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Zoning in on the T&T Energy Conference:

Collaboration for change and country- p4

WHAT'S INSIDE

Downstream Project Development - p7

CONTENTS

PRESIDENT'S MESSAGE
Global Outlook – Local Focus | 03

BUSINESS DEVELOPMENT
Collaboration for Change and Country: Energy Conference Recap | 04
Downstream Project Development | 07
Commodity Trading – A New Line of Business for The NGC Group | 10

ENVIRONMENT & SAFETY
The Recycling Drive of the NGC Eco-Phoenix Club | 14

NGC NEWS
Introducing the New VP of GTD Project Updates - LFPP and PPVS | 16
NGC-sponsored Steelbands Update | 19
CAER Update | 20

NATIONAL ENERGY NEWS
Update on Extension of National Energy's Head Office | 21

LABIDCO NEWS
Update on the Repairs to Berth 2 | 22

NGC CNG NEWS
CNG Rebate for Employees | 23
CNG Fuel Station Network Set to Expand 320 'HT' Vehicles to Use CNG Gas in Coming Months | 24

PPGPL NEWS
PPGPL's Propane Recovery Improvement Project | 25

INDUSTRY NEWS
Juniper Platform Achieves Major Milestone | 26

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THE NATIONAL GAS COMPANY OF TRINIDAD AND TOBAGO LIMITED

PRESIDENT'S MESSAGE

Global Outlook – Local Focus

The year 2016 has been acknowledged as a year that will be an extremely challenging time for the natural gas and related energy industries and for Trinidad and Tobago with the decline in global commodity prices. With the first quarter having passed, NGC is still looking forward, with optimism, to the sustainability and growth of the local gas-based energy sector.

Leaders of the local and regional energy sectors assembled at the Energy Chamber's annual Trinidad and Tobago Energy Conference in January 2016 to share insights regarding the issues affecting the sector and its future. *Gasco News* must offer congratulations to the Chamber for yet another successful Energy Conference and for its achievement of its milestone 60th Anniversary year. During the conference, burning issues in the local and global energy sectors were discussed, including energy development in Trinidad and Tobago and a sustainable supply chain, LNG, ammonia and methanol markets respectively.

The challenges presented by low commodity prices and stagnant natural gas production, have prompted internal reckoning. Improved productivity will help through this difficult economic period, as well as cost reduction and control. In addition, there has been a call moving forward for greater integration of the NGC Group of Companies, thereby supporting the NGC Group strategy of building on each member's reputation, capabilities and legacies as we focus on the operations of our local business.

Consistent with the vision of the Chairman of the NGC Group, Mr. Gerry C. Brooks, the Company must maintain a global outlook with a local focus. He reiterated that "NGC is not a local company. The NGC Group operates locally, but is very much part of an international business". With that broader vision, the NGC Group would be seeking growth opportunities outside of Trinidad and Tobago to leverage its expertise and experiences from the Trinidad and Tobago Natural Gas Model of Development. Much remains to be done: evaluating risk and assessing profitability, but the Group's early groundwork, has revealed a market with significant potential.

The change in mindset that prompts a relatively small, state-owned gas company with four decades' experience, to scan the horizon for prospects is no small undertaking; but the delegation representing the Group is energised by the possibilities and fully aware that international growth entails risk. The NGC Group moves forward on its assessment of its business opportunities, always mindful to determine firstly, if the potential benefits are worth the risk.

Olave Maria Thorne, President (Ag.), NGC

The Group is also now recommitted to tougher negotiations to ensure optimum value is derived through its management of the nation's natural resource. Notwithstanding expected increases in the natural gas supply from the Juniper, Sercan and TROC projects, NGC needs to engage its producers on extracting natural gas from small and marginal fields. In addition, NGC needs to pursue gas supply opportunities from its neighbours in the medium to longer-term perspective. The future development of the cross-border Loran-Manatee field with natural gas supplies to Trinidad will be a game changer.

Another potential area of new business locally is the commodity-trading initiative with energy partners. This initiative seeks to promote the marketing of products by the NGC Group to provide an additional revenue stream to the Group.

