ammonia are carbon capture and storage (CCS) and green H_2 from electrolysis respectively. As this technology develops, we aim to provide our wealth of knowledge on CCS and hydrogen to help shape the future for the production and use of ammonia.

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The Ukraine war will not derail Europe's energy transition

Sverre Alvik | Contributor

As Europe struggles to build energy security in response to Russia's invasion of Ukraine, uncertainty looms on many fronts. By turning its back on Russian oil and gas, will Europe speed or slow down its response to the more global crisis—climate change?

That is a complicated question, and hinges on the extent and duration of the war. But, as things stand, our conclusion is that improved energy security does not come at the cost of decarbonisation and there is likely to be a small acceleration in Europe's energy transition.

This feature outlines DNV's provisional view on how the ongoing war is likely to impact Europe's energy transition in the short-, medium-, and long-term.

Our emphasis here is on the consequences of unfolding developments and not on making policy recommendations. The present commentary is confined to the implications of current developments in Europe.

Elsewhere, in our Pathway to Net Zero Emissions (DNV, 2021), DNV sets out what we believe to be a feasible way for the world to achieve the Paris ambitions. The results from DNV's energy transition model underpin the conclusions we present here, but we underline the uncertainty in the quantification. We also acknowledge that the small acceleration of progress towards the Paris Agreement in a geographically limited part of the world, comes at the cost of a profound humanitarian crisis.

Energy security

Roughly one third of European gas demand is used for buildings' heating and cooking, and another third for electricity production. Almost twenty percent is used by the manufacturing industry, and the remainder in the petrochemical industry and by the gas industry itself during production.

European policymakers are determined to slash the EU's Russian gas dependence by two-thirds this year. The replacement will be painful and costly, with increased import of LNG taking centre stage.

However, there is currently insufficient regasification capacity in Europe, and production in places linked to the European gas pipeline networks in Norway, Algeria and Azerbaijan can only inch their output upwards. Replacing two-thirds of Russian gas by year-end looks like a tall order, and the European energy security ambition therefore hinges on additional policies, such as those outlined by the IEA in its 10-point plan (IEA, 2022). Beyond nudging consumer behaviour towards lower energy use, there is scope for a concerted policy push for energy efficiency, a postponement of nuclear retirements, and an extensive renewable energy buildout.

There is certainly opportunity for acceleration on these fronts: Belgian nuclear, French heat pumps, German solar and pan-European wind will all contribute to a lower dependence on imported Russian energy. Some of these options can make a difference this year; others will need multiple years to take meaningful effect.

While non-fossil supply and energy efficiency can and will be accelerated, there are counterforces at work with respect to the energy transition. These include burning more coal to replace natural gas and increasing costs of EV batteries and PV panels. To this extent, the push for energy security works against the transition.

Beyond nudging consumer behaviour towards lower energy use, there is scope for a concerted policy push for energy efficiency, a postponement of nuclear retirements, and an extensive renewable energy buildout: Belgian nuclear, French heat pumps, German solar and pan-European wind will all contribute to a lower dependence on imported Russian energy.

Other effects of the war that are not linked to energy security, like reduced global trade and cooperation, such as the realignment of global logistics to address a mounting food crisis, and a shortfall of critical minerals, could also slow down the energy transition.

Modelling the transition

The next edition of our annual Energy Transition Outlook is due in October, but we have run the model now to assess how the changes we have seen since 24th February this year are likely to influence the energy transition in Europe.

The largest uncertainties have to do with the war itself, its duration and possible escalation, and whether strengthened countermeasures bring the export of Russian oil and gas to Europe to complete stop. While it is likely that Europe's commitment to its "Fit for 55" climate plan will endure, public reaction to energy affordability may challenge its momentum in the short-term. There are many other imponderables, like whether the war will give rise to a new cold war, or end in a calmer détente.

With all these uncertainties in mind, we have chosen to model a scenario where the European energy system discontinues the importation of Russian gas, with zero Russian gas imported from 2025 onwards.

Higher energy prices

Russia produces about 17% of global natural gas, and imports from Russia met 33% of Europe's overall natural gas consumption in 2020. When we let our model choke Russian gas supply to Europe by 80% in 2023 and 100% in 2025, and factor in the higher gas prices that result, we see a spillover to other areas, like electricity prices.

For example, for 2024, the electricity price is 12% higher than a model run with no change in Russian energy import. Globally, the war leads to 3% lower energy demand within two years, compared with our pre-war model run, mainly because of lower GDP.

Alternatives to gas

Ease and means of gas replacement depend on which sector it is used. Growth and greening of electricity, and hence the decarbonisation of end uses in the transport, building and manufacturing sectors, are the most important means to decarbonise European energy use. Renewables and nuclear have low operating costs and are at the top of a cost merit order in our analysis, producing whatever quantities available. These quantities are not sufficient in the short-term to cope with the entire shortfall in gas—that is when gas needs to be replaced by coal, which also has higher costs as a result of the war. The switch to coal is temporary. Being the fuel of the last resort, we find that by 2024 only 6% of the reduction in natural gas use will be taken up by coal.

The postponement of nuclear retirements and higher utilisation of existing nuclear assets together produce an important short-term effect, and these developments are likely to happen in several countries, but notably not Germany. Nuclear production makes up for one-third of the shortfall in Russian gas in 2023.

