



**GOVERNMENT OF THE REPUBLIC OF TRINIDAD AND TOBAGO**

**Feature Address**

**by**

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**and**

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**7<sup>th</sup> Geological Conference of the Geological Society of  
Trinidad and Tobago**

**“ Geoscience of the Future: Adapt, Innovate, Evolve ”**

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It is my pleasure to deliver the feature address this morning at the 7th Geological Conference of the Geological Society of Trinidad and Tobago (GSTT).

Prior to the advent of local ownership in the oil and gas industry the majority of the industry's technical support were expatriate. In 1974 when Government acquired the interests of Shell Trinidad and formed Trintoc, it became apparent that Trintoc could not depend on accessing resources from the foreign companies but would have to develop its own inhouse capability. The major human resource deficiency was in geology. The company had petroleum engineers, drillers and the like but no geologists. This led to the active recruiting abroad of geologists with linkages to Trinidad and Tobago.

The need for the deepening of local technical capability was reinforced by the second petroleum revolution based on natural gas. Discoveries in the early 1970s off the East Coast fields precipitated the country's industrial development based on natural gas. The availability of abundant natural gas led to the development of the Point Lisas Industrial Estate at Couva and the LNG facility comprising four Trains at Point Fortin. These developments established Trinidad and Tobago as a major global producer of petrochemicals, ammonia and methanol and liquefied natural gas. Their success required new discoveries to provide the feedstock for these and other gas-based industries. This has been achieved by successive series of bid-rounds offering blocks onshore and offshore for exploration.

Trinidad and Tobago despite having less than one percent of the known global gas reserves is renowned as a leading gas based export centre . Our success has been due to the astute management of our world class hydrocarbon province, the participation of major global oil and gas companies, an experienced and proven energy service

sector and the contributions of professional geological and petroleum engineering societies such as yourselves.

The Global Petroleum Survey, a global benchmarking survey to assess how attractive various jurisdictions are for oil and gas investment, has consistently ranked Trinidad and Tobago in the 2nd quintile. Trinidad and Tobago strong showing has been a function of number of criteria which include the quality of the country's geological database and the availability of a cadre of qualified and experienced energy professionals.

The GSTT, in particular, by its outreach and focused activities has been instrumental in the development of young energy professionals and in the continuing update of the technical knowledge of its members, with the primary but not exclusive focus, being the needs of the petroleum industry. Through your intervention you have been instrumental in the establishment by the University of the West Indies of a degree in Petroleum Geoscience and in Petroleum Engineering at its St Augustine Campus. You are to be commended for the sterling work you have undertaken and continue to perform in advancing the technical developments of energy professionals in the domestic energy sector and I there say globally.

However GSTT contribution has not been one dimensional as in your short history you have made significant contributions to the development of science, industry, academics and the wider society. Although the most profound contribution has been in the development of the country's oil and gas resources, your influence has extended to other areas such as mining, water resources, the environment and alternative energy. This is reflected in your membership, with oil and gas companies and energy services accounting for 36% of your membership followed by academia with 18% , national oil and gas companies with 10% and Government Ministries with 6%. Several Members of the GSTT have gone on to hold executive positions

in Government and in the private sector, a testimony to the claim that GSTT is a training ground for leadership roles not only in the petroleum industry but in the wider community.

Your contribution as geoscientists is invaluable as geosciences underpin our understanding of the many intersections between petroleum and the environment. Without the work of geoscientists, we would have neither the energy system nor the environmental protections we benefit from today.

The theme of the Conference -Geoscience of the Future: Adapt, Innovate and Evolve is very relevant. The energy environment that exists today is very much different than what obtained when GSTT was a fledgling organization and whose main focus was the development of its members' technical expertise to service a growing oil and gas industry.

We are currently in the midst of a global energy transition which has brought about much uncertainty as to the future of hydrocarbon development. As the global energy transition picks up pace, oil and gas companies have begun pivoting toward renewables and diversifying portfolios to reposition themselves as energy companies rather than just oil and gas companies. In this evolving scenario, the skillsets required beyond the core geoscience competences include transition management and analytical skills to support project management and rapid problem solving, and IT and systems integration skills to manage system changes, data migration, and infrastructure transition.

