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Delivering the Matapal project 7 months early during a global pandemic

Despite the disruptions caused by the COVID pandemic, Trinidad & Tobago's gas industry has managed to deliver some major new projects over the past two years, with BHP's Ruby project, Shell's Barracuda and bp Trinidad and Tobago's (bpTT's) Matapal project being the most recent projects to come online.



Matapal subsea manifold

RENEWABLES TO MAKE ITS WAY INTO OFFSHORE UPSTREAM OPERATIONS IN T&T
CRUDE PRICES TENDING TOWARD \$80 AS T&T CRUDE OIL PRODUCTION INCREASES SLIGHTLY
LIZA UNITY FPSO BEGINS HER VOYAGE TO GUYANA
LIGHTSOURCE BP FURTHER ACCELERATING GROWTH



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- ✔ Data Insights beyond COVID



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Triax has an exclusive partnership with Caribel in Trinidad and Tobago, to ensure a smooth and successful deployment at your facility. Leveraging Caribel's local expertise and proven high-level of service you have come to expect, they are available for local and immediate support in mission critical deployments. Triax supports Caribel with US Based engineering and technical support.

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Delivering the Matapal project 7 months early during a global pandemic

(continued)

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These major oil and gas projects are helping bring additional gas to the market and reverse the declines in production that have characterised the sector in the recent past.

While managing in a pandemic has been a challenge because of strict quarantine restrictions, frequent testing and social distancing measures, Trinidad & Tobago has not seen any major upstream projects significantly delayed or cancelled. The latest project to come onstream has been bpTT's Matapal project, with first gas being delivered seven months ahead of schedule.

Matapal is bpTT's second subsea development in Trinidad & Tobago. It is comprised of three wells, which tie back into the existing Juniper platform, helping minimise development costs and the associated carbon footprint. It is located approximately 80km off the south-east coast of Trinidad and approximately 8 km east of Juniper, in a water depth of 163 metres.

The Matapal project has leveraged the existing infrastructure from the Juniper platform. If there is spare capacity (or *ullage* in the industry jargon) at neighbouring facilities, it will typically be cost efficient to tie in subsea wells to the existing infrastructure. This has the added benefit of typically delivering additional natural gas with a lower carbon footprint. While this may require brownfield modifications to existing infrastructure, this has the benefit of increasing throughput at the facility and typically requires less CAPEX for the field development.

Subsea tieback projects can also typically be executed at a much faster pace than a new offshore facility, improving project economics and returns plus delivering gas earlier to an industry still short on production.

bpTT stated that "Subsea infrastructure lowers the carbon footprint and reduces risk to personnel by hosting much of the equipment on the seafloor away from people. An important learning was that if standardised and proven subsea equipment is used, shorter development timelines are possible and cost savings can be realised; both in terms of CAPEX and OPEX, due to more reliable equipment and the use of common spares and inventory."

Teamwork was frequently identified as the key to the project's success with the various bp functions, contractors, and sub-contractors all united as a team and aligned towards a common goal. Key project leaders reported that collaboration, trust, and transparent communication were key to functioning as an integrated team.

Local content

The project employed many local contractors throughout the project both for brownfield work on Juniper and greenfield work. The engineering and contracting joint venture company, MassyWood, managed and delivered a significant project scope for the brownfield work, including fabrication and modifications on the existing Juniper platform, while leading local energy service company Tucker Energy Services, executed a significant scope of work to support the drilling programme.

According to bpTT, Matapal's local content plan was an important enabler of the company's commitment to maximise local content and

ensure that as much value as possible was retained in country.

Renee Isaacs, bp Matapal Project Manager told *EnergyNow* that "Local content was a critical component to the success of bp Matapal project. Capitalising on local expertise and completing work scopes in region not only provided opportunity for community ownership of this gas development, but also simplified interfaces from purchasing material through to construction and start up. It was an honor to work with local contractors and the project's in-country team to see Matapal through the finish line of providing gas to Trinidad and Tobago."

Right the First Time

According to bpTT, detailed planning, including incorporating lessons learned from recent bpTT projects and other bp subsea tieback projects all contributed to the project's success. In addition, they were able to leverage the learnings from bpTT's existing Juniper project and embedding key design and execution principles from the concept selection stage.

During the project a series of "Right the First Time" workshops and quality campaigns were conducted with contractors, including the front-line staff, which were important for actively sharing what good and bad look like.

Early identification of risks, development of risk mitigation plans, and proactive risk management was an integral part of the planning. This led to the simplification of the subsea execution methodology to ensure activities were optimised and/or eliminated without introducing risk to the project. In addition, continuous re-assessment of risks and coupling to the activity set was done.

Operating safely in a global pandemic

According to bpTT, the key to being able to operate safely was constant communication and engagement with the integrated team, including our EPCIC contractor (Engineering, procurement, construction, installation & commissioning), all other contractors/sub-

contractors and all bp entities—projects, wells, operations, and all supporting functions. This was especially the case because of the ever-changing COVID-19 protocols, as both Trinidad & Tobago and the global community, learnt more about the management of COVID and what this meant for the safety of all personnel.

For much of the project execution, Trinidad & Tobago's borders remained closed and only limited travel exemptions were granted, with stringent testing and quarantine requirements. The company had to learn to utilise remote or virtual site visits to ensure a bp presence, while continuing to abide by international travel and company safety restrictions.

The pandemic did not just impact on people visiting Trinidad & Tobago or the offshore facilities, it also effected the supply chain and the delivery of key project components. Michael Daniel, Project general manager, at bpTT told *EnergyNow*:

"One of the challenges arising from the COVID-19 pandemic was the impact upon global supply chains. Various pieces of equipment for

Matapal were being manufactured in Brazil and in parts of Europe—places that were severely affected by the virus. The team had to work closely with our bp central supplier teams and the contractors to implement interventions to be able to secure delivery to our project on time, and to safeguard employees. It required careful planning and close coordination among all involved."

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Energy Chamber expresses gratitude to former chairman, Eugene Tiah

The Chairman, Board of Directors and Executive office of the Energy Chamber would like to express their deep gratitude to Eugene Tiah who recently retired as Executive Chairman, Energy and Industrial Gases Business Unit Massy Energy.

Eugene has always graciously lent his expertise and knowledge to the initiatives of the Energy Chamber of Trinidad and Tobago. We wish to particularly recognize his dedicated service to the Energy Chamber as Chairman of the Board from 2017 – 2020 and Chairman of the STOW Implementation Board from January 2013 – July 2018.

We congratulate Eugene on his stellar and extensive contribution to the local energy industry and wish him well.



Taxes removed from electric vehicles

Staff Writer | Energy Chamber

During the reading of the National Budget 2021–2022 the Minister of Finance, the Honourable Colm Imbert, made a step forward in attempting to reduce emissions from the transport sector in T&T.

He announced the removal of all taxes from electric vehicles and said that the move was in keeping with the Government's commitment to promote a green economy and reduce our carbon footprint.

He said, "I propose to remove all custom duties, motor vehicle tax and value-added tax on the importation of battery-powered electric vehicles with an age limit on imported, used, battery-powered electric vehicles of 2 years."

Minister Imbert added, "This measure will take effect from January 1, 2022 and will be reviewed after two years."

The announcement made by Minister Imbert was certainly welcomed as Minister of Energy and Energy Industries, the Honourable Stuart Young, also recently made statements alluding to the introduction of an electric vehicle policy.

Speaking at the launch of the NP Preysal Service Station, where the first public solar charging station was installed, Minister Young said, "I am thrilled to see the first electric charger portal for electric vehicles". He added, "This Ministry, with the Ministry of Planning, is preparing a Cabinet Note to seek approval to open this up with a number of incentives, a number of policies, to get electric vehicles progressing in TT. [This is] something that, I am adamant, has to happen in the coming weeks so it can begin to be implemented."

The NP Preysal Service Station is the first fuelling station that includes 320 solar panels and battery storage, which powers the service station and a electric vehicle charging station. Further information is provided in the article on pg 07.

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Renewables to make its way into offshore upstream operations in T&T

Staff Writer | Energy Chamber

T&T has a well-established carbon reduction target of 15% by 2030 across multiple sectors including power generation, industry and transport. The energy sector has been taking leadership in these areas with the two largest natural gas producers, bp and Shell committing to developing two gridscale renewable energy projects (with delivery projected for 2022—subject to negotiations).

However, when it comes to incorporating renewables into upstream operations, DeNovo Energy and Trinity Exploration recently announced their intention to introduce low carbon technologies into their facilities.

DeNovo has indicated that their Iguana platform is already outfitted with solar panels to generate electricity on the platform. Bryan Ramsumair, Managing Director of DeNovo Energy, said that the company moved away from a traditional diesel generation system and installed a thermoelectric generator on the platform to use natural sunlight and natural gas from the well, to power the generation system.

He went on to add that this significantly reduces the overall carbon footprint on their production and has also reduced operating cost both in terms of fuel costs and marine transport to take fuel to the platform. He also stated that by reducing offshore activity their operations have been made safer.

Ramsumair indicated that they will do even better on their newest offshore development, Zandolie.

He said that Zandolie will be a zero emissions platform, fully powered by wind and solar energy.

Ramsumair made these announcements at the T&T Energy Conference, when he also indicated that Zandolie will be a \$32 million investment, with first gas expected in Q1 2022.

The engineering of the platform will be done by Aquaterra Energy, but Ramsumair said that construction will be local.

Aquaterra recently indicated that the platform will be self-powered by a wind turbine and a solar bank. By using a dual energy resource, the design reduces intermittency risk and will include a battery to store excess power. The innovative solution eliminates the need for traditional diesel generators for power, significantly reducing emissions, including those associated with the maintenance and logistics for refuelling visits to the platform.

In addition, the platform will also be equipped with intelligent monitoring technology, which reduces maintenance trips by only requiring personnel to visit when alerted via onshore systems.

The company also indicated that the platform was engineered to withstand seismic activity, the minimum facilities platform will be designed for drilling and installation via a jack-up rig to reduce project costs—removing the need to mobilise a heavy lift vessel. The Sea Swift platform's reduced steel requirement and focus on using available in-region infrastructure offers a low-emission, low-risk and low-cost route to reduce time to first oil or gas production.

Stewart Maxwell, Technical Director at Aquaterra Energy, said, "Intelligent engineering is at the heart of what we do, so this renewable-powered solution is a testament to our ethos.

We are committed to delivering solutions that support our client's decarbonisation efforts across all aspects of our work—whether that's reducing interfaces, indirect emissions or enabling more in-country fabrication. All of these actions add up and that's why we're focused on more efficient operations across every aspect of the value chain."

Bryan Ramsumair, Managing Director at DeNovo, adds, "DeNovo is committed to securing Trinidad and Tobago's energy future—in a cleaner way. The Zandolie platform will be 100% powered by renewable energy. This is proof of our commitment to develop hydrocarbon resources in a way that minimises the carbon footprint of our operations.

"We have built off our existing infrastructure for our Iguana field, which has enabled a smaller platform for our second field development. We are confident that this will enable the Zandolie platform to be fabricated in Trinidad and Tobago—maximising the use of local expertise and further emphasising DeNovo's local content commitment."

Speaking at the Trinidad and Tobago Energy Conference, Jeremy Bridgelalsingh, Managing Director of Trinity Exploration and Production, spoke about their ambitions to reduce the carbon intensity of their production.

Trinity Exploration, is looking at commencing a data collection study with the University of the West Indies to ascertain the technical feasibility of developing a largely renewable energy based power plant at Galeota to produce green electrons for offshore usage. Bridgelalsingh said this will be done to drive



The proposed Zandolie Platform

down the carbon intensity of the oil being produced. He said this is trying to blend both renewables and the modern oilfield.

Bridgelalsingh alluded to the wind resource on the east coast as an opportunity for development.

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Crude prices heading toward \$80 as T&T crude oil production increases slightly

Staff Writer | Energy Chamber

The international price of crude oil has been rising since the dramatic plunge in April 2020 when the world reeled from the global lockdowns and restricted movement of people. The destruction of demand happened suddenly and suppliers all over the world were considering drastic options since storage was running out for produced crude.

A bit more than a year later and the crude oil price has reached peaks that it has not seen in 3 years. The average price in September for crude both at Cushing and in Europe has been above \$70 and in the past days has come within grasp of \$80.

Energy commodities continue to rise due to gas shortages in Europe which has served to pull coal and crude prices along.

According to *oilprice.com*, recovering oil demand and an underwhelming supply response, coupled with expected higher oil consumption in a gas-to-oil switch, are tightening the crude market and deepening the backwardation in the futures curve—a sign that market participants believe supply will continue to be tight.

Analysts believe, however, that global oil prices will continue to rise amid surging demand and tight supplies.

Investment bank Goldman Sachs said Brent could hit \$90 per barrel by the end of the year, projecting that rising input costs, higher gas prices and weaker growth were likely to weigh on European corporate profit growth for 2021.

"When growth slows, it becomes harder for companies to pass on higher input costs, which is the main risk for net income margins," the company said.

Minister of Energy and Energy Industries, the Honourable Stuart R Young, M.P., expressed optimism recently that T&T could benefit from higher prices.

It should be noted that T&T prices crude prices are typically pegged to Brent prices.

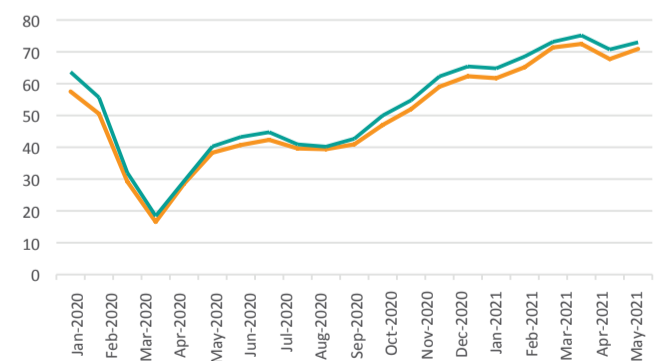
T&T production, however, has actually improved slightly in May—the Ministry of Energy and Energy Industries reported production of over 61,000 barrels per day. The production rate has not been above 60,000 barrels per day since July 2018.

This is largely due to increased production from BHP from just over 4,000 barrels/day in April to almost 7,000 barrels per day in May. The increase in BHP's production is from production off of the Ruby development.

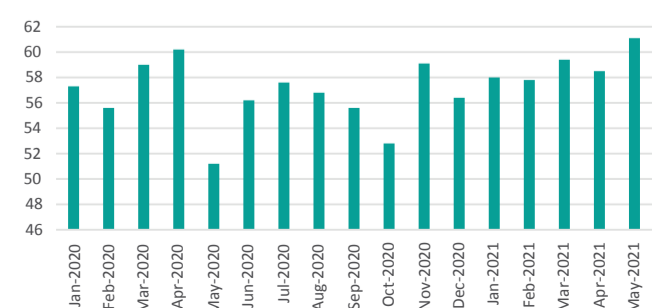
BHP anticipates that production from Ruby when ramped up will contribute 16,000 barrels/day and 80 mmscf/d of natural gas. BHP achieved first production in May.