Unlike most other energy sources, bioenergy costs have not grown due to the war, and it is possible to grow bioenergy—mainly from sewage and wastefills—slightly over the coming few years. We find bioenergy makes up for 20 % of the shortfall in Russian gas in 2024.

By contrast, the main energy independence measure advanced by European politicians—a bigger and faster renewable energy buildout—has a much slower initial effect. It will take two years, for example, for this faster buildout to make up 10% of the shortfall resulting from an absence of Russian gas. However, while there may be a small impact in 2023, it becomes more meaningful with each passing year. Over a five-year period, we see the renewable buildout matching the 20% increase the EU aims for, and by 2030, solar PV and wind will make up for more than half of the shortfall in natural gas supply.

Higher commodity prices will inflate battery costs. EV uptake will suffer, such that the timing of the milestone where 50% of new car sales in Europe occurs is delayed by almost one year—2028 rather than 2027. This has further implications for long-term decarbonisation and delays the decline in oil somewhat. Countries with ambitious 2030 decarbonisation targets will need to review and possibly strengthen incentives for EV uptake.

If we look at percentage changes, overall gas use is down 1700 PJ or 9% in 2024 compared with our pre-war model run. The biggest percentage increase is in solar, which

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As things currently stand, we forecast a small acceleration of the energy transition in Europe as the most likely energy-related outcome of the Ukraine war. As with COVID-19, we see a Europe that manages to cope with a short-term crisis without harming its ability to deal with the long-term climate crisis.
At a global level, the net effect of the war on the energy transition is minor.

is up 9%. The overall effect on the energy mix is limited, bearing in mind Europe's overall primary energy demand is 70 EJ or 70,000 PJ. As a result of the decline in gas, the decarbonisation of the energy mix increases to 34% non-fossil energy sources in 2024, 2% higher than our pre-war model run. This small acceleration endures, such that by 2030, the overall change in the share of non-fossil energy sources in the energy mix continues to be 2% higher than the pre-war prediction.

Nothing has lower costs and footprint than the energy not used, and Europe is putting more effort into energy efficiency to ensure energy independence. The standout action here is support for heat pumps, and, as a result, we expect the overall energy demand in the building sector to improve a further 4% towards 2030, with efficient electricity use for heat pumps replacing some of the gas.

(Green) hydrogen push

Hydrogen is an(other) important pillar in securing both Europe's energy independence and the sustainability of its energy mix. But its main challenge is affordability.

There are signals from Germany that the energy crisis is reducing the opposition towards blue hydrogen (Recharge, 2022). However, when Europe is in dire need of gas to replace the phase-out of Russian gas, it is unlikely that significant amounts of surplus natural gas will be available for producing blue hydrogen. Furthermore, gas prices are high, and that makes blue hydrogen, with its additional carbon sequestration and storage costs, less competitive. Even if blue hydrogen remains cheaper than green hydrogen (produced from renewables by electrolysis) for the next few years, we find blue hydrogen uptake low in Europe towards 2030 and decreasing rather than increasing as a consequence of the war.

Europe has limited capacity for producing sufficient renewable electricity to simultaneously phase out fossil fuels from the power mix and produce meaningful amounts of green hydrogen. Nevertheless, policymakers continue to prioritise both objectives. Consequently, we anticipate higher support for green hydrogen as part of the new push for renewables and have factored a 12% lower hydrogen price into our model, compared with our base case for 2030. In spite of increased support, green hydrogen use in Europe will remain modest by 2030, albeit 25% higher compared with our pre-war model output.

Gas demand shifts

Russia will be looking to the East to replace its energy export revenue, but export capacity to China and neighbours is currently limited and new transmission pipelines and LNG export terminals take a long time to build. Hence, we find that gas production in North East Eurasia, which includes Russia, Ukraine and other former Soviet Union countries, will decline by 24% in 2024, as there is not sufficient infrastructure to export the gas.

In contrast, we estimate that Europe itself will produce 12% more gas between now and 2030, reflecting the industry's reaction to higher oil and gas prices in the short term and responses to the pledge from EU to deliver more gas. High oil and gas prices will stimulate new developments globally, but in the wake of this initial rush to new production, over the next decade global demand will likely reduce rather than increase, as GDP growth and globalisation reduce, and both oil and gas production and transport hence inch a little lower.

Thus, we anticipate that over-investments will result in lower oil and gas prices in the second half of this decade and our model suggests that this will lead to a small increase in global oil use later in the 2030s relative to our pre-war forecast.

A small acceleration of decarbonisation and emission reduction

The ultimate metric for decarbonisation is reduction in GHG emissions, and the net effect of the invasion in Ukraine will be a small acceleration of decarbonisation and emissions reduction towards 2030. The main reasons for the difference are postponed nuclear retirements in the short term and, in the medium term, a faster renewables buildout, and increased energy efficiency and lower economic growth.

The overall effect is, however, limited, amounting to a 580Mt or 2.3% reduction in emissions in Europe in the period 2022-2030, compared with a case without a Ukraine war. In Figure 2, we show that the total emissions change is almost entirely due to reduced gas consumption; the changes in the other energy sources and in carbon capture and storage (CCS) are minor in comparison.