My final message is to reiterate the watchwords for 2016 – global outlook but with a local focus. We must strive to reduce and control costs, improve productivity and be more vigilant in all of our negotiations as we seek to extract greater value from the management of the country's natural gas resource.

Olave Maria Thorne, President (Ag.), NGC

BUSINESS DEVELOPMENT

Collaboration for Change and Country: Energy Conference Recap

(L-R) Mr. Norman Christie, Regional President of BP Trinidad and Tobago; Mr. Gerry C. Brooks, Chairman, NGC; Dr. Thackwray 'Dax' Driver, President and CEO, The Energy Chamber of Trinidad and Tobago and Mr. Vincent Pereira, Chairman, The Energy Chamber of Trinidad and Tobago/Country Manager, BHP Billiton Trinidad and Tobago

The Energy Chamber of Trinidad and Tobago hosted its annual Trinidad and Tobago Energy Conference and Tradeshow from 18th to 20th January, 2016 at the Hyatt Regency, Port-of-Spain. Approximately 1,400 visitors were in attendance over the three-day event and included delegates from the US, UK, Barbados, Guyana, Suriname, Venezuela, China, Falkland Islands and Dominican Republic. NGC was a platinum sponsor at this year's conference, which has been touted by the Chamber as being "the premier Energy Conference" promoting vigorous debate and discussion among leaders of industry, Government and academia.

On day two of the conference, Mr. Gerry C. Brooks, Chairman of the NGC Group of Companies participated in the closing panel discussion along with Mr. Vincent Pereira, Chairman of the Energy Chamber of Trinidad and Tobago and Country Manager of BHP Billiton Trinidad and Tobago; Mr. Norman Christie, Regional President of BP Trinidad and Tobago; and moderated by Dr. Thackwray 'Dax' Driver, President and CEO of The Energy Chamber of Trinidad and Tobago. The panellists shared an interest in working towards a future that factored in sustainable patterns in a variety of energy sector-specific, as well as general issues. Mr. Brooks, in particular, contributed a number of optimistic solutions for the way forward.

Focusing on the NGC Group, Mr. Brooks described the organisation's determination and transition to be "a lean, mean, agile organisation, competitively positioned, fully integrated, and ready to go international." While the prices of oil and gas are expected to be lower for longer than initially envisaged, the natural gas sector can find survival and efficiency in the strengthening of collaborative work. It is a message which resonates throughout the NGC Group of Companies and which is also filtering out to the rest of the country.

The theme of streamlining and adjustment has been critically shared at all levels and, perhaps not surprisingly, the most adaptable ideas prove the most robust at both the sector and national levels. The NGC Group comprises several companies — with the opportunity and potential to create what the Chairman and Board describe as 'a Shared Services Model' that could provide a platform for common services such as Human Resources, IT, Procurement, Accounting, Financial Reporting and Health and Safety. NGC's Chairman proposed that the structure may be well extended to other state companies such as Petrotrin and National Petroleum through further partnering and sharing.

The reduction of task (or department) replication creates significant organisational savings, as much as it demands increased efficiency and smart spending. It would also allow the companies to be more dedicated to the material aspects of their business.

The time and effort invested in ancillary infrastructure is not to be disregarded; rather, by making the desired adjustments, their performance will add to the overall maintenance of an increasingly productive machine.

By clearly articulated references to other enterprises, partners, countries and regions, the NGC Group Chairman described a future in which these models of integration and mutual-capability building were the norm. He suggested the need for NGC to expand beyond Trinidad and Tobago was imperative. To remain tied to the country is to leave both the company and country exposed to market unpredictability. He also cited the need "to improve earning potential while reducing our earnings volatility." Still in the language of shared future, Mr. Brooks spoke of partnering with other state enterprises and service companies to maximise the capacity and expertise of systems related to ports, technical skills, estate development, infrastructure and pipeline capability. This is development at a national level. This is about the responsibility to make the region more competitive for stability and growth.

GETTING SPECIFIC

Opening up the country to expansion within the energy sector involves ongoing efforts in familiar work but not necessarily using the existing framework. Mr. Brooks referred to opportunities extant in the exercises of dredging and deepening of Port Galeota: "Port Galeota is a natural link into Guyana and also into South-South trade. That's a real opportunity that goes beyond the energy sector," he said.