The global movement in the transition to low carbon energy systems has had far reaching implications, particularly in relation to petroleum related studies. As a consequence of the volatility in the petroleum industry, layoffs and a growing social campaign against fossil fuels in some quarters, there has been a steep decline in

enrollment universally in petroleum related studies. Change is taking place, how do you evolve?

Trinidad and Tobago has had a mixed experience. The student numbers in UWI's BSc Geoscience and MSc Petroleum Engineering Programmes decreased by about 50 % but there was an increase in the numbers in its MSc Reservoir Engineering programme. I have been informed that all of UWI's MSc graduates from its Petroleum Studies Unit gained employment, which confirms that the course of study is very much relevant.

In keeping with the industry trend to renewable energy, the diversification of portfolios, and application of data analytics and artificial intelligence as decision making tools, the Petroleum Studies Unit of the University of the West Indies, St Augustine is being reorganized to make its programmes more relevant and marketable.

In this regard, courses in Petroleum and Reservoir Engineering are being modified by the University to include content in the Management of Carbon Emissions, Data Analytics which include Machine Learning and Artificial Intelligence applications and aspects of Renewable Energy such as geoscience applications for Carbon Capture, Utilization and Storage (CCUS) and Geothermal Systems.

Given the reorganization of its programmes to meet industry requirements, the University is hoping for an improved enrollment in the new semester commencing September 2022.

Despite the trend to renewables, there is agreement among most energy publications that oil and gas will continue to be important primary fuels for the coming decades. I believe this and I am an advocate for the continued and increased use of natural gas, as it is the cleanest fossil fuel. In 2020, fossil fuels represented approximately

79 percent of primary energy consumption worldwide and by 2050, they are projected to represent approximately 65 percent of primary energy under the GECF assumptions, but in a much larger market. The share of petroleum and other liquids in the primary energy mix is projected to decrease from 30% in 2020 to 25% by 2050. Natural gas demand is projected to increase by 46% and its share in the energy mix from 23% in 2020 to 27% by 2050. The Asia Pacific region, almost doubling its current gas consumption, will make the largest contribution to this growth with more than 45% of the additional global gas volumes through to 2050. The power generation sector will also take a frontline place, accounting for 42% of the total increase in gas demand.

As a small island state and a hydrocarbon economy we recognize our responsibility to transition to a low carbon economy and, thankfully, decades ago we identified natural gas as the fuel of choice in achieving this objective. In this regard Government is aligned with the policies of its major gas producers who consider natural gas production as the transition fuel in the movement to net zero carbon emissions. We have been, and intend to continue, working closely with our stakeholders whether in the upstream, midstream and downstream sectors toward the achievement of a low carbon economy. We are determined to keep Trinidad and Tobago competitive in the changing and evolving global energy sector.

For the foreseeable future Trinidad and Tobago's economy will be dominated by oil and gas. We are fortunate to have as partners energy majors BP, Shell, Woodside (formerly BHP), Repsol, EOG Resources, and the smaller outfits, like Perenco and Touchstone who have committed to tangible and sustained investment in the upstream. We also have new comer, De Novo who has proved itself as a stranded, and smaller field producer. As a Government we will facilitate upstream investment

with the appropriate policies to ensure that we maximize the recovery and monetization of the country's hydrocarbon resources, which are substantial.

The latest gas reserve audit established that at year end 2020 technically recoverable resources amounted to 23.2 trillion cubic feet (tcf) and prospective of 55.2 tcf . Whereas in the latest oil audit , 3P reserves amounted to 455.3 million barrels and prospective resources amounted to 3.2 billion barrels with 90% being in our deep-water province. Your membership has an essential role to play in our continued development. You have an important and essential role to play in the continued development of Trinidad and Tobago.

Natural gas plays a critical role in supporting our petrochemical and Liquefied Natural Gas (LNG) industries. Trinidad and Tobago has ten (10) Ammonia Plants, seven (7) Methanol Plants and four (4) LNG Trains, all of which depend on natural gas as the primary feedstock. Currently the National Gas Company is in negotiations with upstream companies for new gas supply contracts in order to maintain its supply to its downstream customers. Government is also actively engaged in negotiations with Atlantic Shareholders on a long term agreement and liquefaction licence for the operation of a restructured unified Atlantic LNG Facility. We have spent considerable time, energy and effort on the sector and in particular on negotiations for the past six and a half years.