Learn more and have your say online:
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Monthly Crude Prices - WTI vs Brent



T&T Crude Oil Production Daily Average (000's Barrels)





POWERGEN WINS MARUBENI GLOBAL SAFETY AWARD

The Power Generation Company of Trinidad and Tobago Limited (PowerGen), Trinidad's largest and longest-serving independent power producer, was awarded the prestigious Marubeni Power Division Safety Award of Excellence for 2020 on July 7th, 2021 at a virtual ceremony hosted simultaneously in Trinidad and Tobago and Japan.

PowerGen surpassed 45 power generation companies from around the world to win this award. The Safety Award of Excellence was presented in recognition of the Company's achievement of zero fatalities and lost time injuries since 2018 and our handling of the COVID-19 pandemic to ensure the safety of our employees and the company's core business was able to continue uninterrupted.

We express our gratitude to our employees for their support, contributions and making safety their consistent priority. This award cements the international quality of our safety systems and capabilities. This Global Safety Award has validated PowerGen's contribution both in the domestic power industry and within the Marubeni group.



CONGRATULATORY MESSAGES

Senator the Honourable Dr. Amery Browne, Minister of Foreign and CARICOM Affairs,

"This award is a testament to the strong cooperation and partnership between Japan and Trinidad and Tobago that we continue to have strong links involving the private sector and also the public sector across many thousands of miles."

Mr. Romney Thomas, Chairman of the PowerGen Board of Directors

"The attainment of this Marubeni Safety Award has placed PowerGen in the echelons of safety standards by not only meeting but exceeding the global safety metrics set by Marubeni. An achievement that places our Caribbean operation alongside more developed and larger Marubeni assets. PowerGen has done the energy sector proud and by extension has made our nation proud."

Mr. Hiroshi Tachigami, the General Manager of Marubeni Power business in the Americas, Europe, and Australia,

"The safety management standards of PowerGen are clearly among the best in the world. I must commend the entire team, from management to workers, for implementing and meeting such demanding safety benchmarks."

Mr. Mo Majeed, Chief Operating Officer MPEI and Managing Director Caribbean.

"Generating electricity is an extremely dangerous business, where personnel could be exposed to high temperatures, pressures, as well as high voltages. Marubeni believes that protection of personnel, equipment and environment is a fundamental requirement of how we conduct our power businesses around the globe. The same is true for PowerGen."

Mr. Damian Obiglio, Senior Vice President Marubeni Power International

"PowerGen's state-of-the-art safety programme was based on one fundamental principle, align corporate responsibility with individual responsibility. We trust our employees and we trust our systems. When employees buy into the system, we get excellence in all areas."

Mr. Surindranath Ramsingh, PowerGen's General Manager

"The receipt of the Marubeni Safety Award of Excellence 2020 marks a milestone in PowerGen's history since this is our first time receiving such a prestigious international award. PowerGen is currently the largest Independent Power Producer on the island, generating approximately 45% of the island's power and the health and safety of our employees has always been the top priority of our business."

Mr. Daren Jadoo, PowerGen's Head of Health, Safety, Security and Environment,

"To our HSSE professionals and all our employees, we thank you for your support, guidance, feedback and continued commitment to making PowerGen a safe place to work. This award would not have been possible without you. Inspired by our HSSE motto, "One Team. One Mission", we have worked as one PowerGen team on one Safety mission and this has not gone unrecognised."



Is Trinidad & Tobago benefitting from the high Asian and European gas prices?

Staff Writer | Energy Chamber

With Europe and Asia currently experiencing record high spot prices on imported LNG, there is a lot of interest whether these prices will find their way back to the wellhead price in Trinidad & Tobago and hence provide a much-needed boost to government revenue.

The data contained the Ministry of Finance's "Estimates of Revenue", released at the same time as the national budget statement, suggest that so far these record natural gas prices, and the healthy oil prices, have not led to a boost in revenue. Indeed, the documents record that the estimated royalties received in 2021 financial year were *down* on the 2020 financial year.

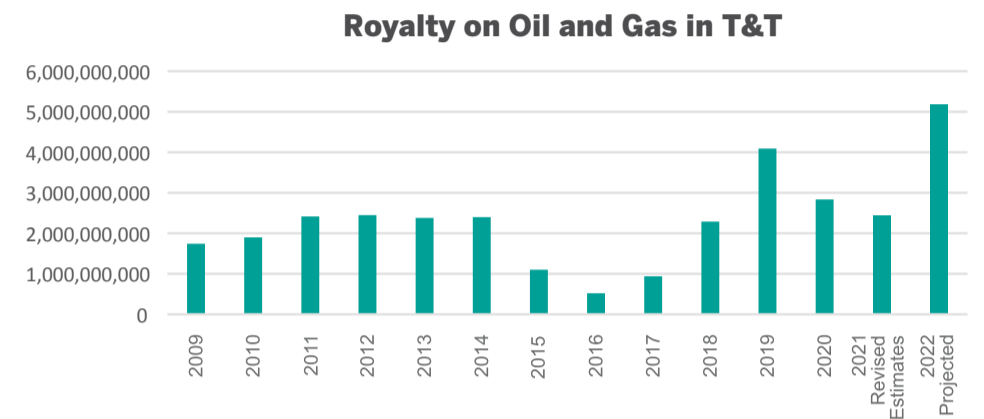
As royalties are based on top line revenue rather than profits, this lower figure is surprising. However, there may be some good reasons that the published number is lower, despite the good prices. The first reason is just an issue of timing, as the number in the "Estimates of Revenue" is just that: an *estimate* made some time before the close of the financial year. The final confirmed number may be significantly higher (or lower) than the estimate. The estimated royalty number for fiscal 2020 presented this time last year was revised 8% upwards when the final confirmed numbers were published this year.

Prices have spiked towards the end of the financial year, so this may not have been anticipated when the estimates were generated. It is also worth noting that the prices realised on a cargo of LNG delivered in October may have been priced based on a marker from July or August.

The other timing issue that is important is when payments are received by the government. The government accounts on a cash basis, rather than an accrual basis, so if a big cheque is received from one of the major oil and gas producers a few days before or after the close of the financial year it can make a material difference to the figures as reported. This has been something that has been consistently highlighted in the reports of the Extractive Industries Transparency Initiative.

Apart from these two accounting issues, it is important to also realise that royalties reflect not just price, but also production and gas production has been a lot lower in the first half of 2021 than it was in 2020 (the July – September 2021 production figures are not yet available).

It is also important to remember that gas prices have huge variations between geographical areas and between marketing contracts. While you can be certain that crude oil prices will be within a reasonable percentage margin of the published benchmarks, gas prices can vary by many orders of magnitude. It is important to note that the very high prices that are getting the media attention are spot prices, rather than long-term contract prices. Within the Asian and European gas markets there will be tranches of pipeline gas or domestic gas production that are being delivered at much lower prices. While everybody loves the spot market when prices soar, they are not as keen when they crash. In January 2021 Asian LNG



spot prices more than halved in 24 hours, after a few weeks of strong growth.

For Trinidad & Tobago, there is a tranche of gas from some of the producers that is sold at very low prices for supply to the electricity sector. Other upstream producers have sales contracts with set sales prices that will not vary with the international prices. Other sales contracts have prices linked to the petrochemical commodity prices. Ammonia and methanol prices have been very healthy in the recent past, but they have not shown the astronomical growth of European and Asian LNG spot prices.

For LNG sales there are various marketing contracts in place for the different producers selling through the various trains. In many cases the LNG cargoes will be contracted to specific markets and usually linked to the US Henry Hub price, which remains the key benchmark to determine the likely realised value of our LNG exports. Henry Hub prices are significantly up, currently around three times higher than this time last year, but not as

spectacularly high as the Asian and European spot market gas prices, which are currently a staggering seven times higher than this time last year. As the Trinidad & Tobago LNG exporters will have contracts to fulfil in the Americas, including the key markets of Brazil, Argentina and Chile, they may not be able to divert many of their cargoes to Asia and Europe.

In short, the full extent to which Trinidad & Tobago has been able to benefit from the high gas prices in Europe and Asia remains to be seen. While the additional revenue would be most welcome, it is probably not a good idea for Trinidad & Tobago to get too carried away with the media reports on the Asian and European spot gas prices.

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Government to provide urgent subvention to Lake Asphalt

Staff Writer | Energy Chamber

The Ministry of Energy has indicated that Lake Asphalt Trinidad and Tobago (1978) Limited (LATT), like most businesses, has suffered as a result of the COVID-19 pandemic.

The Minister of Energy and Energy Industries has urgently sought and obtained Cabinet approval to be able to provide LATT with subventions to assist it in the payment of its expenses, including the payment of its workers. This is the second intervention by the Government in 2021 to provide subventions to LATT in order that it can meet its obligations to its workforce.

The Ministry of Energy and Energy Industries personnel have communicated with the Ministry of Finance to prioritise the payment of the subvention.

The Government, via the Ministry of Energy and Energy Industries, is currently looking at how LATT can become self-sustainable as it is not acceptable for LATT to continue depending on subventions from the Treasury to cover its wages and expenses.

The Minister of Energy and Energy Industries, the Honourable Stuart R Young, M.P., has prioritised the pursuit of the plans to make LATT self-sustainable and intends to approach the Cabinet shortly with proposals along these lines.

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HDF Energy breaks ground on world's largest green hydrogen-power project

Staff Writer | Energy Chamber

HDF Energy has announced start of construction of CEOG (French Guiana), the world's first baseload renewable energy power plant using hydrogen technology.

According to HDF, the facility will be a multi-megawatt power plant, producing stable and dispatchable electricity, 24 hours a day, without polluting emissions.

The power plant, designed and developed by HDF, will supply a 100% renewable, stable and dispatchable power to 10 000 households at a lower cost than the diesel power plant, but without emitting any greenhouse gas, fine particle, noise or fumes. A Renewable[®] power plant produces electricity using local sources of clean energy to fully sustain the local needs, reducing exposure to oil price volatility, supply risks, and saving foreign exchange.

Representing a total investment of US\$200 million, CEOG is an optimised combination of a solar park, a hydrogen long-term energy storage and a battery (short-term energy storage) to produce 24/7 baseload power. It is the first time that a renewable energy project

supplies a grid through a capacity-based Power Purchase Agreement, usually used for thermal power plants. This type of electricity offtake contract guarantees the availability and stability of the electricity produced by CEOG. This last characteristic is essential for powering isolated grids or reducing congestion on large networks.

CEOG is currently being duplicated in about 20 countries such as Mexico, Caribbean island nations, Southern Africa, Indonesia and Australia. Competitive with diesel power plants, the Renewable[®] power plant addresses a large power generation market.

HDF has already identified a pipeline of US\$3 billion. HDF Energy already has several similar projects under development in the Caribbean region, including in Barbados where it has registered its local subsidiary HDF Caribbean, next to its strategic regional partner Rubis Caribbean.

Executives of the company will be in Trinidad & Tobago in the first week of October to continue investment discussions for the low carbon hydrogen project being developed by

Newgen Energy Ltd. They will also meet with members of the National Gas Company Group, the national power distributor T&TEC and the downstream petrochemical industry.

Thibault Menage, VP Caribbean at HDF Energy, said, "After successful development of hydrogen power projects in Martinique and French Guiana, HDF Caribbean is now rapidly expanding its regional footprint. We are committed to the deployment of a regional green hydrogen economy that starts with the implementation of large-scale bankable projects".

Menage said he is encouraged by the opportunities that exist in T&T. He went on to add that in T&T a hydrogen market currently exists, and it is a hydrogen captive market because of the ammonia and methanol plants already installed. However, these plants currently use "grey" hydrogen, and in order to decarbonise ammonia and methanol, "green" hydrogen is needed.

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New Preysal fuel station is a nod to The NGC Group Green Agenda

Staff Writer | Energy Chamber

The recently opened Preysal multi-fuel service station is a nod to the NGC Group Green Agenda in more ways than one. The NP-branded station has 14 liquid and 10 CNG filling spots in addition to an Electrical Vehicle (EV) charging station.

In keeping with this country's renewable energy mandate, solar technology is powering the operation of the new station. The NGC Group was issued the first renewable energy, non-utility scale license by the Ministry of Public Utilities. The license was granted for the use of the expansive solar photovoltaic (PV) system at the new Preysal Service Station. National Energy's Sustainable Energy Division managed the installation of the solar panels and tie-in to the power requirements of the facility. The 320 panels will generate 100 kW of power, which will be used for:

- A rapid or Level 3 direct current (DC) charging station for EVs with three modes of charging and capable of charging two vehicles simultaneously. This is the first high-speed EV charger in Trinidad and Tobago
- Canopy lighting
- Convenience store and peripheral lighting
- Liquid fuel dispensers

The new station will also cater to the thousands of residents of the area and provide convenience to commuters who traverse the Sir Solomon Hochoy Highway. This is welcome news to

CNG users and this station is strategically positioned to service North-South CNG customers.

Speaking at the opening of the station, NGC CNG President Curtis Mohammed said the issue of the non-utility scale license was "...an excellent milestone for renewable energy in our country."

Mr. Mohammed expressed pride about the stakeholder collaboration that made the project a reality. He said, "The development of this facility provided an opportunity for the NGC Group to work closely with the Ministry of Public Utilities and with electricity provider T&TEC to integrate our solar PV system with NP's liquid fuels business to properly prepare for a future with cleaner fuel options while being cognisant of pending liberalised prices at the pump."

The NGC Group maintains its commitment to creating a sustainable future by exploring all opportunities to embrace the new energy future.



Solar Panels on the Preysal Service Station

Learn more and have your say online:

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National Energy and Methanex collaborate on methanol fuel feasibility study

Staff Writer | Energy Chamber

The National Energy Corporation of Trinidad and Tobago Limited signed an MOU with Methanex Trinidad Limited to conduct a feasibility study to explore the viability of methanol as an alternative fuel for marine and vehicle transport in Trinidad and Tobago and the region.

This MOU represents a public-private sector partnership in support of the Government of the Republic of Trinidad and Tobago's Paris Agreement commitment to reduce greenhouse gas emissions by 15% by 2030 from a 2013 baseline.

When compared to conventional marine fuels, methanol as a clean-burning liquid fuel has the immediate ability to meet International Maritime Organization regulations (IMO) 2020 air quality emissions regulations that benefit human health. Methanol as a marine fuel can reduce sulphur oxide and particulate matter emissions by more than 95%, nitrogen oxide by up to 80% and CO₂ emissions during combustion by up to 15%. Methanol also offers multiple pathways to decarbonisation to meet future emission compliance, including the IMO's 2030 and 2050 decarbonisation goals. In addition, there is growing interest in methanol as an alternative fuel for road transportation due to its emission benefits.