With a barely discernible difference in the vision for the Group, the industry and the country, the idea of company delegations seeking their independent interests seem ineffective. Instead, delegations need to represent country, energy, service, manufacturing, technology and finance. With the idea of greater pursuit of deepwater dredging, comes the question of how to protect assets and people – again, this is a conversation that must be engaged at the state level.

Moving on to the issue of gas production, there was consensus that continued high levels of investment is needed. The Panel Chair, Dr. Driver, acknowledged that decisions affecting activities already in train had been made in a time of greater economic stability. How is such investment to be maintained in the current climate? bpTT's Mr. Christie offered this straightforward response:

"A fair amount of it certainly helps. The truth is we invest through cycles; now we are talking about a down cycle, but upstream you are talking about decades, not one year or two years. If you're thinking

Mr. Narinejit Pariag, VP (Ag.), Finance and Information Management, NGC; Mr. Dominic Rampersad, President (Ag.), PPGPL and Mr. Marcus Ganness, Director, NGC attend Day 2 of the Trinidad and Tobago Energy Conference

through cycles, where certainty can be created we'd prefer to have the certainty, because you can take the pain now recognising what you'll gain later. What could bring some certainty to a gas player in the upstream, especially one that's about to have major contracts renegotiated are some clear policies around gas utilisation."

MANAGING GAS SUPPLY IN THE PRESENT CLIMATE

This turn in the conversation ushered in the relevance of the Natural Gas Master Plan. Mr. Brooks considered the short, medium and long-term needs of industry partners within the context of the Plan. While the current gas shortages are expected to continue for some time, it is a situation that can be managed with clear communication amongst players and consultation with relevant parties. Upstream and downstream companies must work towards coordinated activities, for instance, in shutdowns or maintenance, for supply to consistently meet demand. Mr. Brooks is of the view that a sustained effort in this exercise would help to minimise the percentile of curtailment. The short term also involves bringing more gas into the system through a commitment to the compression project, as well as delivering the Juniper Offshore Gas Project.

Small and marginal fields are increasingly important in the medium term. Mr. Brooks pointed out that they would be best managed by "agile, independent operators who are cost effective." Here he sees numerous opportunities for collaboration and capacity building. As with all time-frame scenarios under consideration, the greatest efficiencies are likely to be the result of a well-honed system of coordination and communication so that all parties are invested in

Trinidad and Tobago Energy Conference attendees visit the tradeshow

the best outcomes for their partners. He also stressed the important opportunity presented by cross-border gas.

GAME CHANGING ARCHITECTURE

That collaboration is the most sensible response to changes within individual entities, throughout the industry and state, could not have been more fully agreed upon. Each of the speakers articulated different examples, but, sure enough, collaboration was the consensus. Apart from its inherent virtue of inclusivity, it is a functional solution – it is arguably the most efficient way to be aware and remain sensitive to any changes great and small, thus allowing for appropriate adaptations to any shifts within the energy landscape.

In the latter part of the discussion, there was considerable attention on identifying challenges and seeking new and better ways to respond to them. "How do you reallocate resources from a transfer and subsidy mode and inspire entrepreneurship and productivity?" Mr. Brooks asked. This is a big question at every level and with every nuance to which it is open. One of the issues, alluded to earlier in the dialogue in considering the role of universities, was the investment in research: a national research and development strategy is what Dr. Driver thinks is necessary.

Cross-section of delegates during the panel session

No examination of matters pertaining to the energy sector would be complete without renewing or updating an understanding of where we stand with hydrocarbon emissions at every stage of the industry. At present, because our energy rates are so low, there is little incentive to change our behaviour. Cue back to the gradual disengagement from a subsidy model: this is a key change needed to bring about the impetus in the general public to rethink day-to-day behaviour—such as switching off lights. Just now, the cost of adhering to the old ways is negligible. Until a perception-changing cost is associated with what needs to be done to curb emissions and take real steps to address climate change matters, we will continue to do nothing.