Natural gas production which was on the upswing up to 2019 was negatively impacted by the covid pandemic in 2020. While upstream operations continued relatively unaffected, projects to bring on new and replacement production were delayed. The pandemic also severely curtailed global demand in a number of industries and particularly for energy related products. Petrochemicals were hard hit. The prices of ammonia and methanol which are major exports of Trinidad and Tobago fell to low levels in 2020 and 2021.

This led to the operations of a number of petrochemical plants being temporarily curtailed. The combination of project delays and the fall in demand led to a reduction in natural gas production.

At the time, the naysayers, including, unfortunately, some of whom were being paid by those with self serving agendas which were not in the best interest of the citizens of Trinidad and Tobago, were painting a negative narrative of collapse and disaster at Pt. Lisas. However, the Government and NGC held firm to positions to protect the citizens and extract fair and equitable returns for the population. Fortunately as difficult as it was at the time, we stood on principle and steadfast in our negotiations and today, the citizens are reaping the monetary benefits of these positions we took with increased revenue to the NGC and the Treasury.

The global energy market has since rebounded. The crude oil price of our marker crude WTI which averaged US\$37 per barrel in 2020 is currently revolving around US\$100 per barrel. Henry Hub, which is the main marker price for the majority of the current LNG gas contracts, averaged US\$2.03 per mmbtu in 2020. It increased to US\$8.95 per mmbtu in June 2022 and is currently around US\$6.00 per mmbtu. Ammonia and methanol prices which fell to below US\$200 per metric ton in 2020 have also exhibited a resurgence. Ammonia in April 2022 reached US\$1500 per metric ton and is currently trading around US\$960 per metric ton. Methanol in March 2022 reached US\$450 per ton and is currently trading at approximately US\$341 per ton. These commodity prices are cyclical and we must be prepared for the highs and lows.

In order to benefit from the improved energy prices, gas and oil output needs to be accelerated. Natural gas production received a major boost with the start-up of BPTT's Matapal, Shell's Barracuda and BHP Ruby-Delaware in 2021. The momentum continues into 2022 with BPTT's Cassia C Development and Shell's



Colibri Project bot of which we negotiated in 2018/ 2019. Over the next five years there are projects with gas reserves of 3.0 tcf which are earmarked for sanctioning. Beyond this period, mega projects such as Shell's Manatee project with gas reserves of 2.7 tcf and Woodside's (formerly BHP's) deep-water Calypso project with gas resources of 6.6 tcf are due to come onstream. We are actively engaged with the upstream companies to facilitate the timely sanctioning of the projects.

Trinidad and Tobago's gas industry is at the point where we need to convert prospective gas resources of 55.2 bcf to reserves. To this end Government is pursuing an ambitious bid-round programme which commenced with the deep-water bid-round which was closed on June 2, 2022 . Bids were received for four blocks 23(b) , 25 (a) , 25 (b) and 27 from a Consortium of BP Exploration Operating Company and BG International Limited, a subsidiary of the Shell Group of companies.

The four blocks which received bids are located in the Eastern Deepwater transition area in water depths ranging from 1000 metres to 2000 metres. Reservoir presence has been widely proven, with a range of high quality slope to basin floor fan deposits near the Columbus Basin and deep-water channelized lobes in the deep water area, which form complex structural and stratigraphic traps. All of the blocks have been subject to previous exploration activity which indicated the presence of hydrocarbons. It is our expectation that the application of new technologies will realize the potential of these blocks.

Given the global competition for capital within companies, the bids are indicative of the upstream companies continuing commitment to investment in Trinidad and Tobago. The bids are currently being evaluated and an announcement of the results will be made within three months, on or before September 2, 2022. The deep-water bid-round is being followed by the onshore bid-round and the shallow-water bid-

round. The legal instruments establishing the onshore bid round were effected on Friday 8th July 2022. So the onshore bid round is open and we are looking forward to much interest in our onshore blocks. Kimberlee London, Senior Geologist and one of the bid-round coordinators will provide details of the onshore bid-round this morning. The shallow-water bid round, which will follow, is currently being finalized. It is the intention to launch this bid-round before year end 2022.