As the world's largest producer and supplier of methanol globally, Methanex is actively supporting the adoption of methanol as an alternative marine and automotive fuel and brings its renowned expertise towards this partnership. For example, through its subsidiary Waterfront Shipping, Methanex currently operates a fleet of 12 methanol-fuelled ships. By 2023, about 60% of its 30-ship fleet will operate on methanol dual-fuel

technology creating a fleet capable of having one of the world's lowest emission profiles.

President and Managing Director of Methanex, Mr. Colin Bain, is optimistic about the partnership, noting that, "The MOU is a key step forward for Trinidad and Tobago. Methanol, with its cleanburning characteristics, is an attractive pathway compared to conventional transport fuel and a step towards Trinidad and Tobago's green agenda targets. Methanex and National Energy have a rich history of collaboration, so we are very thrilled to be partnering with National Energy once again for the benefit of the country and by extension the region."

National Energy is also taking a leading role in the energy transition. Company President, Dr. Vernon Paltoo, welcomed the partnership stating that, "with over 40 years experience in the development of the energy industry, the company is well-positioned to play an integral role in transitioning Trinidad and Tobago to a low-carbon future. The work arising out of this MOU will surely change the narrative for using alternative fuels locally. As a member of The NGC Group, the execution of this MOU between National Energy and Methanex advances the Group's green agenda for a sustainable future for the people of Trinidad and Tobago."



National Energy and Methanex sign a MOU at National Energy's Head Office



Methanex methanol-fuelled ships at National Energy's Savonetta Pier 4 in August 2021

Rystad: LNG price rally spurs oil switch in Asia, boosting oil prices and demand by 400,000 bpd

Staff Writer | Energy Chamber

According to research firm Rystad Energy, the recent rally in LNG prices in Europe and Asia has dramatically widened the economic incentive to switch from natural gas to oil in power generation. Steep carbon regulations and operational constraints limit Europe's ability to burn oil in power plants, but Asia has more flexibility. If the gap between LNG and oil prices remains wide, Asia is set to boost oil demand by 400,000 barrels per day on average over the next two quarters, a Rystad Energy report shows. This will support already high oil prices.

Asia's liquid-burning capacity for power generation has declined over the past 10 years, but still sits at about 100 gigawatts (GW), mostly in Japan, Taiwan, Indonesia, Bangladesh and Pakistan. Asia's current oil consumption for power generation fluctuates at around 900,000

bpd, which leaves a monthly unused and available oil-burning capacity of a bit more than 550,000 bpd. As the continent is expected to add 400,000 bpd on average in the next six months, utilisation of the oil-burning infrastructure will surge.

When Rystad looked at the potential uplift in demand of 550,000 bpd, Japan would account for the lion's share with more than 300,000 bpd, followed by Indonesia (58,000 bpd), Taiwan and Bangladesh (39,000 bpd each) and Pakistan (33,000 bpd). This assumes a load factor of 0.7 for all the liquid capacity, and also takes into account that some older natural gas plants can switch to oil temporarily.

"This is a significant increase for Asia, when looking at its current oil-to-power use. From a

global oil balance perspective too, this would be a significant shift, and it provides support to the current rally in oil prices," says Claudio Galimberti, Senior Vice President on Rystad Energy's oil markets team.

Rystad Energy looks at the spot and futures prices of the JKM and TTF gas-price benchmarks and considers five different thermal efficiency scenarios for natural gas and oil in power plants. It is normally not economical to run oil at any of the five efficiency levels—the only exception in 2020 and 2021 was in January 2021, when the polar vortex caused oil prices in Japan to jump. However, as Asian natural gas prices are currently forecast to shoot up and stay well above \$20 per MMBtu over the coming Northern Hemisphere winter, there

is clear upside for oil demand in this region—unless the oil price were to increase even faster and cause the price spread to LNG to narrow.

Liquid-burning power plant capacity is approximately 2.6% of the total installed capacity in Asia, but usually actual power generation coming from liquids is lower. Pure liquids plants have typically had very low utilisation factors, both for economic and environmental reasons. Overall liquids generation in Asia only accounted for around 1% of total power generation last year, down from around 3% a decade earlier.

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T&T national budget 2022

Staff Writer | Energy Chamber

When the Trinidad & Tobago Minister of Finance presented his national budget statement for fiscal 2022, much of the general public focused primarily on his promises to remove VAT on a range of food items, with social media attention somehow focusing on pigtail. For the country's energy industry, however, the most important item was his promise that the government would shortly embark on a comprehensive reform of all elements of the oil and gas taxation. In subsequent public engagements he made it clear that this would be fast tracked and completed expeditiously.

That news was generally welcomed by the energy sector (see Energy Chamber editorial on page 11) though there have been concerns expressed about how quickly the review and subsequent changes could take place. The promise from the Minister of Energy, reiterated by the Minister of Finance in the budget speech, that there would be three bid rounds in 2022 (covering onshore, shallow water and deep-water acreage) has heightened concerns that the reviews are fast-tracked.

While the Minister of Finance did highlight the issues of the energy transition and the implications for Trinidad & Tobago, there were few specific measures to address climate change or the energy transition directly. The removal of electricity and transport fuel subsidies are clearly part of that overall shift, though they were more tackled from a fiscal management perspective rather than an energy efficiency and environmental point of view.

The budget statement suggested that the Regulated Industries Commission would soon be completing its rate review and recommending a new tariff structure for both water and electricity. Subsequent media statements from the Minister of Public Utilities suggested that

the T&T Electricity Commission and the National Gas Company had agreed to a new gas sales contract, which had been the outstanding issue that had delayed the electricity rate review process. The Minister of Finance made it clear that most fuel subsidies would be removed and that instead of general price subsidies, targeted relief would be provided to the neediest households. The suggestion was that electricity usage (that tends to equate with wealth) would be used to target this relief to the individual households.

One specific energy transition-related measure that has received a lot of attention was the removal of all import and other taxes on full electric vehicles less than two years old. This is a measure that the Energy Chamber and other e-mobility advocates had lobbied for, though the call had been to address this as part of a wider sustainable transport policy. With the Minister of Energy and Minister of Planning reportedly jointly working on an overall e-mobility policy, further details might be expected during the budget debates in Parliament. This reform, coupled with the recent opening of the solar power fast-charging station in Preysal, has placed a strong spotlight on EVs.

The other greenhouse gas reduction measure that was outlined in the budget speech was a specific new tax allowance for investments in enhanced oil recovery and carbon capture and sequestration. This measure has received no real media coverage. It has been welcomed as a step in the right direction by people in the oil and gas industry, but the consensus view seems to be that the threshold for the credit is simply too low for the measure to have much of an impact. The expectation would be that this issue, would also be addressed in the comprehensive reform programme.



While most of the tax benefits and other support measures were targeted either at manufacturing or the digital space, there were also some of the general business support measures that were of interest to the energy services sector. The statements on the moves to widen the scope of skills certificates and to enhance the free movement of people, were items that the energy services sector would monitor closely. There was also support from the energy services sector for the announcement of plans to open various trade facilitation offices, with an obvious particular interest in the proposed office in Guyana (that would also cover Suriname). This is an initiative that would be welcomed by the many Trinidadian

service companies that have set-up in Guyana and those planning to enter the market soon. As with many items announced in the budget, people in the energy services sector will be waiting to see how quickly these plans can be implemented.

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APA Corporation: Non-commercial quantities of hydrocarbons found at Keskesi South-1 offshore Suriname

Staff Writer | Energy Chamber

APA Corporation announced results from appraisal drilling at Keskesi South-1 on Block 58 offshore Suriname. APA Suriname holds a 50% working interest in the block, with TotalEnergies, the operator, holding a 50% working interest.

Keskesi South-1, drilled approximately 6.2 kilometers from the discovery well Keskesi East-1, encountered non-commercial quantities of hydrocarbons and the well has been plugged and abandoned.

"The first appraisal well at Keskesi was a substantial step-out designed to assess the southern extent of the feature," said Tracey K. Henderson, APA's Senior Vice President, Exploration. "This location had the potential to confirm a very large resource in place if connected to the reservoir sands in the discovery well. However, suitable reservoir quality sands were not developed in the Campanian target at the Keskesi South-1 location. Data gathered from the well will be used to calibrate our geologic model and inform the next steps for Keskesi appraisal."

The Maersk Developer has moved to the Sapakara South-1 well, where it will conduct a flow test of the previously announced appraisal success. Following the completion of the Sapakara South-1 flow test, the exploration program will continue with the spud of the next exploration well targeting the Krabdagoe prospect just to the east of Keskesi. The Maersk Valiant is currently drilling Bonboni, the first exploration prospect in the northern portion of Block 58. Both rigs are operated by TotalEnergies.

Block 58 encompasses 1.4 million acres and is in the early phases of exploration and appraisal. APA has participated in four exploration discoveries and one appraisal success offshore Suriname in the past two years. In addition to its 50% working interest on Block 58, the company also holds a 45% working interest in Block 53, where it plans to drill an exploration well in 2022.

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Maersk Developer carried out the drilling operations in Suriname for APA Corp

Liza Unity FPSO begins her voyage to Guyana and becomes world's first FPSO to receive SUSTAIN-1 class notation

Staff Writer | Energy Chamber

The Liza Unity FPSO started its voyage to Guyana, having departed from Keppel shipyard in Singapore. The FPSO is expected to arrive in Guyana late this year. Once the FPSO arrives at the Liza field in Guyanese waters, she will be hooked up to the seabed, which will then be followed by installation of umbilicals and risers, allowing the next phase of operations to start.

The Liza Unity FPSO has also been awarded the SUSTAIN-1 notation by ABS, the Classification Society. This means that the design and construction of the unit is assessed against and adheres to the requirements of the ABS Guide for Sustainability Notations, aligned with the applicable UN Sustainable Development Goals. The Liza Unity is the world's first FPSO to achieve such recognition for sustainability for its design, documentation and operational procedures. Examples of features recognised by the SUSTAIN-1 class notation include energy efficiency management, mitigation of ozone depleting substances and management of hazardous materials throughout the life cycle.

Olivier Icyk, Managing Director Floating Production Solutions, commented, "We are pleased to see that the Liza Unity FPSO is ready for the next phase and we look forward to cooperating closely with our client ExxonMobil to ensure that the start-up is a success. We are also very proud to see Liza Unity obtaining the SUSTAIN-1 class notation, the world's first FPSO to do so. At SBM Offshore we work closely with

our clients and our supply chain towards the goal of reducing emissions from our products. This is an important step in our journey to deliver safe, sustainable and affordable energy from the oceans."

The Liza Unity FPSO is designed to produce approximately 220,000 barrels of oil per day, to have associated gas treatment capacity of 400 million cubic feet per day and water injection capacity of 250,000 barrels per day. The FPSO will be spread moored in water depth of about 1,600 meters and will be able to store around 2 million barrels of crude oil. There are a total of 19 topsides modules.

The FPSO represents SBM Offshore's first Fast4Ward design, benefitting from standardisation of the project's execution plan and using a fully completed and commissioned MPF hull, which sets the benchmark for future FPSO projects. The project continues to target first oil in 2022, in line with client schedule.



The Liza Unity FPSO docked in Singapore in November 2020

Photo by: SBM Offshore

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The need for speed in the fiscal reform review

editorial

THE ENERGY CHAMBER of Trinidad & Tobago welcomes the Minister of Finance's commitment that the government will conduct a comprehensive review of our oil and gas taxation regime to ensure that we remain an internationally competitive hydrocarbon province. The Energy Chamber would welcome the opportunity to work closely with the government in this review process that is vital to ensure the continued investment in upstream oil and gas production.

As the Minister of Finance highlighted, continued investment in upstream production is needed even while the country transforms its energy industry to a lower carbon future and diversifies its economy.

In early 2021, the Energy Chamber put together a Fiscal Reform Task Force that conducted a detailed analysis of the sector and made recommendations for reforms. A comprehensive final report was delivered to the Ministry of Finance and Ministry of Energy and Energy Industries in early August 2021. The Fiscal Reform Task Force recognised that a fundamental review exercise was warranted and that this "should take into consideration all aspects of the energy fiscal environment, with a view to creating an environment appropriate for a mature basin that allows existing participants to continue to invest and new participants to enter and to prosper".

The Fiscal Reform Task Force also highlighted some areas where changes could be implemented immediately. While the Energy Chamber is very encouraged by the announcement on the comprehensive review process, there are some areas where immediate changes could unlock some projects awaiting a final investment decision. We would welcome a process where some recommendations could be fast-tracked, even as all of the issues are being resolved.

One such reform was with Supplemental Petroleum Tax (SPT), where changes could spur immediate investments in oil production, as recognised by the Minister of Finance in his post-budget comments to the TTMA forum.

The positive changes introduced in 2020 for small onshore producers have already contributed to increased activity onshore, where we have seen some exciting new discoveries. If these changes were extended to the offshore crude oil producers and the production thresholds raised, then we believe we would have seen some investment decisions

The Fiscal Reform Task Force recommended changes to the existing flat royalty rate. The current structure is particularly challenging for smaller and more marginal fields, especially if they are distant from existing infrastructure.

being taken very quickly and new production being brought on stream.

This change to SPT would also have been very beneficial to the state-owned Heritage Petroleum and their efforts to identify new joint venture partners to build on their initial success in turning around production from their acreage.

For the gas industry, the Fiscal Reform Task Force recommended changes to the existing flat royalty rate. The current structure is particularly challenging for smaller and more marginal fields, especially if they are distant from existing infrastructure. It also acts as a disincentive for exploration investments and ultimately impacts the entire value chain. Changes to royalties may not have had the same short-term impact on developments of new fields as SPT changes, but could have helped spur on new exploration activity and investment decisions for more marginal fields, to maintain the targeted plateau of gas production in the medium-term.

The Fiscal Reform Task Force also made recommendations for dealing with the vexing issue of VAT refunds, and a commitment to address this issue in the immediate term would also be most welcome.

The Energy Chamber is heartened by the Minister of Finance's commitment that the review process will take place expeditiously and we know that the Minister of Energy will be especially keen to complete the process in order to boost confidence in the upcoming 2022 bid rounds. The Energy Chamber is confident that the recommendations we made through our Fiscal Reform Task Force will be carefully considered in this process.

We remain committed to working with all stakeholders to implement the reforms we need to sustain our hydrocarbon sector through the energy transition and beyond.

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A small step forward for sustainable transport

Dax Driver | Energy Chamber CEO
@dax_driver



I WAS DELIGHTED to see the Minister of Finance remove all import duties and other taxes on electric vehicles (EVs). Coming on top of the recent launch of the first solar-powered fast-charging station, the new NP service station in Preysal, this has given a big boost to the profile and possibilities of EVs in Trinidad & Tobago.

I have owned an electric car for the past two years. Despite the fact that it is a mid-range model and significantly less fancy than the luxury brands driven by many of my peers, I love it (though before I make myself out to be some sort of maverick, I should say there are in total three Board members out of sixteen in the Energy Chamber who drive EVs). As most people comment, the responsiveness of the EVs' acceleration and the quiet running make them a pleasure to drive.