As a Small Island Developing State, our tardiness in addressing questions of climate change did not go unnoticed. Mr. Brooks' contribution on the vulnerability of small island states took things out of the abstract and underscored the reality of our vulnerabilities: Trinidad and Tobago is in a hurricane-prone zone; a tsunami born out of activity by Grenada's Kick 'em Jenny can have devastating effects; in islands such as ours, the impact of this type of disaster on GDP is between 10% and 15%, which can set us back a decade. All that we do or have failed to do can be attributed to the will, or lack thereof, to achieve progress in this area.

Nonetheless, the panel closed on a reassuringly positive note. A hope that with all our resources and capability, we will make the necessary adjustments to survive in a world that must eventually transition away from less desirable forms of energy—oil and gas—to renewable substitutes.

Downstream Project Development

The National Energy Head Office on Cor. Rivulet and Factory Roads, Brechin Castle, Couva

By MERLYN-RENNIE BROWNE, VP (Ag.), Energy Industry Development, National Energy and MR. CARLTON THOMAS, Business Analyst, Energy Industry Development, National Energy

RESPONDING TO CHANGING LOCAL AND INTERNATIONAL DYNAMICS

Most people who look at the oil and gas industry right now are likely to characterise the market as 'challenged'. From low oil and gas prices globally, record supplies from the US and Saudis; waning demand from emerging markets; falling investments and reductions in profit margins, the oil and gas industry worldwide is in the midst of a turbulent time period.

The effect of the supply side factors such as the US shale-related production surge, the Organisation of Petroleum Export Countries' reluctance to cut supplies and record production from countries like Russia on the industry has been exacerbated by the weak demand phenomenon that exists today in emerging markets and weakened global growth in 2015 of around 2.9 per cent – well below the long-run average according to the Organisation for Economic Co-operation and Development.

Going forward, projections are highly uncertain regarding how long this depressed environment will last. In addition to the low prices, Trinidad and Tobago continues to experience a sustained shortfall in natural gas supplies to downstream customers and our natural gas reserve to production ratio has experienced a steady decline over the last few years.

High costs and a lack of investable options for investors, according to Deloitte Touche Tohmatsu Limited (Deloitte), are mandating new approaches beyond the traditional stage-gate process to project design, development, financing and approval. To address poor project development performance, Deloitte, for example, found that companies today are employing multiple strategies including Integrated Project Delivery (IPD) where all the commercial objectives of all project participants can be aligned; the utilisation of advanced analytics to identify early indicators of potential issues that may affect project development; and leaner project management options that will enable corporations to adjust workflow and resources in real time.

In responding to the changing dynamics both globally and locally, National Energy has started the process

of adjusting its Project Development Approach to be able to respond accordingly to any scenario that materialises. This approach is supported by strategy consultancy firm McKinsey & Company who, in a *McKinsey Quarterly* article, claimed that, "organisations that become more flexible and skillful at making critical decisions when the timing is right have enormous opportunities to capture markets and profits from companies that persist in managing as if the future business environment is reasonably predictable."

As such, the three tabulated scenarios have been developed to assist maintaining a strategically mixed portfolio of projects in order to ensure that, as enabling conditions materialise, we are able to attract additional capital to Trinidad and Tobago's downstream energy sector.

According to McKinsey, no strategy, however brilliant, can be implemented successfully unless the people who have the most important jobs know what they need to do differently, understand how and why they should do it, and have the necessary resources.

Additionally, an enabling culture is needed, whereby an intellectual approach to project development is maintained, and allows for an objective decision-making process, coupled with a strong emotional culture where there is no stigma of "failure" when a project is shifted or terminated.