Ladies and gentlemen, the volatility in oil, gas and petrochemical prices, whether through geopolitics or otherwise, underscores the realization that Trinidad and Tobago has limited or no influence on these prices and operates as a price taker. We also find ourselves in a unique position in having to manage the opposing requirements of the upstream and downstream sectors, including LNG. In between the upstream and downstream, there is the National Gas Company (NGC), whose role as a midstream aggregator and transporter of gas is becoming increasingly challenging in the light of diminishing margins. However, NGC is the entity that seeks to extract financial value for us, the citizens, and it is Government's policy that NGC will continue to protect our interests.

While natural gas has occupied center stage, crude oil has seen a resurgence with discoveries by Touchstone and BHP and is expected to constitute a significant role in the country's primary energy mix. At this juncture, the potential for future oil production, lies with State owned Heritage Petroleum Company Limited, which is the country's largest oil producer and the largest holder of onshore acreage. The company has exploration and production rights onshore, primarily located in the Southern Basin, and in its offshore acreage in the West Coast Marine Area.

With respect to its onshore acreage, Heritage has been focusing on securing a joint-venture partner for its North West District which is located within the western segment of the Southern Basin geologic province. The North West District is

covered by 3D seismic survey covering approximately 287 sq. km, which is currently being reprocessed. In the interim, the process for engaging a joint-venture partner has been deferred pending the completion of the reprocessing exercise.

As regards its offshore acreage, Heritage signed a farmout agreement and joint operating agreement with EOG Resources Limited for exploration and development of its East Field in its Trinidad Northern Area. The farm-in area comprises of 14,870 hectares over the wider Trinidad Northern Area E&P Licence area comprising approximately 97,000 hectares. EOG has 65% interest in the venture and is the operator. The first exploration well was spud on June 10, 2022 and drilling is projected to be completed in 30 days. We are looking forward to good results and increased oil production from this venture.

Heritage also invited proposals for the joint development of its Jubilee field in the Soldado Block off Trinidad West Coast Marine Area. Following an extensive and globally focused EOI and RFP process, Heritage has entered in negotiations with the preferred bidder on a joint venture arrangement to develop the Jubilee area, including the redevelopment of the existing brownfield acreage. This initiative has the potential to introduce a new oil and gas company into the Trinidad and Tobago energy landscape.

I have also mandated Heritage and the Ministry of Energy and Energy Industries to work with lease out, farm out and work over companies to increase our oil productions and I am prepared to take hard and difficult decisions, including, relinquishment of acreage from block holders who are not producing and fulfilling obligations.

As we continue to develop and monetize our hydrocarbon resources, we cannot ignore the structural changes that are taking place in the global energy market. There is a universal commitment for the decarbonization of fossil fuels as a strategy to reduce global warming. There has been a shift primarily from oil and coal to natural gas and renewables in energy usage. Natural gas which is cleanest of the fossil fuels is projected to increase its share of the primary energy mix. As global demand for energy rises, natural gas is emerging as a fuel of choice serving as a central ingredient in a more sustainable energy mix in combination with renewable energy sources such as solar and wind.

The rising importance of natural gas can be gauged by the global LNG demand , which is projected by the GECF to increase from 356 million tonnes in 2020 to 800 million tonnes by 2050, driven by demand from Asia and a rise in gas in power generation. To meet the growing demand for LNG will require a significant increase in global LNG infrastructure, in particular regasification capacity. The GECF has predicted that regasification capacity will grow from 947 million tonnes per annum to 1465 million tonnes per annum by 2050 and liquefaction capacity from 462 million tonnes per annum to 1240 million tonnes per annum by 2050. The investments in LNG infrastructure are expected to fuel greater LNG demand in the coming years, with demand driven by markets in Asia Pacific. This augurs well for the Trinidad and Tobago LNG Business which is current being restructured and which on completion will be positioned to enjoy enhanced financial returns from the marketing of LNG in a growing market.