We emphasize that there are significant uncertainties in our forecast. These relate primarily to the duration and outcome of the war itself, and the strength duration of the policy measures enforced by the European nations to improve energy security and sustainability.

However, as things currently stand, we forecast a small acceleration of the energy transition in Europe as the most likely energy-related outcome of the Ukraine war. As with COVID-19, we see a Europe that manages to cope with a short-term crisis without harming its ability to deal with the long-term climate crisis.

At a global level, the net effect of the war on the energy transition is minor. The DNV system dynamics model captures some of the emerging global complexities, including changes in energy trade and the effect of increased commodity prices. It also takes account of how regionalisation and energy security boost more short-term coal use in e.g. China, and how the renewables buildout is slowed down by higher commodity prices and at the same time accelerated by the push for energy independence.

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renewables

CEMEX adds CNG and RNG to fleet to reduce roadside emissions

CEMEX Truck

Staff Writer | Energy Chamber

Internationally, CEMEX has announced that it has added nearly 200 lower-carbon natural gas-powered trucks as part of a comprehensive strategy seeking to decarbonise its global fleet. This initiative is part of the company's flagship Future in Action programme to become a net-zero CO_2 company by 2050.

The investment in these 200 new vehicles consists mostly of concrete mixer trucks powered by low emission compressed natural gas (CNG) or renewable natural gas (RNG). These trucks will have a carbon footprint that is approximately 25% lower than the diesel trucks they are replacing. Over half of the vehicles are in Mexico, with the remaining half split between Southern California in the U.S. and Colombia.

"Decarbonising our global fleet requires a multi-pronged approach built on innovation," said Juan Romero, CEMEX Executive Vice President of Sustainability, Commercial and Operations Development. "Our strategy combines taking immediate action to reduce our carbon footprint with currently available state-of-the-art technology, while at the same time collaborating with our partners to discover, pilot, and scale the solutions needed to achieve net-zero."

Overall, CEMEX has an ambitious 2030 Scope 3 goal to reduce transport carbon emissions by 20% and is committed to reaching overall net-zero emissions by 2050. Scope 3 emissions are indirect emissions, including those from upstream and downstream transportation and distribution.

Natural gas-powered trucks are a transitional technology that will permit an immediate reduction of carbon emissions. Natural gas, biodiesel and hybrid power are the most readily available lower-carbon transition technologies.

CEMEX is a founding member of the First Movers Coalition, which brings together business leaders with global footprints to create market demand for zero carbon solutions in this decade and jump-start the scaling of these emerging technologies. The company committed to making approximately 30% of its heavy-duty transport purchases zero-emissions by 2030. To that end, CEMEX has completed a multi-country pilot using fully electric ready-mix concrete trucks. Fully electric heavy-duty trucks are not yet available at scale, but CEMEX is collaborating with several original equipment manufacturers on new transportation technology that will enable a net-zero emissions future. CEMEX expects to gradually continue introducing and testing new prototypes for zero-emission ready-mix concrete trucks to its fleet.

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RYSTAD: Global offshore wind capital expenditure to more than double, top $100 billion in 2030

Offshore wind farm

Staff Writer | Energy Chamber

Installations and investments in the global offshore wind industry are set to surge this decade as nations seek to transition to cleaner sources of energy, with total capital expenditure projected to more than double from $46 billion in 2021 to $102 billion in 2030, Rystad Energy research shows.

Driving this growth is a significant uptick in capacity installations in Europe, solidifying the region's place as the global leader in the offshore wind space. Capital expenditure in Europe in 2030 is forecast to approach $53 billion, up from $15 billion last year. The Americas have been slow to enter the offshore wind market, but that looks set to change from this year onwards. The region is projected to spend $3.3 billion this year, up from $700 million last year, and rise further to almost $15 billion by 2030.

China has been a major player in the offshore wind market to date, but the powerhouse's investments are set to slow as we approach the 2030s. In 2020, China invested almost $25 billion, double what Europe spent in that year, but the country's total expenditure is forecast to gradually decline to a comparatively small $7.7 billion in 2030. This is due to feed-in tariffs, which encouraged infrastructure investments being phased out in 2021, along with emerging market dynamics that will result in lower costs for any new capacity additions in the region.

"The offshore wind industry is set for substantial growth this decade, with over 265 gigawatts of operational capacity expected by 2030. As the world moves towards a greener energy mix, investments in the offshore wind sector are set to soar and provide ample opportunities for suppliers to cash in," says Anubhav Venkatesh, offshore wind analyst with Rystad Energy.

Of the billions of dollars of capital expenditure that developers are lining up for projects, more than 50% will go towards the manufacturing and installation of turbines and foundations, the two largest financial components of an offshore wind farm. While some players were early movers and now enjoy a competitive advantage, new companies are entering the market. With high ambitions for offshore wind in the US and Asia, excluding China, new offshore wind projects will emerge through to 2035 as auctions pick up in these regions.

The European region was an early mover in the offshore wind space and currently leads the world with the largest number of installations. With over 26 GW of operational capacity, it represents more than 50% of the global total. Europe is expected to have an installed base of over 57 GW by 2026 when Danish giant Orsted is expected to remain the region's leading offshore wind developer.