Table 1

Project Development Strategy – Impact of Changing Global Energy Dynamics: Shale Gas Phenomenon

US shale gas production with a resurgence of US petrochemical industry	Response	Benefits
• Decline in this country's competitiveness with challenges to attract investment • Shrinking US market for energy based exports because of increased US domestic production • Lower international prices for traditional commodities	• Discussion with relevant stakeholders to enhance the country's attractiveness by reviewing overall package offered to investor(s) • Explore other regional markets and extra-regional markets • Focus on attracting projects for the manufacture of specialty chemicals and other types of niche products	• Enhance our attractiveness as a location for FDI in the downstream energy sub-sector • Reduced dependence on US export market • Production of specialty/ niche petrochemical products creates opportunities to export higher-valued products

Table 2

Project Development Strategy – Impact of Changing Local Energy Dynamics: Low and Declining Gas Availability

Scenario 1 Declining reserve position	Response	Benefits
• Despite enhanced fiscal incentives and increased exploration, activity ... no significant natural gas finds are realised • RTP ratio continues to decline rapidly	• Priority given to projects which utilise little or no natural gas resources • Renewable energy industry focus heightened • Enhanced marketing of energy services internationally • Support the development of new innovative technologies	• Industrial development shift towards a more sustainable resource base

Table 3

Project Development Strategy – Impact of Changing Local Energy Dynamics: Steady Gas Availability

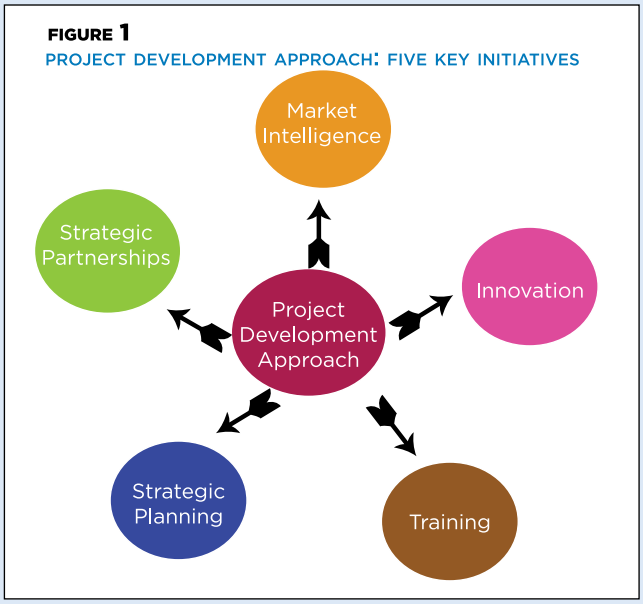
Scenario 2 Stable reserve position	Response	Benefits
• Increased exploration activity yields natural gas finds sufficient enough to replace reserves used • RTP remains stable	• Priority given to projects which use little gas and go further down the natural gas value chain • Create linkages with manufacturing sector • Marketing of energy services internationally	• Economic development is advanced and deepened as greater optimisation of limited natural gas reserves is achieved • Creation of spin-off industries resulting in employment generation and improved standard of living for many

As such, National Energy has enhanced a suite of activities all geared to assist with the preparation of staff to be able to remain stable while simultaneously ensuring that we increase our dynamism and agility under this revised approach to developing projects. Increased focus on market intelligence, strategic partnerships and greater training and encouragement of innovative ideas has therefore become key initiatives to support this new approach (see Figure 1).

Companies cannot control the weather, but they can design and build a ship, and equip it with the right resources in order to navigate the high seas under all weather conditions. National Energy has taken this concept on board and is actively seeking to partner with other stakeholders to present innovative yet investable project options in the future. Given that National Energy continues to be the vehicle for executing government policy in the development and expansion of the downstream energy sector, we are keen to ensure that we develop projects for all scenario options, especially given the high level of uncertainty going forward in both the local and global landscape.

FIGURE 1

PROJECT DEVELOPMENT APPROACH: FIVE KEY INITIATIVES



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https://www.pmi.org/~/media/PDF/Publications/win-portfolio-management-practitioner-perspective.ashx

Commodity Trading – A New Line of Business for The NGC Group

Picture of LNG Carrier Gallina during loading of TTLNG's first Direct Sale Cargo at the Atlantic LNG Facility on 17th August, 2012

BY HAYDN I. FURLONGE
Commercial Manager, Value Optimisation, NGC

The National Gas Company of Trinidad and Tobago Limited (NGC) is actively engaged in growing its commodity trading business. Through the interests of its subsidiaries, Trinidad and Tobago LNG Limited (TTLNG), NGC Exploration & Production Investment Limited (NGC E&PI), and Phoenix Park Gas Processors Limited (PPGPL), NGC is engaged in making this initiative a reality. This article explores the developments taking place in the global arena and the antecedents to this strategic move by NGC.