Natural gas in many quarters is perceived as a transition fuel but it is my submission globally that it is the energy source that will continue along with renewables well into the future way beyond of 2050.

As a Government we have adopted a measured approach. We are committed to the maintenance of our pledge at 2015 Paris Climate Change Conference to reduce our CO2 emissions and to alter our energy mix to include renewables. As a country we managed successfully the change from oil to gas as our primary fuel . We are confident that we will not only adapt, and embrace this new paradigm but we will continue to be a global leader in how it should be done.

We have a target of 30% of power generation from renewables with the first phase of this initiative to come onstream by year end 2023. High on our agenda is also the reduction of carbon emissions. There is currently a Committee chaired by the Permanent Secretary of Energy and Energy Industries to manage the implementation of a Large-Scale CO2 EOR Project and to address the reduction of carbon dioxide emissions, carbon capture and carbon sequestration. The initial focus of the Committee is the identification of suitable reservoirs in the Heritage producing areas where Heritage would have the lead and be responsible for the implementation of the project. Evaluations are ongoing with a current focus on Forest Reserve area/fields.

As an oil and gas producer, we recognize that one of the principal emissions is methane, whether by flaring, venting or leaks. The reduction of flaring and venting of methane is not only environmentally beneficial but also bolsters energy security by eliminating the waste of gas resources. To this end Trinidad and Tobago has joined with more than 100 countries as a signatory to the Global Methane Pledge Pathway aimed at reducing anthropogenic methane emissions by at least 30 percent by 2030 from 2020 levels. Both the Honourable Prime Minister and myself have met with Former Secretary of State John Kerry, President Biden's special energy and climate envoy on these efforts.

In the same vein, that Trinidad and Tobago is seeking to position itself in the energy transition, professional organizations such as GSTT will need to redefine their roles to support the development of low carbon infrastructure. Oil and gas exploration strategies are shifting from quantity to quality, with companies aiming to locate resources with the lowest carbon footprint and selectively develop only the best. Therefore Geoscientists working in the energy resource industries, especially oil and gas, face a challenge to be as responsible as possible in the optimum extraction of these resources. Geoscientists, who are fully committed to overcoming these challenges will see, in turn, a diversification of career opportunities as society and industry evolves. You must evolve. You must lead. You must work to ensure Trinidad and Tobago's continued development.

In addition to their domain expertise, geoscientist must be acquainted with digital data revolution. The combination of ever-increasing computing power and data science is providing new scientific insights, thereby transforming all resource industries, contributing to improved efficiency and associated environmental benefits, such as reduced emissions and a reduced carbon footprint.

In the new low-carbon infrastructure developed around solar, wind, hydro, tidal, and geothermal energy resources, geoscience will play a key role particularly in the development of wind energy and geothermal energy by resolving fundamental geological and environmental challenges.

The geoscientists that will thrive are those who are able to adapt to the technological environment and the diversity in energy sources. Technological dexterity will bring additional value to the field, and the combination of deep fundamental geoscience knowledge and digital fluency is likely to be the foundation for the next era of geoscience innovation, discovery and application.

However, the challenges of energy transition are not limited to any single body but requires a collaborative approach. A transdisciplinary approach encompassing participatory collaboration, inclusivity, and communication among stakeholders is required to address the challenges in energy transition. Accordingly, collaboration among geoscientists, petroleum engineers, geologists, engineers, social scientists, policy makers and financiers to meet the challenges of the energy transition, is an important and necessary step. Put simply, collaboration is the key to achieve a just energy transition and in particular one that benefits Trinidad and Tobago.

As Government, we have charted a way forward that seeks to sustain the domestic sector as we progress to a low carbon economy. The geosciences and other like professional technical societies will play a fundamental role in enabling the energy transition. We are confident that we are on the right path and look forward to your continuing contribution. We look forward to your leadership and innovation.

The road ahead may be challenging but it is also replete with opportunity. I am confident that GSTT will embrace the challenges and respond proactively to the energy transition , and emerge as a stronger force in the evolving energy industry. In closing , I thank you for the opportunity to provide my perspective on the future of geosciences in the global energy transition. Please accept my best wishes for a productive and successful conference and I now launch the 2022 Onshore Bid-round.

I thank you for your attention.