I charge my car at home, with a 220V connection on my driveway wall, which means that when I set out in the morning, I have a full battery and a range of around 240 km. I hear people talk about range anxiety, but the question I ask people is if they ever really drive more than 240 km in a single day? I certainly very rarely drive that far. Of course, a lot of the time I have had the car has been characterised by COVID public health regulations and less visits to Mayaro or Point Fortin, but even then, the range is just about sufficient. In addition, the car comes with a mobile charger that can also be plugged into a simple 110 V outlet for a top-up. The charger I have at home will take the battery from empty to full in about 4 hours, with the slow charger taking up to 8 hours. The fast charger installed in Preysal will do the job in about 30 minutes.

I actually suffered from a lot more "range anxiety" when I had an internal combustion engine (ICE) vehicle. Admittedly, this is mainly because I am one of those annoying people who both let their tank get close to empty and also rarely carry cash; so I was always worrying about finding a gas station that took credit cards before I finally ground to a halt. Now, I start out each journey from home on a full battery.

While I was really pleased to be the first official user of the new fast-charging station, and I like the sense that my car is running on solar power electricity (rather than natural gas-powered electricity), the reality is that the most important charging infrastructure for EVs is already in place in the vast majority of households: namely the electricity grid. Once people park in their driveway or garage, charging from home is easy and on a small island, an extensive public charging infrastructure is not necessary. It is also very cheap compared to any ICE, even if electricity prices tripled. Plus, there are foreign exchange advantages, given the fact that EVs do not

need imported gasoline or diesel and a lot less, imported spare parts.

Given that the availability of public charging stations is not a major constraint on the adoption of EVs in small island states, we need to be careful that we don't concentrate on public policy issues dictated by the concerns in large continental states like the USA. The biggest issue to solve here, is the availability of a range of EVs with a price point where they will be attractive to most consumers. Removing the taxes is therefore a very welcome development. If this were tied to a policy from the government to prioritise procurement of EVs for their fleet, then I think we would see dealers bringing in many new options. Perhaps this is an area where coordinated procurement decisions across CARICOM governments could be very useful.

One of the push backs against EVs that I hear in Trinidad & Tobago is the fact that they run on fossil fuels, as our electricity is almost entirely from natural gas. While this is true (unless you routinely use the new solar-powered fast charger), it is also true that the combination of the huge generation turbines in power stations and the electric motor in each vehicle is a far, far more efficient way of delivering energy to the wheels of a car than individual ICEs burning gasoline or diesel. So, the carbon footprint associated with each kilometre driven is significantly less, not to mention the improvements in air pollution, especially for people living near major roadways.

Clearly, the bigger picture, however, is that if we really want to move to reduce the carbon footprint of transport, we need to move away from private cars to public transport. At the moment, a wholesale shift towards public transport seems like a stretch in Trinidad, given the high vehicle ownership rates and the very real fears about crime and security. But reliance upon public transport (or at least the shared taxi version of "public transport" that we have) is a reality for many of our citizens and the objective of transport policy should be to get more people out of cars, into reliable public transport and walking in our urban areas (which incidentally could have very positive public health benefits given the prevalence of obesity and heart disease). But in the meantime, I will take the step forward with the tax removal as a small victory along the way to a sustainable transport system.



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Governance: a sustainability imperative

Venishea Paynter | Contributor

Sustainability starts with robust governance

Sandy Eapen, Former Manager at BSR™, an organisation of sustainable business experts that works with a global network to build a just and sustainable world stated that:

“Successful integration and effective management of sustainability at a company requires having committed leadership, clear direction, and strategic influence—and none of this will happen without a robust governance structure.”

(Eapen, S., BSR™, 2017)

The need for robust governance structures as a critical part of any organisation's sustainability strategy is well recognised. Sustainability, in this context, is about organisations, nations, and individuals positioning themselves to sustain their current activities into the future without compromising the well-being of future generations. This positioning process involves conducting an impartial, frank evaluation of the Company's vision, purpose, strategy, and the activities it has committed to undertake to deliver on its chosen strategy.

A necessary part of this exercise must also include a careful review and assessment of the governance structures and activities which exist, or should exist, within the organisation, to support the achievement of the organisation's strategic goals.

Governance is core to ESGs and SDGs

This focus on governance is supported by rapidly growing stakeholder interest and pressure for businesses to become more transparent and accountable for the Environmental, Social and Governance (ESG) impacts of its products, services, and operations.

The term ESG was first used by the United Nations in its 2006 Principles of Responsible Investment Report to introduce the criteria required to be incorporated in companies' financial evaluations (Atkins, 2020) and companies across the globe have been increasingly adopting the principles underlying the ESG evaluation criteria.

In 2016, the United Nations' Sustainable Development Goals (SDGs) of the 2030 Agenda officially came into force. The SDGs outline 17 targets geared towards ensuring a sustainable future for all. These targets cover several areas, including governance, environmental and social goals. The ESG elements and SDGs have been influential in shaping the sustainability landscape and the way that companies approach activities in the environmental, social and governance spheres.

The principles underlying the ESG evaluation criteria have become a part of the *zeitgeist* of the current business era. The elements of ESG are viewed as key drivers of sustainability, inextricably intertwined with a company's economic viability, social and societal impact, financial and reputational risk management.

Choosing to ignore ESG/SDG concerns is therefore risky business.

Integration of the ESGs and SDGs

For many companies, a convenient place to start integrating environmental and social elements of ESGs/SDGs into its business model, is through its Corporate Social Responsibility (CSR) and Health, Safety & Environment (HSE) programmes.

While it is a crucial part of this integration process that elements of the ESGs and SDGs criteria guide the focus and activities of these areas, to achieve true sustainability, they must also be ingrained in the strategic direction of the organisation.

The governance element of the SDGs/ESGs, particularly where they are not also rule-based, are not always easily adopted into the organisation's structure, resulting in many cases in governance receiving less attention than it deserves. Having a focused unit, committed to providing governance related support and guidance to the organisation, to assist in the achievement of its governance-based ESG/SDG goals, is a key element for success in this area.



Sustainability ... is about organisations, nations, and individuals positioning themselves to sustain their current activities into the future without compromising the well-being of future generations.

In pursuing integration, a second fundamental consideration is whether the existing systems and reporting structure of the organisation, will deliver the type of change required to set it on a trajectory to a desired future state in which stakeholder expectations, based on ESG/SDG considerations, are met. If not, it should be determined whether incremental or transformational changes are required.

Incremental changes may be required where the current business strategy, structure and operations, remains largely intact, requiring only slight adjustments in order to meet the organisation's sustainability goals. Transformational change requires a major or disruptive strategy, supported by “top-down” leadership and in is driven by issues that are most ‘material’ to the business and its key stakeholders, including the economic, environmental, and social risks that could affect reputation and ability to create value over the short, medium, and long-term.

NGC and governance

Governance occupies a prominent place in NGC's business strategy and operations, as one of its ‘Big Five’ critical focus areas. It forms an essential part of the foundation upon which to build a sustainable organisation. NGC, believes that good governance is good business, and it is the starting point for the realisation of the dream of long-term sustainability.

Cognisant of this fact, NGC is nurturing a culture in which beliefs, values, attitudes, and behaviours demonstrate strong governance orientation. This is visibly displayed in The NGC Group's Core Values.

Governance is also integrated into all aspects of NGC's operations, as it is recognised that governance principles must underpin all our business transactions, operations, and stakeholder interactions. To this end, in 2018, NGC formed the Corporate Governance and Compliance (CGC) Division to complement the work of other critical risk-mitigating units.

A Governance and Compliance Framework, built on the pillars of accountability, fairness, transparency, and independence, has been developed to guide the organisation's internal and external operations. The Framework allows the required focus to be placed on the development of the key areas identified in the framework structure.

NGC's focus on governance enables it to identify and manage various types of risks. For example, compliance with applicable laws, regulations, and state guidelines aids in mitigating financial, reputational, and stakeholder/regulatory risks. With the guidance provided by ESG, risks associated with executive compensation, bribery and corruption, political lobbying and donations are also

identified and alleviated. Internal policies and procedures such as the Business Practices and Ethics Policy, Anti-Fraud Policy, and the Delegation of Authorities Manual guide the activities of stakeholders, while the Whistle-blowing Policy and Procedure inaugurates the “speak-up” culture in NGC.

NGC is committed to engaging with internal and external stakeholders in a consistent, transparent, legal, and equitable manner. This allows the company to maintain its social license to operate, while protecting its reputation and brand. The implementation of key policies and procedures (for example, addressing procurement, human resource and HSE practices) together with a robust compliance and audit programme, properly aligned with Governance best practice and NGC's sustainability strategy, also contributes to the company's effective risk management and its ability to achieve its SDGs.

Governance and business

The heightened focus on governance and compliance is already bearing fruit across NGC and its subsidiary companies. Over the period 2020-2021 alone there has been:

- i) increased engagement of the CGC and Audit Divisions to provide assurance on key policies and procedures, allowing for greater consistency in the documentation of key policies and procedures, improved corporate record retention and retrievability and compliance monitoring.
- ii) the development of a clear graphic depiction of The NGC Group structure to clarify the relationships among companies within The NGC Group and the areas in which they operate. This has allowed for improved subsidiary governance. In keeping with our core value of Transparency, this information is published in the NGC's Annual Sustainability Report, which has been produced since 2017.
- iii) the development of governance-aligned Board Protocols and Terms of Reference (TOR) for all NGC's Board sub-committees which are currently being disseminated throughout The NGC Group to ensure an aligned group approach to Board governance.
- iv) the undertaking of sensitisation initiatives to improve the understanding of NGC's Conflict of Interest (COI) Online System and reporting requirements. In 2021, Leadership will consider mitigating measures and controls related to risks identified during the 2020 COI Declaration Cycle.

Governance and sustainability

The NGC Group has adopted the SDGs, and these are being continuously integrated into corporate activities and culture. The Group is building its sustainability house with governance at its foundation. As the organisation continues to pursue its internationalisation strategy, governance will boost growth potential in a tangible way by demonstrating commitment to the principles of sustainability set out in the SDGs.

NGC is known to be a reputable organisation that approaches its business operations in good faith, upkeeps its contractual obligations, maintains reporting in accordance with applicable laws, regulations, standards, and guidelines. NGC is also committed to creating a working environment that is safe and inclusive. NGC supports a compliance culture and operates transparently (without prejudice to contractual confidentiality requirements), for the benefit of its shareholders—the Government and people of Trinidad and Tobago.

NGC recognises that the concept of governance must be all encompassing and pervade the organisation top-down as well as bottom-up. All NGC's employees can, and do, play a part in building and sustaining a culture of governance. In this way, the NGC will be able to create a business that can withstand scrutiny, is aligned to international standards and practices, and achieves sustainability in the long term.

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Welcome to the new hydrogen economy!

Alicia Taylor | Contributor

Green hydrogen is the new kid on the block in the renewable energy space. It's generated through the split of hydrogen from oxygen in water using a renewable source (solar, wind energy or hydropower), causing no emissions from this process.

Hydrogen is the clean energy source that could help hasten the achievement of net-zero emissions. Green hydrogen, that is.

As the world seeks to recalibrate in terms of accountability to the citizenry and in favor of making more responsible environmental decisions to limit climate change, there is a global move towards implementing the 'energy transition' catalyzed by countries' commitments under the Paris Agreement to reduce carbon emissions.

Many are familiar with wind and solar energy, but few know much about hydrogen. Or so they think! It may surprise you to learn that, in fact, you have known about 'grey hydrogen' for a long time. It is produced using fossil fuels, including natural gas, releasing carbon into the atmosphere—almost all the hydrogen currently produced worldwide is 'grey hydrogen'.

This is used in the chemical industry to make ammonia and fertiliser and for oil refining. After all, hydrogen itself is a non-toxic colorless gas and is the most abundant chemical element in nature.

'Green hydrogen' is the newest entrant in the renewable energy space. It's produced via electrolysis, using an electric current to separate the hydrogen from the oxygen in water. If this electric current is produced by a renewable source (solar, wind energy or hydropower), the clean hydrogen produced is known as green hydrogen. There are no emissions from this process.

The same green hydrogen can be obtained using waste heat. Waste heat is produced by a machine, or other process that uses energy: think of your laptop, and how it heats up sometimes. Waste heat is an abundant by-product of electrical generators or industrial processes, such as steel or glass production. The burning of transport fuels is also a major contributor.



One can also take municipal solid waste – the rubbish thrown away by homes and businesses – as well as plastics and hazardous medical waste and convert them into green hydrogen.

So, what's the impact? Green hydrogen is gaining momentum, and many believe that our future lies with it. When produced through electrolysis, it can be stored, transported and processed for a growing range of uses. It can be used to generate electricity.

Consider this: with wind and solar energy there will always be intermittency issues, and battery storage solutions are still considered to be expensive; with green hydrogen, intermittent renewable energy can be stored and transported and then used when needed. Of course, it's also used as a feedstock to produce green ammonia and methanol.

Industries such as steel, aviation and long-haul sea and road transport (trucks and rail) will benefit greatly from green hydrogen as there is no obvious alternative to achieve decarbonisation. Its greatest advantage is that it burns clean, leaving only water vapor behind.

It can also be easily transported via gas pipelines in country and exported by ship and pipeline channels. In Trinidad and Tobago for example, we have a well-developed petrochemical sector and,

as such, the existing infrastructure can expedite green hydrogen's role in the energy transition.

At this stage, we're still talking about a nascent industry, so the cost of green hydrogen relative to other energy substitutes such as wind or solar energy (with fast-declining prices in recent years), remains fairly high. However, many believe that the cost curve will come down just as solar and wind prices have. It's just uncertain how soon.

Some experts expect it to be a multibillion-dollar export industry business. And there seems to be a race to be first to market globally. Trinidad and Tobago's private sector, in conjunction with the national government, has been making progress. Chile's government has approved its National Roadmap for Hydrogen Development and is launching a fund to support that effort. Other Latin American countries such as Brazil, Costa Rica, Colombia, etc are throwing their hat in the ring.

The question now is how to advance green hydrogen economies. Good policy-making is needed, as well as donor and/or government funding to help offset the high costs initially. Hydrogen studies are indeed requisite and, to that end, the IDB Group has been supporting. In-depth feasibility studies are also needed to ensure a project's bankability. Scalability is a must.

In this regard, IDB Invest is a strategic partner in the advancement of the hydrogen economy in the Caribbean and Latin America, supporting private companies and government agencies. In addition to financing, IDB Invest offers technical and advisory assistance and can tap into donor funding where available to support such key projects.

If you haven't been following the developments in the hydrogen market, believe me, this is one to watch!