Over 8,500 turbines are expected to be operational in Europe by end-2026, of which almost 60% are likely to be Siemens Gamesa units. Rival Vestas is expected to be the second-most successful turbine manufacturer by end-2026, contributing to around 20% of the forecast installed base.

Asia, excluding China, and the US, relatively new regions to the offshore wind market, are expected to commission their first large-scale projects in 2022 and 2024, respectively. The US is set for a wave of project commissioning towards 2030, as it targets 30 GW of operational offshore wind capacity, although the country is likely to fall short and install only around 21 GW. The Biden-Harris Administration has accelerated lease sales in the US, with eight leases being sold so far this year, with the Final Sale Notice (FSN) for another five released towards the end of May.

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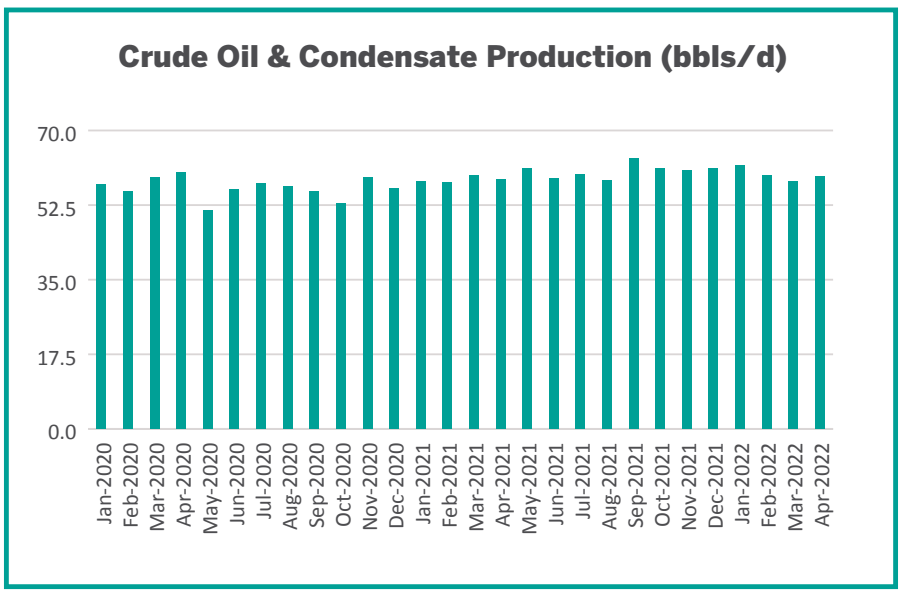
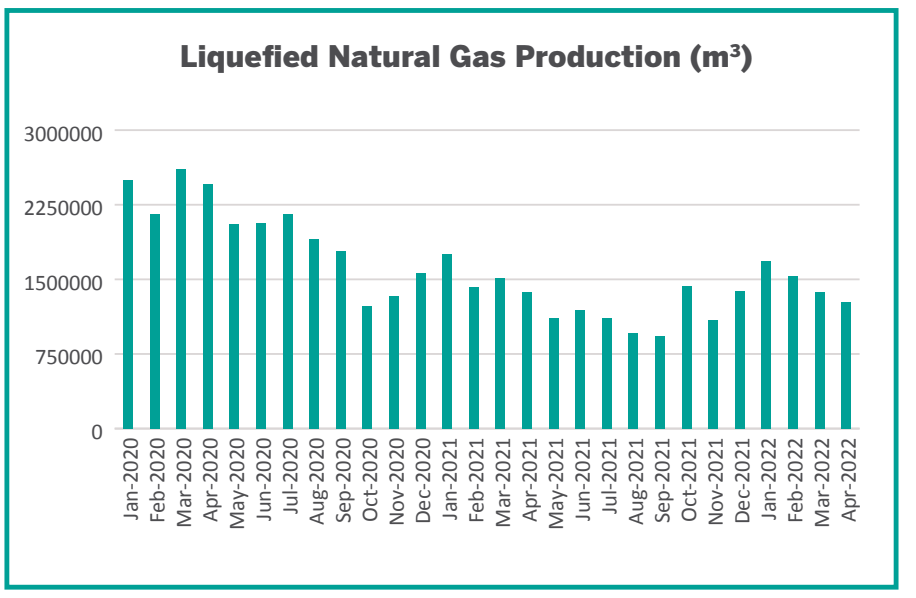
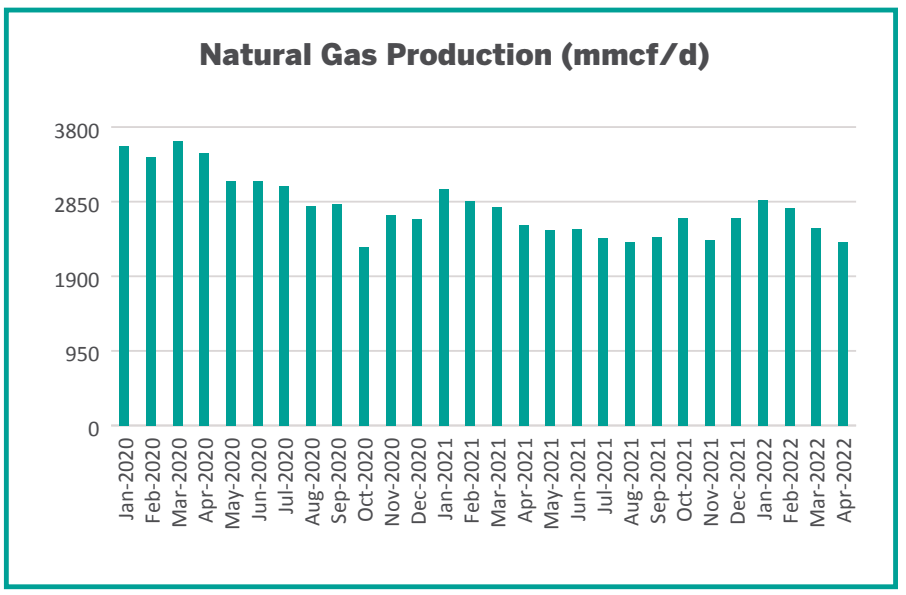
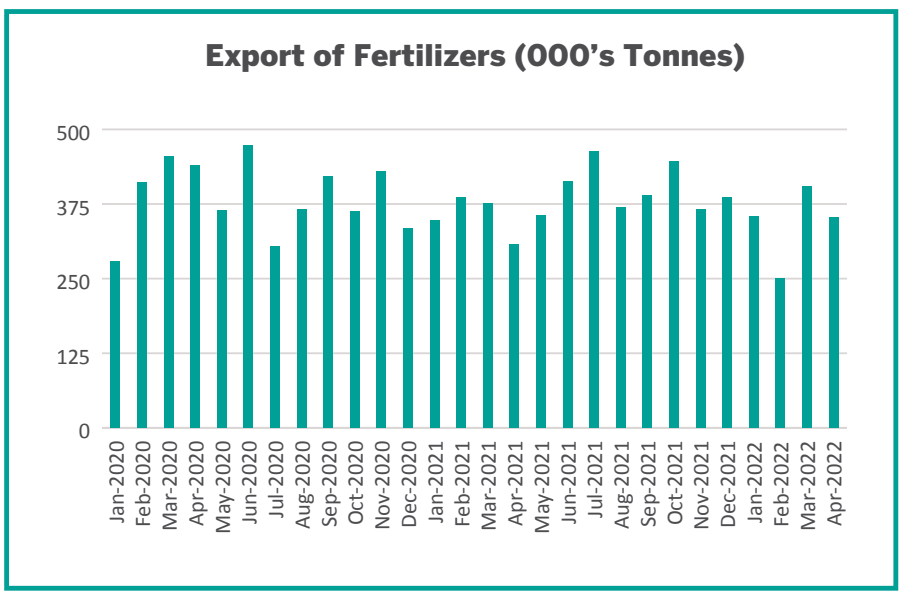
energy update

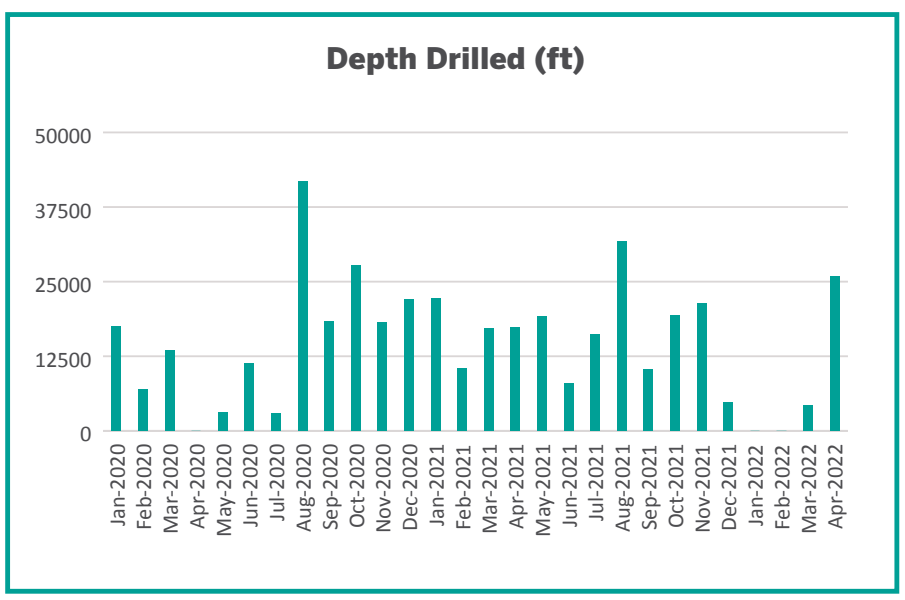
Monthly Review

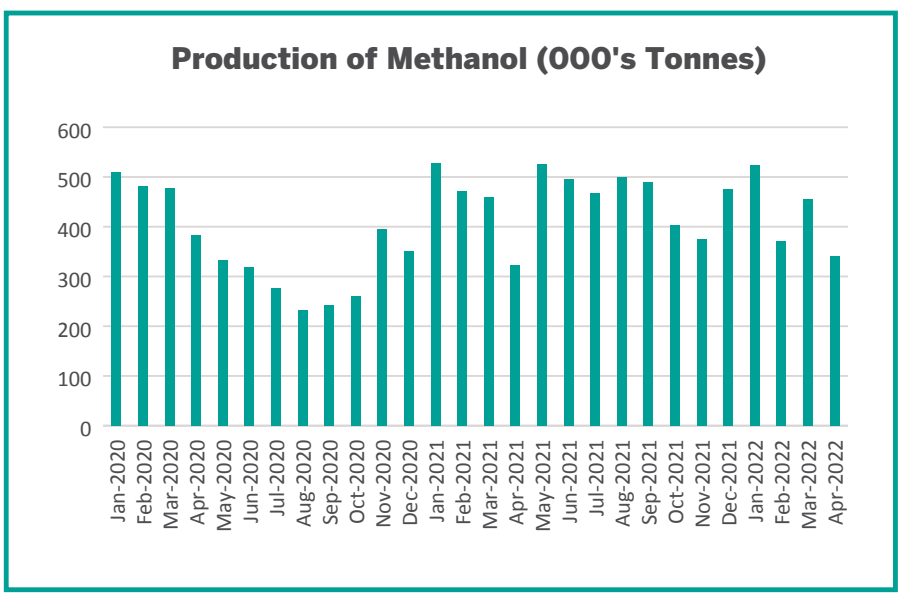


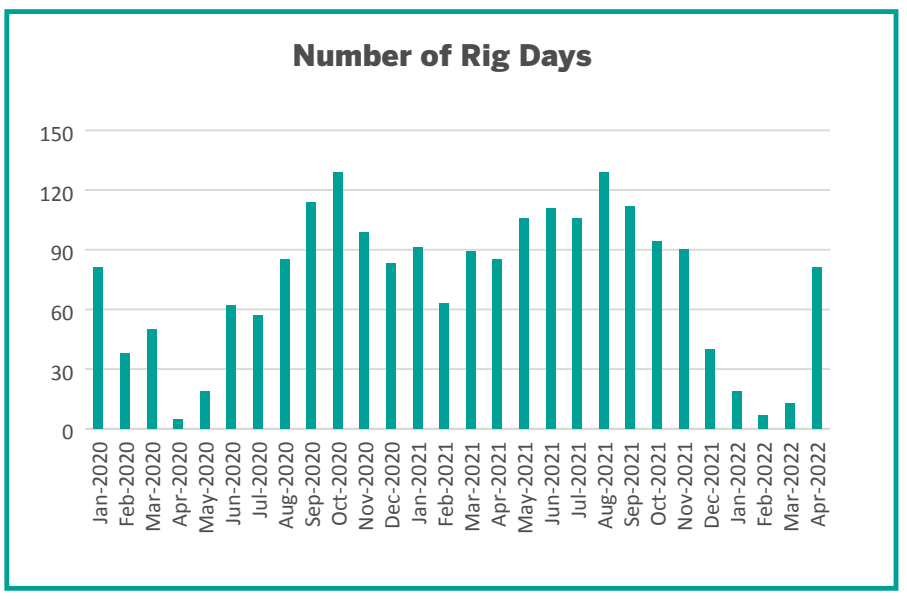