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Accountability: a recipe for order



Professor Sterling Frost | Contributor

Chaos is contagious

In physics, **entropy** refers to the degree of disorder or randomness in a **closed system**, i.e., energy within that system being less organised overtime towards work. Organisational Development experts see the organisation as a system that can experience entropy. For example, the *Harvard Business Review*, in describing an entropic process proffers that as organisations grow larger, they become insular and complacent. People tend to focus more on avoiding mistakes and securing their own positions than worrying about what customers care about. Here, counterintuitively, bureaucratic structures create disorder and breakdown due to humdrum routine and the use of these structures to obfuscate a lack of ownership. To reverse this, the organisation should be configured as a more organic and **open system** to facilitate the injection of new energy and thinking.

The author posits that organisational entropy is self-reinforcing, as the bureaucratic machine drives apathy, which in turn further closes the system to outside influences. The individual and collective cannot simply lift themselves out of this chaos; as such, leaders must calibrate social forces toward inspiring emergent order. In this vein, other authors suggest levers for lifting the organisation out of entropy such as refreshing one's team with outside hires, rotating managers, employee involvement, and facilitating experimentation and collaboration. These levers require a fulcrum, and **the fulcrum is accountability**. This may seem counter-intuitive at first as one associates accountability with hierarchical cultures; however, accountability is required to foster innovation.

Figure 1 - Lever for lifting the organisation out of chaos

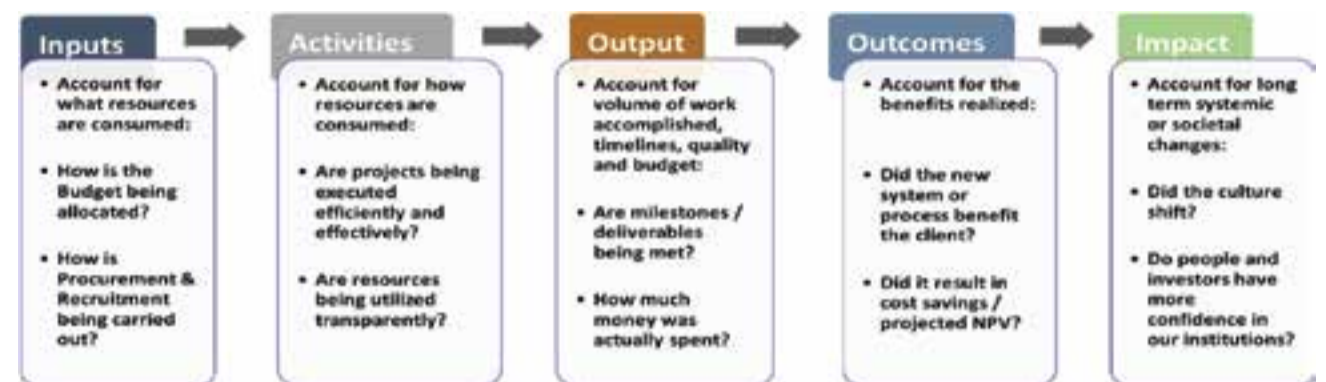


Accountability as an Institution

Strong institutions have systems of accountability deeply rooted in all their mechanisms. Institutional accountability can be reduced to three components: Responsibility, Answerability and Enforceability:

1. **Responsibility** is agreement and acknowledgement of someone's (e.g. an employee) duty in terms of a scope, duration and quality. This responsibility must have **clarity** for accountability to exist. This speaks to **who** is responsible for **what**, and requires a SMART (specific, measurable, achievable, relevant and time-bound) objective. In some domains such as project management, the RACI (Responsible, Accountable, Consulted, Informed) matrix makes the distinction that while more than one persons can be responsible for completing a task (e.g. via delegation), only one person can be answerable for that task, i.e., **accountability cannot be delegated**.
2. **Answerability** deals with the fact that someone responsible has to be **held to account** via some mechanism by which information flows from the person to stakeholders (e.g. shareholders of the organisation), or agents of the stakeholders (e.g. a board of directors). What the accountable party is answerable for can sometimes be obscure, especially if responsibility is given in the context of closed systems or bureaucratic silos (sub systems). The

Figure 2 - What information should be made transparent



logic Model (Inputs, processes, outputs, outcomes and impact) can help stakeholders identify what accountable persons should answer for.

The mechanisms for answerability can be manifested in an organisation's reporting and governance systems and should seek to make the right person accountable for the right things.

3. **Enforceability** then deals with consequences. Answerability provides the information to those who enforce accountability. Answerability without enforcement undermines accountability. Enforceability acts as reinforcing feedback in the organisational system. Effectiveness reinforced begets more effectiveness. Ineffectiveness must be controlled via limiting reward or even re-assigning the responsibility or role. The mechanisms for enforceability are manifested in an organisation's performance management and even talent management systems.

Accountability as a psychological state

Traditional views position accountability as a state that arises external to the individual, i.e., stemming from contractual arrangements or superior-subordinate relationships. Accountability is also an internal process, and perhaps this is where it ought to start. Personal Accountability is holding oneself accountable and it comes from a **belief and attitude** that you are responsible for your outcomes and the outcomes of your team. Individuals with this **internal locus of control** see themselves as part of the problem and seek to share the blame as opposed to casting it. From a systems thinking perspective, the ultimate personal accountability is perhaps where you see interdependent relationships amongst all actors and outcomes in the system, as such you cannot isolate yourself from any failure. Personal Accountability starts with self-awareness about your own shortcomings. Lack of personal accountability can manifest knowingly or unknowingly in different forms including: 1) over delegation of matters in order to distance yourself from failure; 2) repackaging of issues to detract culpability; or 3) pointing out past record of accomplishment or unrelated successes to maintain moral congruence.

Personal Accountability in employees can be fostered or stymied by several factors (or lack thereof):

1. **Employee Engagement:** While responsibility is imposed contractually, a sense of ownership should be fostered. Engagement can reverse apathetic sentiments arising from an entropic environment. Via coaching, cultivate a sense of ownership by aligning the organisation's objectives to the employee's. Do not broad-brush engagement, but instead tease out causes of apathetic attitudes by exploring situational determinants.
2. **Clarity:** Clear success criteria needs to be agreed upon at the start of work activity. Also discuss and clarify interdependencies amongst deliverables of other accountable parties and identify where there may be emergent accountability that has not been assigned to an individual. There should also be clarity in feedback to employees at regular checkpoints about expectations and performance; as opposed to blindsiding employees long after an issue has gone out of control.
3. **Confidence:** Build confidence in employees to invoke ownership. Confidence can come from competence. If an employee is competent at a particular activity, s/he will more likely own it. Close gaps in competencies or reassign work accordingly. Employees also become more confident when they are allowed to fail. Being held to account should not necessarily be a punitive exercise but one where

support is provided to close gaps.

Accountability as a culture

Personal Accountability is reinforced more so by the culture in which the individual exists. This is key to breaking free of entropy. An individual's sense of personal accountability in isolation can be easily extinguished if his/her worldview is not resonating with the system around them. In the same vein of clarity and SMART goals, one ought not to hold persons accountable for things that are totally beyond their control, as this is setting individuals up for failure. However, a major barrier for shifting culture is where one only holds persons accountable for things fully in their control. This requires a shift in perspective from an organisation with fixed boundaries to instead seeing the organisation as existing within a wider transactional environment that one can influence. For example, you may not be able to control a supplier's tardiness, however, you ought to continuously refine your contractual arrangements or service level agreements.

This culture should be fostered by allowing individuals to step outside of their boundaries without the risk of failure; i.e., provide a safety net for experimentation around solutions that can potentially lead to greater effectiveness. This safety net will allow people to assume more stewardship for outcomes that have no clear owner. This is a balancing act, as you cannot remove enforceability for business-as-usual deliverables. However, with respect to innovation, accountability must take on a different form as there is no centralised approach to innovation. An Accountability culture is where persons take ownership of both success and failure, as such, accountability actually empowers innovation. Here is how one can create a culture of accountability:

1. **Embed Accountability in your strategic framework.** Culture transformation starts with your strategic themes, goals and organisational values.
2. **Alignment:** Leverage institutional accountability to your advantage by aligning individuals' goals to organisational outcomes and even enforcing team goals in individual performance appraisals. This will nudge individuals to connect the dots and influence the wider environment.
3. **Reinforcement:** Openly reward and recognise where Personal Accountability is demonstrated.

The Accountability of Leadership

The contrasting phenomenon to entropy is 'self-organisation' which is referred to as **Spontaneous Order** in the social sciences. This refers to some order that emerges out of random interactions amongst self-interested individuals under the right conditions. While the technocrats argue that unlike organisations, "spontaneous orders" are not created or controlled by humans; the author posits that leaders can foster the right conditions for a more open system through accountability. Leaders must have a nuanced and fluid view of accountability incorporating all of the aspects of accountability discussed herein in order to lift the organisation out of chaos. Holding others to account in itself is an accountability. This takes persistency, transparency and courage because holding others to account now puts the leader in the spotlight for providing the support and clarity to employees. Ultimately holding others to account means that you are no longer separating yourself from the outcomes produced by others.

Carbon capture utilisation and storage, an opportunity in the making

Ricardo Panchorie | Contributor

As the world takes the necessary steps towards “net zero” emissions by 2050, governments around the world are instituting new restrictions/penalties on emissions from Industry. There is also a forecast increased demand for industrial products with a lower carbon footprint e.g. “blue” ammonia, cement and steel. Carbon Capture, Utilisation and Storage (CCUS) is one of the methods identified to help industry reduce their emissions and so avoid penalties associated with emissions restrictions, while at the same time allowing them to market their products as “blue”, which command a premium price. The expected increase in global demand for CCUS as well as “blue” products provides an opportunity for Trinidad and Tobago to earn foreign exchange via carbon sequestration and increased oil production via Enhanced Oil Recovery (EOR), and to futureproof the local ammonia/cement sector by facilitating the manufacture of “blue” products.

From a technical perspective, CCUS involves the capture of CO₂ typically produced by industrial activity. Once captured, the CO₂ is then transported via pipeline to a site that has low production or depleted oil/gas wells, where it is injected into reservoirs for EOR or stored long-term in appropriate geologic formations.

From a commercial perspective, countries that have enacted limits for CO₂ emissions have provided a driver for polluters to take action to reduce their carbon footprint either by the application of new technology or processes that emit less CO₂, paying to have their CO₂ access a CCUS system or purchase of Certified Emissions Reduction (CER) units (carbon credits) from an Emissions Trading Scheme (ETS).

The Ministry of Energy and Energy Industries (MEEI) has over the years taken steps towards understanding what is required



to set up a CCUS facility in Trinidad with the aim of increasing oil production and generating income via the sale of CER units. Building upon the work that has already been completed, the next steps are:

1. The creation of a National CO₂ Storage Atlas, which will identify the number and size of suitable underground reservoirs that can be used to store CO₂.
2. Government policy and associated regulatory framework to set up an ETS, with ties to internationally recognised ETS institutions and meaningful penalties for emission of CO₂ in excess of permissible limits.
3. The CO₂ gathering infrastructure (pipelines, compressor stations etc.) to allow companies that generate CO₂ the opportunity to access the local CCUS system.
4. Additional infrastructure and port facilities to handle shipments of liquid CO₂ from outside of Trinidad.

For local companies, the ETS will grant a limit on how much CO₂ they can produce annually. To drive efficiency and innovation, this limit decreases every year. If companies exceed this limit, they must either pay the requisite penalties, purchase CERs on the ETS or send their CO₂ to the local CCUS facility. Companies that access the CCUS system can also market their products as “blue”.

A local ETS with ties to other international ETSs and port facilities to handle liquid CO₂ creates the opportunity for Trinidad and Tobago to earn valuable foreign exchange via geologic carbon sequestration. A good example of CCUS as a profitable business model is the Northern Lights project being planned by Equinor. This project will be the world’s first cross border CO₂ transport/storage facility. It will be designed to accept CO₂ shipments at its onshore facility from customers outside of Norway, and then pump and store the CO₂ in offshore reservoirs on the Norwegian continental shelf.

As the world progresses towards a lower carbon future, the expected increase in demand for CCUS and products with a lower carbon footprint will continue to strengthen the case for a local CCUS facility. If suitably sized reservoirs are identified, this, combined with the country’s existing technical capability/capacity, will position Trinidad and Tobago to become a CCUS hub for the Caribbean and larger Latin American region and at the same time provide an opportunity for the industrial sector to remain export competitive in the manufacture of “blue” products.

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Celebrating a milestone

The Point Lisas Industrial Port Development Corporation Limited (PLIPDECO) was born out of a vision by the South Trinidad Chamber of Industry and Commerce (now the Energy Chamber of Trinidad and Tobago) and engages in three (3) lines of business:

- Port Operations
- Industrial Estate Management
- Warehousing and Logistics Services

The Port of Point Lisas is a multipurpose cargo facility operating on a 24/7 basis. With its six commercial berths, the port handles a wide range of cargo including dry and liquid bulk, break-bulk, containerised and general cargo covering a range of trade and non-trade customers.

The Point Lisas Industrial Estate spans 862.6 hectares and is an integrated petrochemical complex housing over 103 national and international companies operating in oil and gas, petrochemical, power generation, iron and steel as well as a cluster of ancillary and support service companies.

The Company is proud of its achievements and growth over the last 55 years and looks forward to many more years of service excellence to all our stakeholders, shareholders and the people of Trinidad and Tobago.

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 Point Lisas, Couva, Trinidad, West Indies
 Tel: 868 636-2201 Fax: 868 636-4008
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NGC's Train 1 investment—another view



Gregory McGuire | Contributor

On Thursday, 2nd September, the *Trinidad Guardian* published a story about NGC directors requesting indemnity from the state with respect to NGC's investment to keep Atlantic LNG Train 1 alive. Somewhat surprisingly, on Sunday 5th August, the *Sunday Express* picked up the baton and literally nailed NGC and its directors for the "debacle of Train 1". The *Express* editorial concludes that the NGC has made a "disastrous" decision. That \$250 million has been "thrown down the drain". All these condemnations are based on the simple self-serving grounds offered by the big multinationals that they had no gas to supply Train 1.

I feel compelled to join this debate, if only to ensure that our citizens are given a balanced view of the context. The matter of the directors' request for indemnity has been quite adequately and eloquently addressed by Dr. Raj Ramlogan in a social media post. My purpose here is to address the substantive matter of the investment.

Should NGC have injected \$250 million in order "keep Train 1 alive"? First, let us understand what this means. The LNG complex in Point Fortin comprises four LNG Trains. Each Train has a different shareholding arrangement and a different operating model. Trinidad and Tobago, through NGC, has equity in Train 1 (10%) and Train 4. (11.11%).

ALNG Train 1 has been in existence since 1999. As an investment, the shareholders (BPTT, Shell, NGC and China Investment Corp.) would have deemed that the plant would have come to the end of its initial economic life (20 years). To simplify a complex situation, a decision to keep Train 1 going depended mainly on two factors: a new gas supply contract, and some capital expenditure on refurbishment works and ongoing maintenance. The NGC has decided to foot the bill on the refurbishment works to the tune of an estimated \$250 million. Criticism has been levied against this decision on the grounds that the large producers have indicated that they have no gas for Train 1.