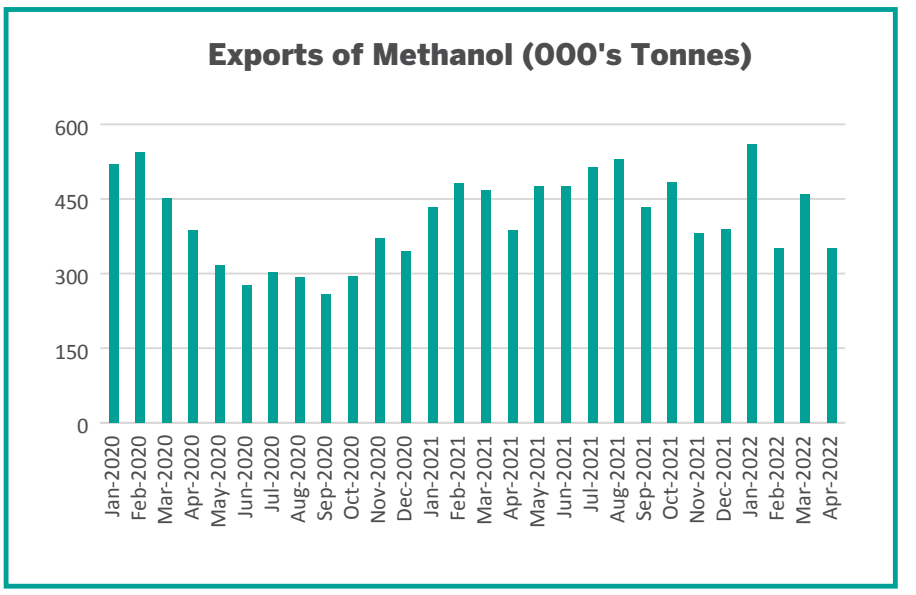












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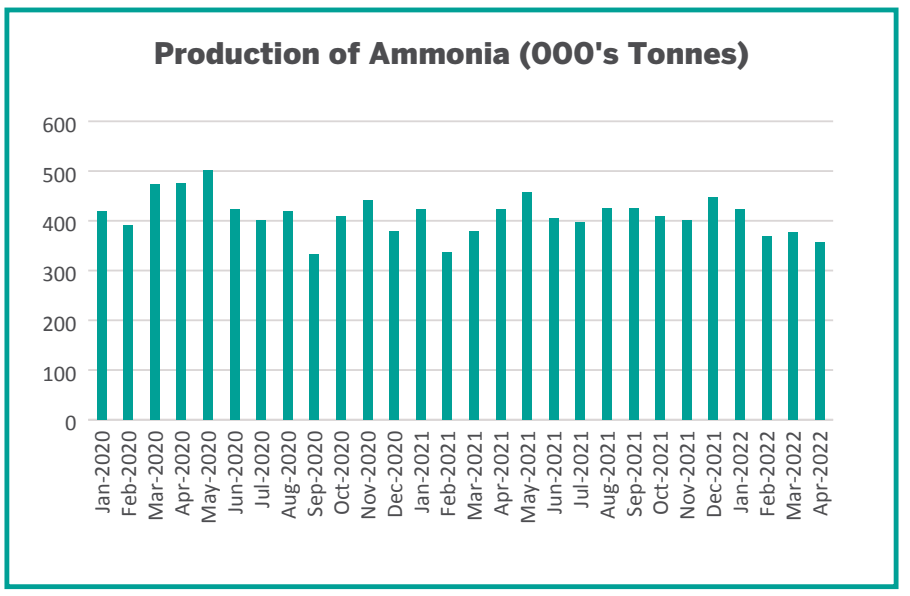

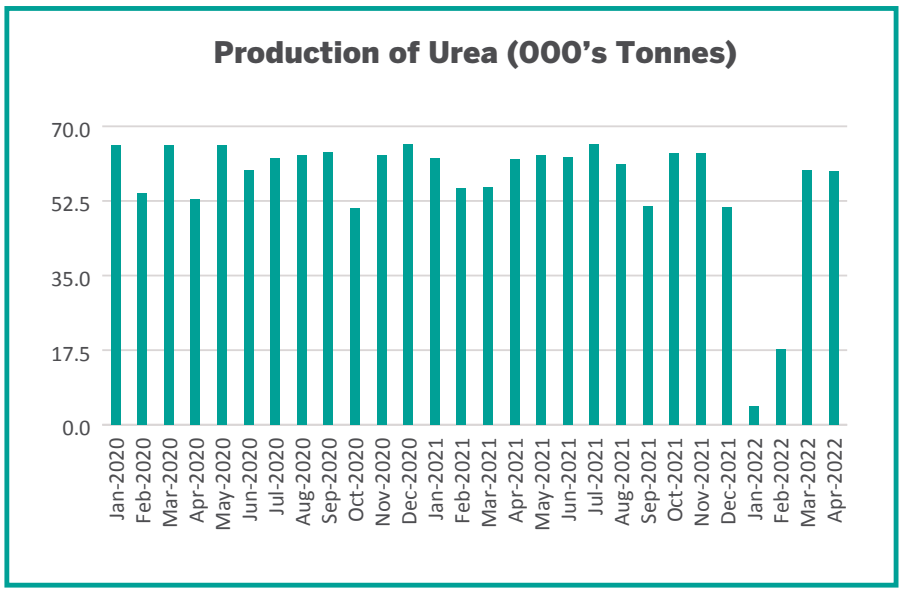

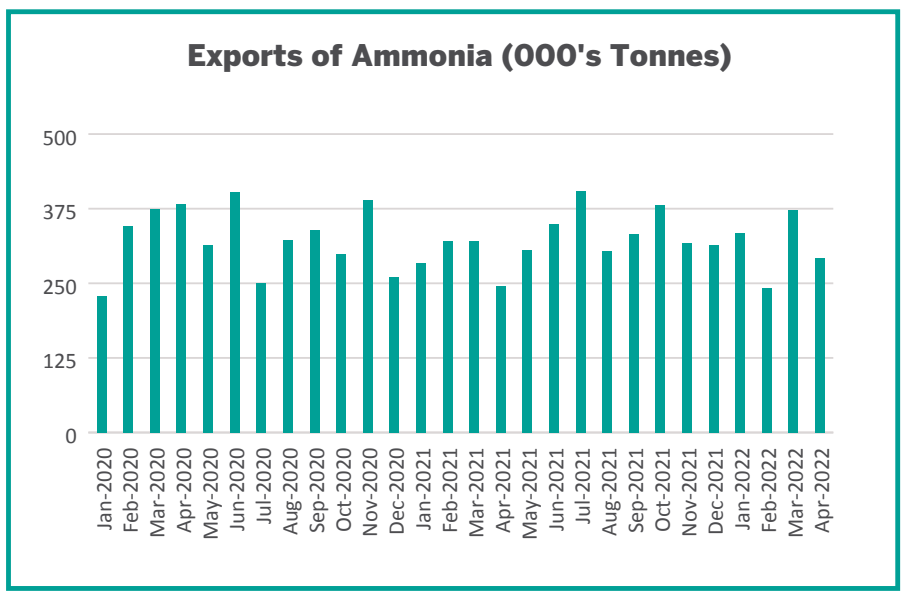

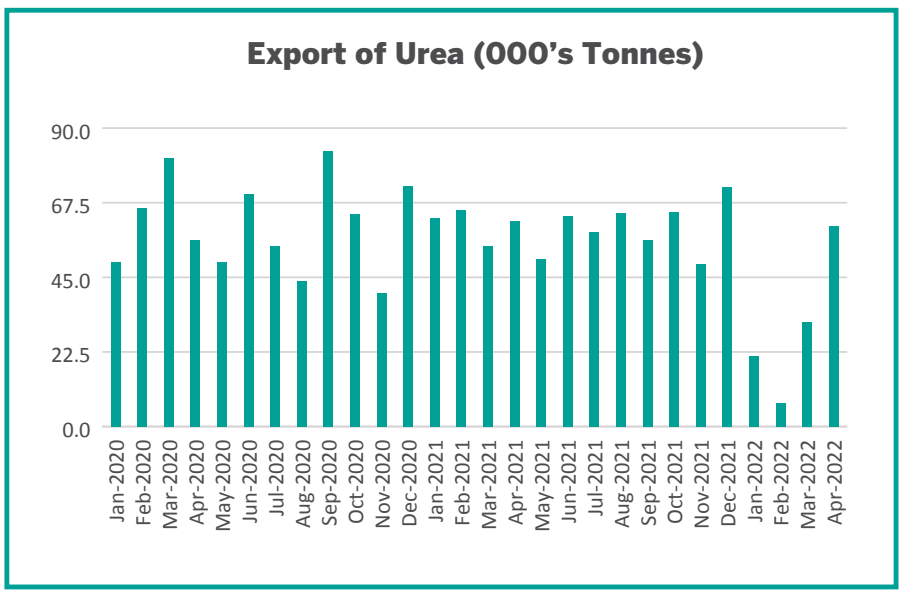