As a nation, we have been in the business of hydrocarbon industry for over 115 years. We know, or ought to know, that more often than not the interests of the multinationals are not in sync with the national interest. Therefore, it is quite naïve to accept as fact that Train 1 must be closed, simply because the multinationals say that they have no gas. These are the same multinationals that have gas for Trains 2, 3 and 4! So let us dig a little further as to why "keeping Train 1 alive" may be in our best interest. There are several reasons:

1. **The greatest incentive for stimulating new exploration for natural gas is the existence of a market.** Train 1 requires a supply of approximately 400 million cubic feet per day. In a reconfigured business model, a refurbished Train 1 provides a ready market for any new discoveries in the deeper waters, which would require a large volume off take agreement for project viability. For example, gas on the North Coast was discovered in 1970s and remained stranded for twenty years before the investment in Train 2 and 3 provided sufficient volume to justify the larger investment in upstream infrastructure. The rapid growth in E&P activity in the 1990s, which followed the approval of Train 1 investment, was due mainly to the availability of a new market for gas.
2. **There are significant gas prospects out there to come to market.** BP, Shell and BHP have made commercial discoveries over the last two years. While most of this is committed under contract to the domestic market, there is no doubt that more will be found in new and old horizons. Listen to what BP had to say following a recent discovery: "The Columbus Basin is a maturing province, but the Ginger discovery demonstrates that with the right technology, we



NGC's Office in Couva, Trinidad

can continue to uncover further resource potential in the basin". In addition, new discoveries made on land in the Ortoire Block by Touchstone have improved prospectivity and ignited interest on land. Over the medium-term, several sources of proven gas are waiting to come to market. These include the Loran Manatee field, the Dragon field and other Venezuelan prospects. Further afield, discoveries have been made in Grenada, which are also awaiting commercialisation. BP and Shell are important, no doubt about that, but they are not the only game in town.

3. **Train 1 gives the State the flexibility to monetise gas from any upstream company.** Both Shell and BP would want all gas to be monetised through Trains 2 and 3, where the fiscal terms and business model are more favourable to them making supernormal profits with less than an optimal share coming to T&T. As indicated above, T&T has no equity in Trains 2 and 3. In such situations it is possible and legitimate for both BP and Shell to vote against any other producer wanting to supply gas to these trains.
4. **There are currently intense negotiations ongoing about the unitising of the ALNG Complex.** The media seems to cast doubt on this, but seems very willing to accept the BP-Shell statements about no gas availability. These negotiations are meant to ensure a much better take for T&T from future LNG sales from a more efficient merged operation of the LNG plants. It would be both imprudent and inappropriate to make these public discussions as requested by the *Express*. Taking charge at Train 1 strengthens the Government position in these negotiations.
5. **What the NGC did was in keeping with its mission to derive exceptional value from our gas resources.** The investment in Train 1 was in keeping with its strategic intent to build a world-class diversified energy portfolio. Energy business is a high risk business. Contrary to the view that NGC is merely a gas merchant and pipeline, the company now owns significant upstream assets. These include the recent acquisition of Heritage share of Block 3A, bringing its share in that development to 31 per cent. This provides access to both equity gas to address a major strategic weakness and equity crude to boost its trading business.

Our media editors and others have failed to take any of the above into consideration and are shamefully castigating the NGC on the very simplistic grounds that BP and Shell said that they have no gas to supply. Post 1970, T&T citizens embraced the idea that as an independent nation, we needed to take control of the commanding heights of the economy. Our record thus far is unremarkable. With the closure of the Petrotrin refinery we have walked backward in the oil sector. The NGC is our last hope for realising this dream in an industry that continues to be our lifeblood, notwithstanding the winds of change. Energy investments require taking significant risks if we wish to reap the rewards. We cannot "play mas but fraid powder". Let us not continue to shoot ourselves in the head!

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T&TEC data as a policy tool

Dax Driver | Energy Chamber CEO
[@dax_driver](https://twitter.com/dax_driver)

The strategy of using a household's T&TEC electricity bill as a way of targeting support to the neediest households, is an interesting and innovative policy development. This is something that the Energy Chamber recommended to the Roadmap to Recovery policy development process in 2020, in the midst of the first wave of the COVID pandemic. There is a strong correlation between household income and electricity use. This means that it makes good sense to use electricity bills as a method to overcome the vexing issue of means testing and to avoid the moral hazard often associated with cash transfer or food card programmes, where better off households with the right political or social contacts access the support, rather than the households most in need.

There may be some parsimonious but wealthy households with low electricity bills, but rewarding those households for not wasting electricity (and hence natural gas) does not necessarily seem a bad public policy outcome. There are of course, also a few indigent households with no electricity connections, but this is where local councillors are supposed to come in, to target the needed social support to these few highly impoverished households.

The existing T&TEC web interface giving people rich data about their electricity usage is a very useful tool for households and businesses trying to manage their electricity costs. The well-developed T&TEC geographical information system, coupled with their household billing database, could also be an excellent physical planning tool. With the right analysis it could help identify pockets of poverty or areas undergoing significant social and economic change. T&TEC's data is a valuable tool and it is good to see it being used in a public policy setting, but this is just the first step.

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Managing your business in a post-COVID world

Steven Samlalsingh | Contributor

The global vaccination effort continues, in a race against variants and further spread and not for the first time, case and death numbers dip. This time, with increased protection, many can exhale a collective sigh of relief as we breathe fresh air and return to a life of new normalcy. Like every good thriller, however, there is a gnawing feeling of a twist in the tale. As business doors reopen and cobwebs cleared, we know that it won't be business as usual.

If your business is still standing after the last twenty months, then you are definitely in it for the long haul. Congratulations to you and your team. Spare a thought for those who didn't make it this far and if possible, as you dust off your shelves and consolidate your position, reach out to your fellow merchants or service providers and help them pick up the pieces. The business sector needs a resurgence. The more businesses that can return to the marketplace, the better for the nation's economy in terms of employment and trade.

The key threats to businesses today are pandemic-related. Since February 2020, the collective landscape and mindscape have changed dramatically as a result of COVID-19. Potential threats cannot be ignored, procrastinated or pushed under the carpet. As a business leader you need to identify and assess these threats, assign risk levels, prioritise and develop mitigation plans and execute.

A good leader will spend time assessing the organisation's assets, environment and key stakeholders, running scenarios and simulations. This preparation and planning puts you in good stead to deal with upcoming business continuity issues. A state of readiness builds self-belief and inspires confidence in your team and clientele.

The current, major business issues affecting most organisations are identified below. Recognising these challenges and addressing them head on is a positive way to return to the business place.

Adaptation to a recurring pandemic environment

It is fair to say that there remains a lingering anxiety about what next. Every morning we furtively study the numbers and scan the headlines for mention of dreaded terms such as "variant, spike, new strain, wave" and other depressing words coined in the pandemic nomenclature. There will be future pandemics in various forms and it would be colossal shame to waste the valuable learnings of the past twenty months.

To be relevant and ready you must be agile and swift. The pandemic showed us that those who adapted quickly survived the onslaught of the lockdowns. The impact of the pandemic will be with us for years to come. We have adapted social behaviours and business processes and practices.

Whilst not advocating fear-mongering, we need to be one step ahead with remote work arrangements, monitored entry, social distancing, online communication, delivery systems, e-commerce platforms and various degrees of safety wear from sci-fi looking shields to fashionable masks. Revisiting policies and processes and reorienting your employees is paramount. The most overused cliché of the pandemic, *The New Norm*, is indeed upon us.

Corporate cyber attacks

Whilst not directly pandemic-related, cyber attacks are perhaps the single most significant threat affecting businesses and governments alike today. It's a sleeping giant that keeps many executives and ICT heads awake at night. Many organisations have not declared intrusions, however, there have been numerous events, occurring on a frequent basis. Millions of dollars in cryptocurrency ransoms have been paid by companies to regain control of their data and systems from anonymous, uber-smart, cyber miscreants.

Protecting an organisation's data is not only key for business integrity and continuity, but can impact heavily on a business's reputation. No longer can digital backups, firewalls and free virus software be your sole ICT security policy. Business owners have to assess their ICT systems and acquire the latest tools and techniques to prevent digital attacks. A strategic and tactical response is required: updated ICT security policies, staff awareness enforcement, acquisition of up-to-date systems and software, control system access via cloud, wifi, employee access, and instituting a sandbox environment for simulating code.



Cash flow issues

A perennial problem further exacerbated by little or no business activity for a prolonged period. One of the main reasons many successful companies folded over the last year and a half was solvency issues. To arrest cash flow issues, businesses should examine their controllable and uncontrollable spend and seek to reduce their overheads through cost management of discretionary expenditure, cost-cutting and waste reduction initiatives, and removal of non-value-added activities through business process reviews. Improved customer debt collection and accessing viable lines of credit are also options that can be considered.

Apart from cost containment, one should also be looking at innovative ways of increasing revenue and optimising your asset through diversification and going global, adopting new business tools such as e-commerce, delivery service, packaged goods and even adjustment in business hours and clientele.

Managing business loans and financing arrangements is a major challenge for a company's ability to remain a sustainable going concern in these times. With limited income and marginal fall in fixed costs, companies have been strained to the point of changing its shape. Initiate discussions with your financiers, maybe lobby with other business owners, and seek to come up with mutually beneficial and creative financing plans that can alleviate the pain of strangulating finance costs.

Employee welfare

Never before, in the history of the world, has the global population been mandated to collectively adapt and change behaviours and social practices for sustained periods within a few short weeks! People have been driven to the brink of their mental state. We have been asked to change, in a very short timeframe, to make epic changes in lifestyles and this has stretched the psyche of many. This has been a difficult time.

Apart from conforming with new behaviours, people are worried about their own health and that of their loved ones, their financial situation and job security, their inability to interact socially with friends and family during this traumatic period, and of course the pervading feeling of fear and unease that there remains a looming threat of another pandemic.

A company's most valuable asset is its personnel. Employee welfare is key and employers must do their part to create an environment of comfort and cheerfulness through employee assistance programmes, team activities, morale-building sessions, flexible work arrangements, a safe workplace, and managing the coexistence of vaccinated and non-vaccinated employees.

On the other hand, there are persons who simply aren't ready for team activities—brooding quietly, dealing with depression, suicidal thoughts, insomnia, sluggishness brought on by poor diet and limited exercise. The involvement of professionals may be useful here. Families, too, should be considered, as many homes have seen an upsurge in domestic violence and increased rage-related incidents. Addressing these issues can contribute to a positive and healthy work environment and a less stressed employee.

Increased cost of doing business

All the threats outlined above have inherent costs in putting various measures in place, which must be budgeted for and procured in upcoming periods: cost of personal protection, prevention and detection equipment such as temperature gauges, sanitisers, masks, shields, gloves, desk separators and greater floor space for social distancing. Additional outlay could be required when investing in ICT solutions, enhanced bandwidth, meeting software, websites, and e-commerce platforms. Insurance costs will probably escalate as new risks are defined. Employee costs will climb as a result of increased leave due to illness, additional medical plan subsidies, cost of travelling and overall cost of living impact.

Focussing solely on mopping up operations can be to your detriment. Walls and drains need to be built too. As difficult as it may be to focus on the management of the issues outlined above, it can also prove very helpful to getting back in the game as a key player. Experts suggest that there is light at the end of this long, dark tunnel. As we come out of this period of darkness, it is predicted that an economic boom is on the horizon. Being prepared will allow you to optimise this windfall.

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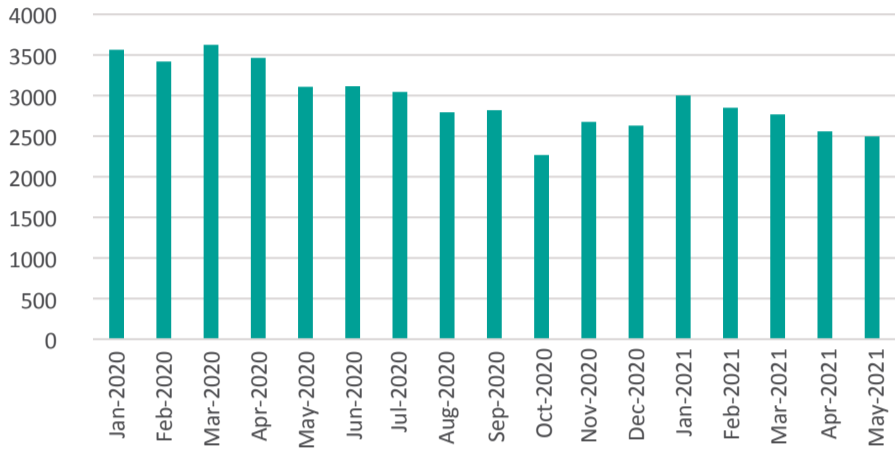
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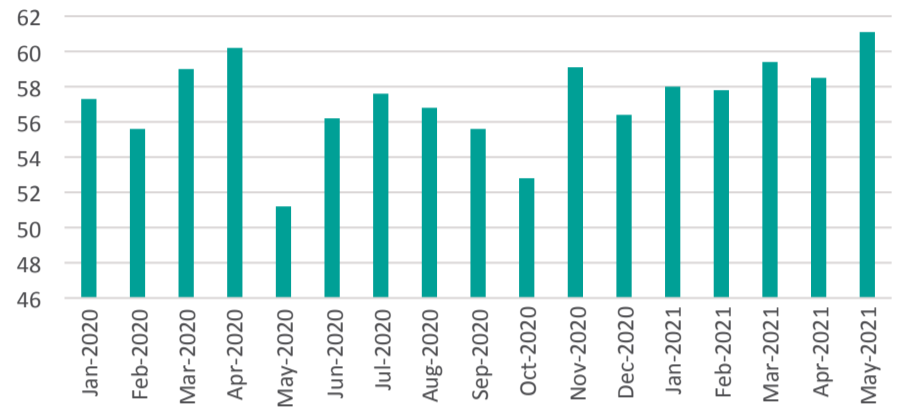
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Monthly Review

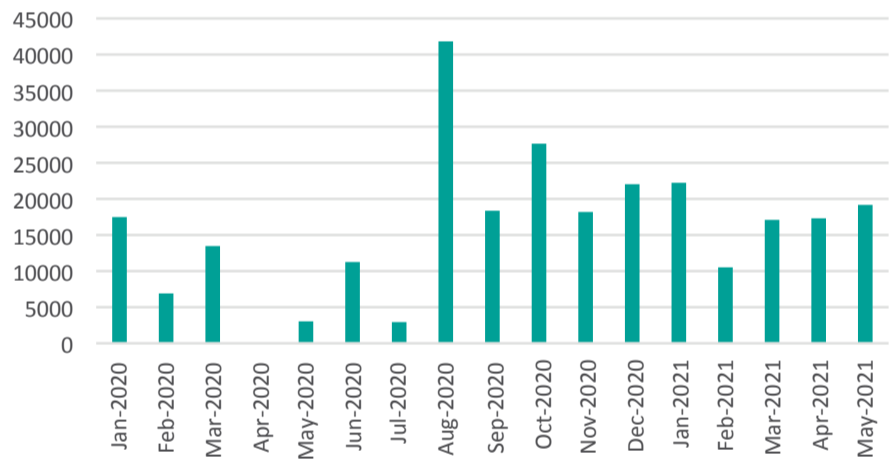
Natural Gas Production (mmcf/d)



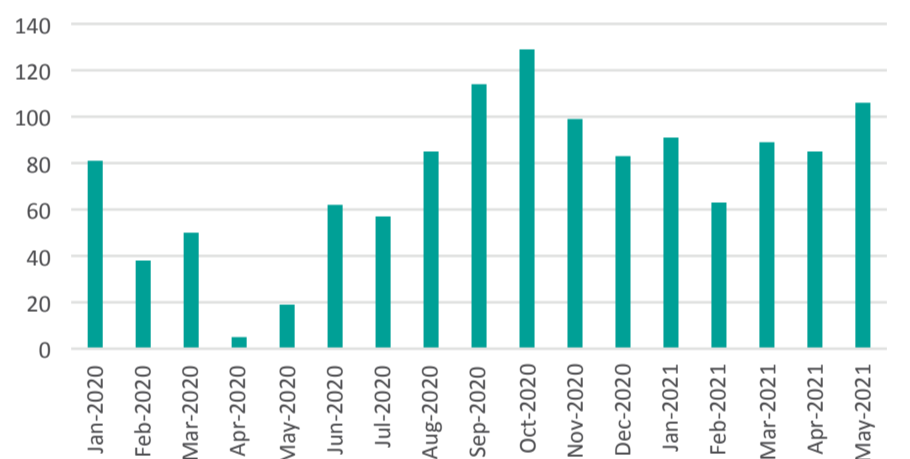
Crude Oil Production Daily Average (000's Barrels)



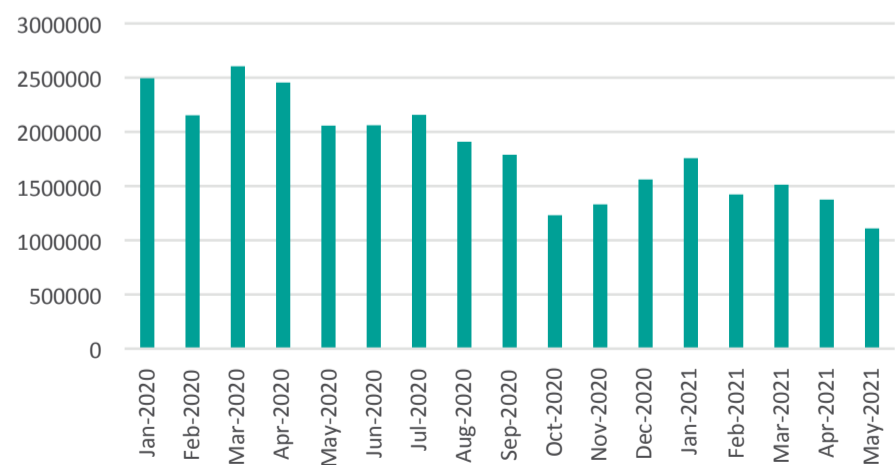
Depth Drilled (ft)



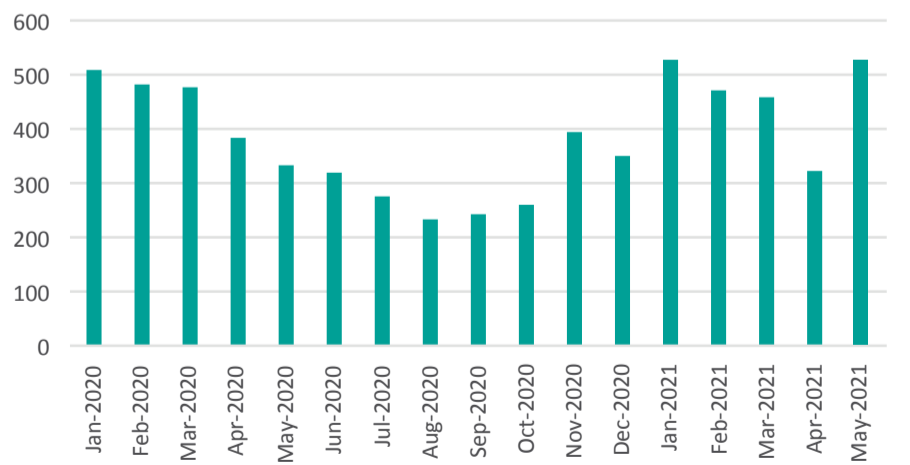
Number of Rig Days



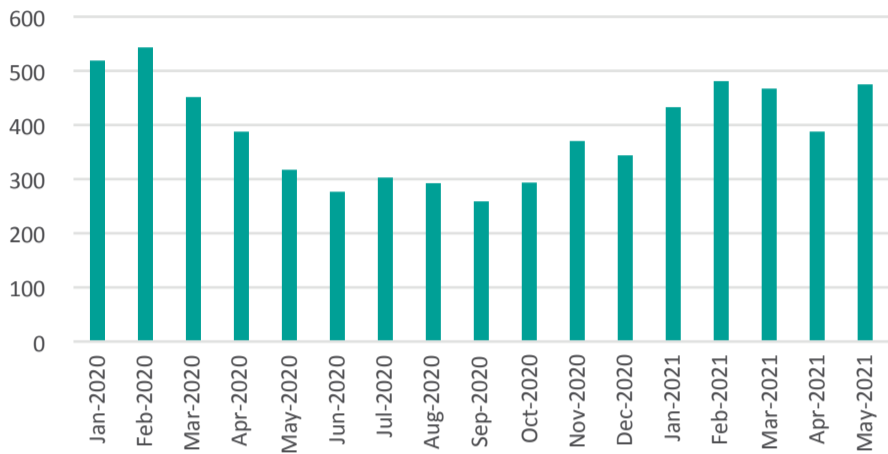
Liquefied Natural Gas Production (m³)



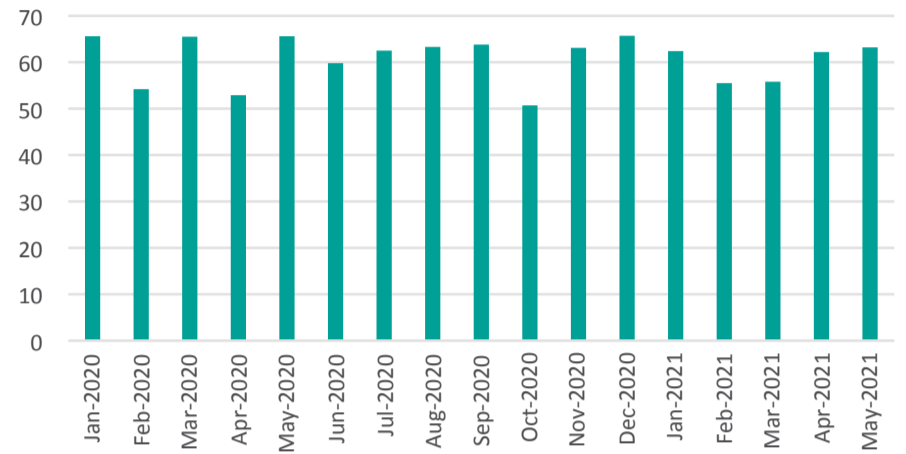
Production of Methanol (000's Tonnes)



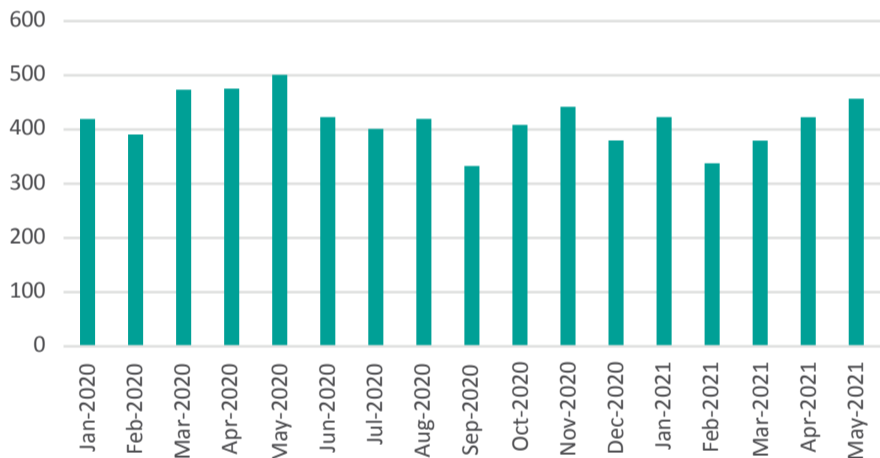
Exports of Methanol (000's Tonnes)



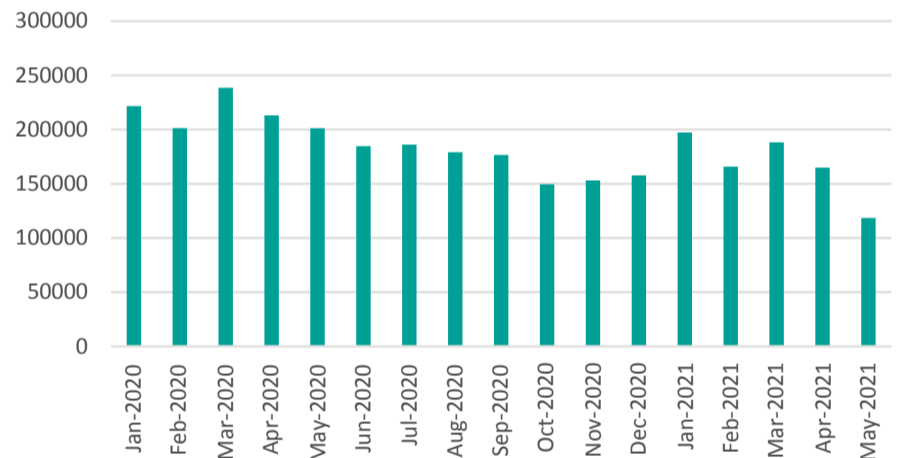
Production of Urea (000's Tonnes)



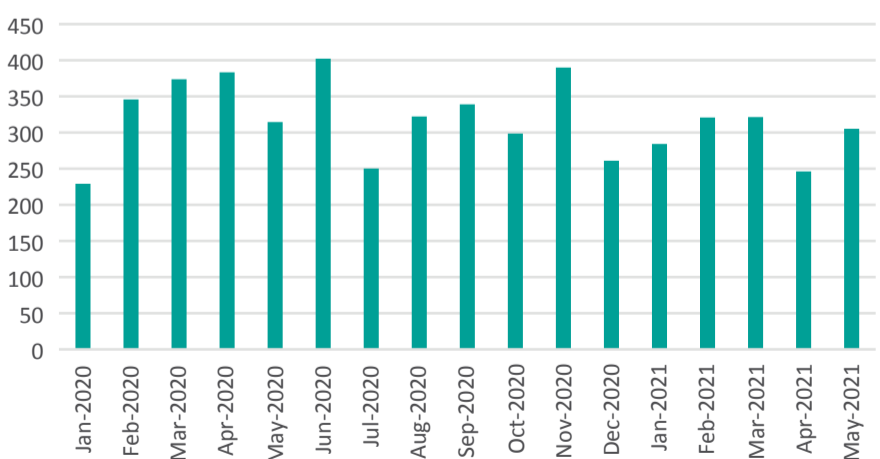
Production of Ammonia (000's Tonnes)



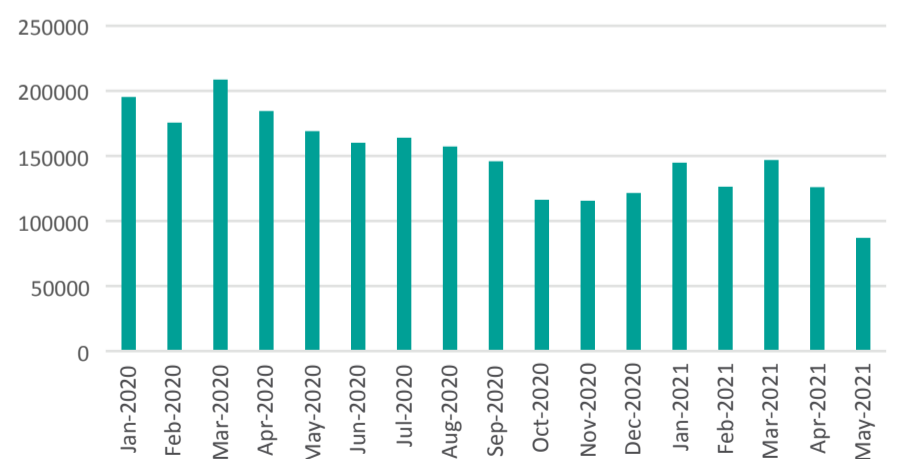
Production of Propane (bbls)



Exports of Ammonia (000's Tonnes)



Production of Butane (bbls)



efficiency

Global Stories

Gulf of Mexico

Gulf of Mexico lease sale set for November

The Bureau of Ocean Energy Management (BOEM) has announced that it will hold an oil and gas lease sale for the Gulf of Mexico on November 17, in compliance with an order from a U.S. District Court.

According to BOEM, the lease sale will include approximately 15,135 unleased blocks located from three to 231 miles offshore in the Gulf of Mexico with water depths ranging from nine to more than 11,115 feet. The latest lease sale, which is scheduled to be livestreamed from New Orleans, will be the eighth offshore sale under the 2017-2022 Outer Continental Shelf (OCS) Oil and Gas Leasing Program.

Brazil

Petrobras to shed stakes in 15 Gulf of Mexico fields

Brazilian oil and gas company Petrobras is selling its interest in a joint venture company that owns interests in 15 offshore fields in the U.S. part of the Gulf of Mexico.

According to Petrobras, this transaction is in line with the company's strategy of portfolio optimisation, debt reduction, and capital allocation improvement, as it increasingly concentrates its resources in world-class assets in deep and ultra-deep waters in Brazil, where Petrobras has shown a great competitive edge over the years.

North Sea

Neptune Energy begins Dugong Tail drilling campaign

Neptune Energy announced drilling has commenced on the Dugong Tail exploration well in the Norwegian sector of the North Sea.

The Dugong Tail is being drilled by the Deepsea Yantai, a semi-submersible rig, owned by CIMC and operated Dugong Tail is located 120km west of Florø, Norway, at a water depth of 320 metres, and is close to the existing production facilities of the Snorre field. The reservoir lies at a depth of 3,200–3,500m by Odfjell Drilling. It is located within the Neptune-operated Dugong Production Licence (882).