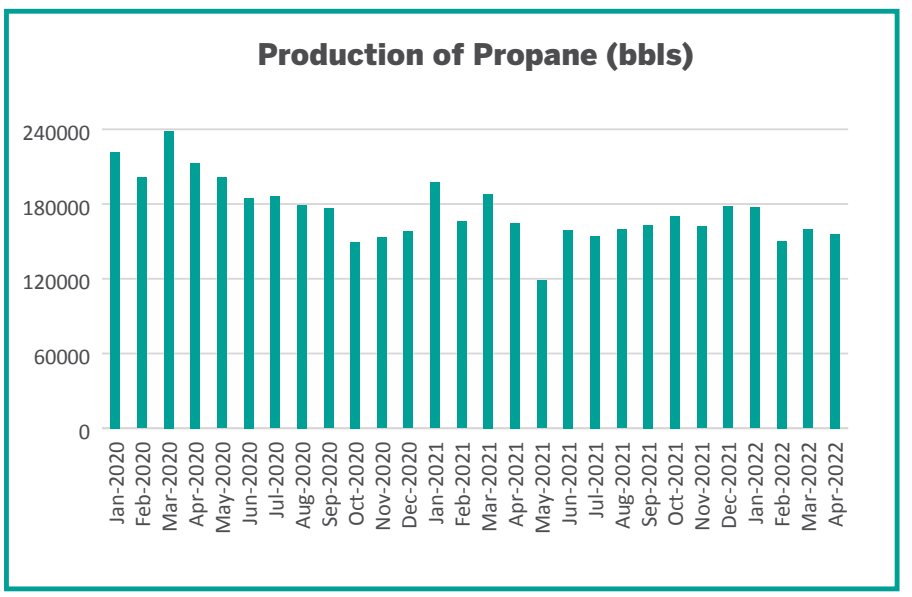

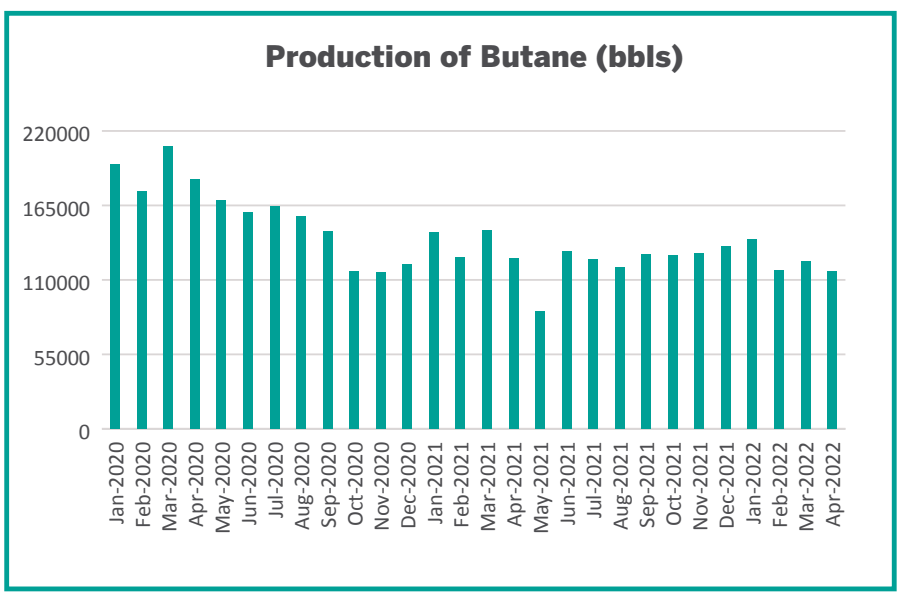

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