Caspian Sea

Lukoil teams up with BP in Caspian Sea exploration project

LUKOIL signed an agreement on acquiring a 25 percent participating interest in the Shallow Water Absheron Peninsula (SWAP) exploration project in the Azerbaijan sector of the Caspian Sea from bp.

The deal is expected to complete before the end of 2021, following its approval by the government of Azerbaijan.

After the completion of the sale, bp will remain operator of the project, holding a 25 percent interest. The third party to the project is SOCAR, the State Oil Company of the Azerbaijan Republic, with a 50 percent share.



Bermuda

Stonepeak to acquire Teekay LNG in a \$6.2 billion transaction

Teekay LNG Partners L and Stonepeak, a leading alternative investment firm specialising in infrastructure and real assets, announced that they have entered into an agreement and plan of merger (the Merger Agreement).

Under the Merger Agreement, investment vehicles managed by Stonepeak will acquire (a) all the issued and outstanding common units representing limited partner units in Teekay LNG, including approximately 36.0 million common units owned by Teekay Corporation (Teekay) and (b) 100 percent of Teekay's ownership in Teekay LNG's general partner, Teekay GP L.L.C., which includes an economic ownership interest equivalent to approximately 1.6 million Teekay LNG common units, for \$17.00 per common unit or common unit equivalent in cash (collectively, the Transaction), representing an enterprise value of \$6.2 billion, including consolidated and proportionate joint venture net debt, and \$1.5 billion in common unit equity value.

The \$17.00 per unit acquisition price represents a premium of 8.3 percent to the closing price of Teekay LNG's common units on October 1, 2021 and premiums of 12.3 percent and 17.5 percent to the volume-weighted average price of Teekay LNG's common units over the last 60 and 180 days, respectively.

Asia

CNOOC announces a large-sized discovery of Kenli 10-2 in Bohai

CNOOC announced that the Company made a large-sized discovery of Kenli 10-2 in Bohai. The Kenli 10-2 oilfield is located in Laizhou Bay Sag in Southern Bohai Bay, with an average water depth of about 15.7 meters. The main oil-bearing formation of Kenli 10-2 oilfield is in the lower member of Neogene Minghuazhen Formation and the oil properties are conventional heavy oil. The discovery well Kenli 10-2-4 was drilled and completed at a depth of 1,520 meters, and encountered oil pay zones with a total thickness of approximately 27 meters. The appraisal well was tested to produce approximately 569 barrels of oil per day.

IRENA and Hydrogen Council forge alliance to scale up hydrogen across the energy system

Staff Writer | Energy Chamber

The International Renewable Energy Agency (IRENA) and the Hydrogen Council, a global CEO coalition, have signed a Partnership Agreement to jointly advance green hydrogen across the energy system and make a significant contribution to global net zero goals.

Signed by Francesco La Camera, Director-General of IRENA, and Daryl Wilson, Executive Director of the Hydrogen Council, the Agreement marks a new milestone in the history of collaboration between the two organisations by combining IRENA's renewable energy expertise with the Hydrogen Council's diverse network of 120+ member companies across the entire hydrogen value chain.

Francesco La Camera said, "IRENA's World Energy Transitions Outlook makes it clear that we have to urgently step-up action on all fronts of the energy transition to achieve our climate and sustainable development goals. Green hydrogen is a critical pillar for decarbonising energy systems. With today's agreement we will significantly increase knowledge exchange and international co-operation and coordinated action in this space."

Daryl Wilson said, "We are united by a shared vision for hydrogen as the enabler for faster and greater integration of renewable capacity, as well as greater cost-efficiency and optimisation at energy system level. The Council's Hydrogen, Scaling Up report shows the key role of clean hydrogen produced through different low-carbon pathways in delivering deep decarbonisation while providing the necessary flexibility and resilience for our energy systems. Public-private collaboration with partners such as IRENA is critical to making this profound transformation happen. We look forward to this next chapter



Francesco La Camera
(Photo: irena.org)



Daryl Wilson
(Photo: hydrogencouncil.com)



IRENA Headquarters in Abu Dhabi
(Photo: woodsbagot.com)

of our partnership and accelerating the transition to net zero together."

With a focus on accelerating hydrogen globally, the two organisations will exchange knowledge, best practice and data, particularly on cost and volumes for electrolysers, policy frameworks, market design, certification systems and technical and safety standards. The Partnership Agreement will also draw on the complementary strengths and communities of IRENA and the Hydrogen Council to achieve the aims of

IRENA's Collaborative Framework on Green Hydrogen. IRENA's numerous frameworks serve as multi-stakeholder platforms for co-operation and co-ordinated action, bringing public, private, intergovernmental and non-governmental actors together to support and accelerate the global energy transformation in relevant areas such as green hydrogen.

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IEA: statement on recent developments in natural gas and electricity markets

Staff Writer | Energy Chamber

The steep rise in European gas prices has been driven by a combination of a strong recovery in demand and tighter-than-expected supply, as well as several weather-related factors. These include a particularly cold and long heating season in Europe last winter, and lower-than-usual availability of wind energy in recent weeks.

European prices also reflect broader global gas market dynamics. There were strong cold spells in East Asia and North America in the first quarter of 2021. They were followed by heatwaves in Asia and drought in various regions, including Brazil. All of these developments added to the upward trend in gas demand. In Asia, gas demand has remained strong throughout the year, primarily driven by China, but also by Japan and Korea. On the supply side, LNG production worldwide has been lower than expected due to a series of unplanned outages and delays across the globe and delayed maintenance from 2020.

"Recent increases in global natural gas prices are the result of multiple factors, and it is inaccurate and misleading to lay the responsibility at the door of the clean energy transition," said International Energy Agency (IEA) Executive Director, Dr. Fatih Birol.

Going forward, the European gas market could well face further stress tests from unplanned outages and sharp cold spells, especially if they occur late in the winter. Gas storage levels in Europe are well below their five-year average but not markedly below their previous five-year lows, which were reached in 2017.

Based on the available information, Russia is fulfilling its long-term contracts with European counterparts—but its exports to Europe are down from their 2019 level. The IEA believes that



Russia could do more to increase gas availability to Europe and ensure storage is filled to adequate levels in preparation for the coming winter heating season. This is also an opportunity for Russia to underscore its credentials as a reliable supplier to the European market.

European electricity prices have climbed to their highest levels in over a decade in recent weeks, rising above €100 per megawatt-hour in many markets. In Germany and Spain, for example, prices in September have been around three or four times the averages seen in 2019 and 2020. This increase has been driven by the surge in gas, coal and carbon prices in Europe. The strong rise in gas prices led electricity providers in a number of European markets to switch from gas to coal for power generation—a trend that would have been more pronounced if it had not been for the increase in the price of carbon emission allowances on the European market.

"Today's situation is a reminder to governments, especially as we seek to accelerate clean energy transitions, of the importance

of secure and affordable energy supplies—particularly for the most vulnerable people in our societies," Dr. Birol said. "Well-managed clean energy transitions are a solution to the issues that we are seeing in gas and electricity markets today—not the cause of them."

The links between electricity and gas markets are not going to go away anytime soon. Gas remains an important tool for balancing electricity markets in many regions today. As clean energy transitions advance on a path towards net zero emissions, global gas demand will start to decline, but it will remain an important component of electricity security. This is especially the case in countries with large seasonal variations in electricity demand.

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Lightsource bp further accelerating growth, now targeting 25GW solar developments by 2025



Harnessing the power of the sun: Lightsource bp (Photo: lightsourcebp.com)

Staff Writer | Energy Chamber

Global solar leader Lightsource bp announced it has secured a new \$1.8 billion revolving credit facility and trade finance facility that will help fuel its new global growth strategy of developing 25GW of solar by 2025.

The funding, provided by 10 top tier global financial institutions, underpins Lightsource bp's growth ambitions and execution strategy as it continues to accelerate the deployment of solar across the EMEA, Americas and Asia Pacific regions.

Since its formation in 2010, Lightsource has developed 3.8GW of solar projects globally. It is now aiming to drive this total to 25GW of developed projects by 2025, fed by its expanding development pipeline.

The Lightsource bp pipeline continues to grow rapidly through greenfield, co-development and acquisition opportunities. This growth is expected to create over 500 new jobs within Lightsource bp over the next four years.

In addition to this 20GW-plus pipeline, Lightsource bp is also developing a 9GW portfolio exclusively for bp.

Nick Boyle, Group Chief Executive for Lightsource bp, said, "Globally, renewable energy is shifting from a mindset of gigawatts to terawatts. Investments are being made by the billion, not the million. And big companies like Amazon, McDonald's and eBay are switching to clean energy. This trend proves that renewables are mainstream and solar is playing a key role in addressing the climate crisis. If we're going to meet the commitments of the Paris Agreement—business as usual isn't going to cut it. Our industry-leading 25GW by 2025 target and the finance package are further proof that Lightsource bp has left business as usual

"Big companies like Amazon, McDonald's and eBay are switching to clean energy. This trend proves that renewables are mainstream and solar is playing a key role in addressing the climate crisis."

far behind. Although we need to move quickly, we are committed to scaling up safely, sustainably and responsibly—putting people and the planet at the centre of everything we do. "We know our plans for growth and job creation are very ambitious, but this is the pace of change we need to move at."

Lightsource bp's new 25GW target, and strong projected job creation, bolstered by its robust and growing project pipeline, represent the next stage of growth since Lightsource and bp joined forces, fast-tracking the venture's global expansion, in December 2017.

Dev Sanyal, bp's Executive Vice President of Gas and Low Carbon, added, "In the four years since we formed Lightsource bp, it has tripled its footprint and doubled its workforce. The speed and breadth of that expansion is testament to the power of this partnership and what an integrated energy company with global reach brings to the table. Couple that with the drive and

delivery of Lightsource and that's where the magic happens. Lightsource bp has developed more than 30 projects, which today have consistently delivered 8 to 10% returns. So when people ask if we really have the capability to deliver the returns we talk about, the answer couldn't be clearer—yes, we can because we are. Lightsource bp continues to deliver and it continues to grow. And quite frankly we love it—because it works."

In 2021, Lightsource bp already significantly increased its presence across many major European markets, including Spain, Italy and Portugal and announced a major auction win and market entry into Greece. In the US, the company is quickly growing into one of the largest solar developers, with a US portfolio of almost 10GW including more than 1.9GW entering into operations or construction in the last 18 months alone. Additionally, Lightsource bp is exclusively developing a 9GW solar pipeline for bp, following its acquisition from 7X Energy. Since 2017, Lightsource bp has grown its global footprint from five to 15 countries and doubled its workforce from 300 to 600 people, with around 200 jobs being created and filled during the pandemic.

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China has a clear pathway to build a more sustainable, secure and inclusive energy future



Powering Chinese cities will be a major challenge for the future

Staff Writer | Energy Chamber

China's remarkable economic growth over the past four decades has lifted hundreds of millions of people out of poverty, turning the country into a leader in many industries but also the world's largest carbon emitter, accounting for one-third of global carbon dioxide (CO₂) emissions. China provides more than half of the world's steel and cement, but the CO₂ emissions from just those two sectors in China are higher than the European Union's total CO₂ emissions.

China is aiming to reach a peak in its CO₂ emissions before 2030 and carbon neutrality before 2060. The energy sector is the source of almost 90% of China's greenhouse gas emissions, putting energy policies at the heart of the country's transition to carbon neutrality. A new IEA report—*An Energy Sector Roadmap to Carbon Neutrality in China*—explores how China can reach its objectives while ensuring energy security and affordability for its citizens. It shows that the required investments are well within China's capacities, given the size and dynamism of its economy. The report responds to the Chinese government's invitation to the IEA to cooperate on long-term strategies.

"China is a clean energy powerhouse and has played a leading role in many of the world's success stories to date, from solar power to electric vehicles," said Dr. Fatih Birol, the IEA Executive Director. "China's efforts to achieve its ambition of carbon neutrality will result in even greater flourishing across a wider array of low-carbon technologies and a significant decline in fossil fuel use in the coming decades."

"However, the really uplifting news is that our new Roadmap shows China has the means and capabilities to accomplish an even faster clean energy transition that would result in greater social and economic benefits for the Chinese people and also increase the world's chances of limiting the rise in global temperatures

to 1.5°C," Dr. Birol added. "This accelerated transition would put China's CO₂ emissions into marked decline after 2025, opening up the possibility of China reaching carbon neutrality well before 2060. This would be both good for China and good for the world."

China has made notable progress in its clean energy transition, but it still faces some significant challenges. Coal accounts for over 60% of electricity generation, and China continues to build new coal power plants domestically. At the same time, China has added more solar power capacity than any other country year after year. It is the second largest oil consumer in the world, but it also home to 70% of global manufacturing capacity for electric vehicle batteries.

At the same time, reaching China's climate targets cannot rely solely on the rollout of renewables and electric vehicles. It will need to involve solutions to tackle emissions from its huge existing fleet of fossil fuel-based power plants, steel mills, cement kilns and other industrial facilities. If the existing emissions-intensive energy infrastructure in China continues to operate in the same way as it does today, its CO₂ output between now and 2060 would amount to one-third of the global carbon budget for limiting the global temperature rise to 1.5°C. This is aside from any new plants that may be built to meet growing demand.

The China Roadmap sets out a pathway consistent with the enhanced ambitions that China announced last year in which CO₂ emissions reach a peak before 2030 and carbon neutrality is achieved before 2060. The main drivers of emissions reductions between now and 2030 in this pathway are energy efficiency improvements, expansion of renewables and a reduction in coal use. Electricity generation from renewables, mainly wind and solar PV, increases seven-fold between 2020 and 2060, accounting for almost 80% of China's power mix by then. Industrial CO₂

emissions decline by nearly 95% by 2060, with the role of emerging innovative technologies, such as hydrogen and carbon capture, growing strongly after 2030. These changes will boost China's labour market, with more new jobs created in growing low-carbon energy technologies than are lost in declining fossil fuel industries.

The Roadmap also explores the opportunities for China to pursue—and benefit from—an even faster clean energy transition, which would result in China's CO₂ emissions declining to almost 20% below their current level by 2030. On top of the major advantages that come from reducing the impact of climate change, the social and economic benefits include greater prosperity for regions that have not yet fully benefited from China's economic development and a bigger net gain in job creation nationwide. And investment needs are not a barrier for the faster transition, since the cumulative investments are similar to those in the slower one.

"This Roadmap shows what is possible: China has a clear pathway to build a more sustainable, secure and inclusive energy future," Dr. Birol said. "As China makes some important decisions in the coming weeks and months, the IEA is pleased to share our analysis and global expertise with Chinese policy makers so that together we can help build a brighter future. I also welcome President Xi Jinping's announcement last week that China will stop building coal power plants overseas as a further positive step towards curbing global emissions."

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