SEEDING THE OPPORTUNITY

TTLNG is NGC's subsidiary that holds 11.11% shareholding (equivalent to US$110 million of initial capital invested) in Atlantic LNG Train 4 which started operations in 2005. The commercial arrangement afforded TTLNG processing rights and access to LNG for its own marketing under terms and conditions negotiated back in 2002. In 2012, TTLNG exercised its right to commence directly selling LNG cargoes into the global market.

If we examine closely the major LNG price indicators shown in Figure 2 (see next page), US gas prices started a downward trend in the period just after 2008, whilst European and Asian indices trended in the opposite direction. This was significant as the original TTLNG sales arrangement was linked to the US index, which was previously the most relevant and dominant price marker.

As such, the timing of this change in TTLNG's business model proved to be a good one, as the market demand and price conditions have been very favourable. The new sales approach was spot basis, meaning each LNG cargo was sold via an open tender process managed by NGC's Commercial and Legal Divisions. This competitive process would have also contributed to TTLNG obtaining the maximum value that the market had to offer at the point in time of the cargo sale. In absolute terms, the *LNG net income increased by an order of magnitude* compared to the prior arrangement.

Figure 2. HISTORICAL GLOBAL NATURAL GAS SPOT PRICES

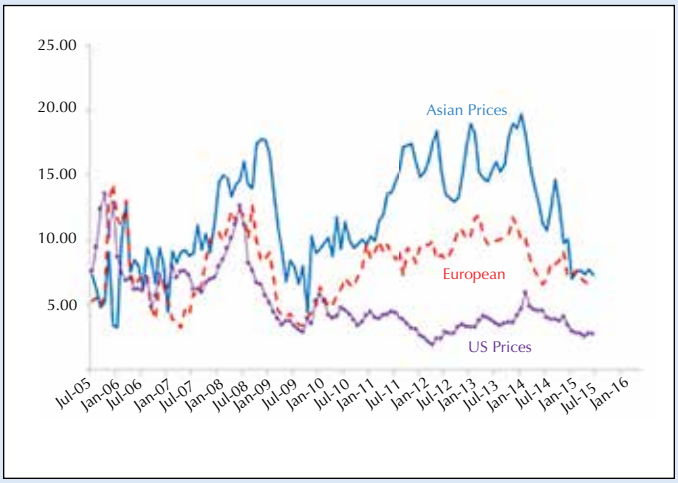
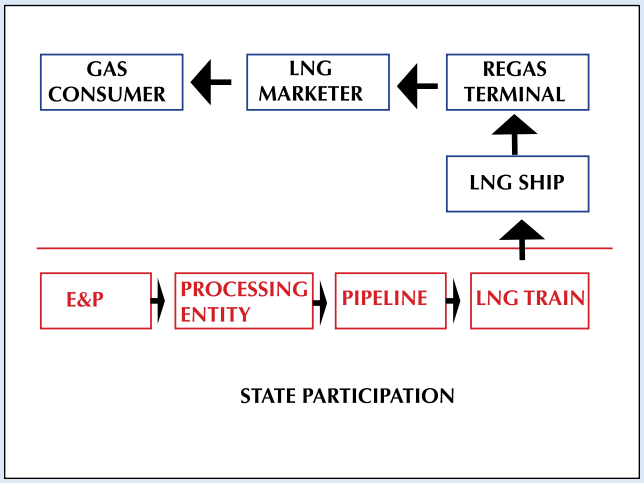


Figure 3. LNG VALUE CHAIN



PURSUING SUSTAINABLE VALUE

Monetary gains aside, the opportunities for deeper participation in the energy value chain remain to be fully exploited. If we again use LNG as an example, Figure 3 (above) shows the limited segments of the chain currently with participation by state entities. This limits the value accrued to the state in the form of taxes and dividends from the onshore segments, namely exploration and production (upstream), pipeline transportation, gas supply (midstream), and liquefaction (primary downstream).

The benefits of holding controlling positions in the gas/LNG merchant and liquefaction businesses as well as interests in the further downstream elements of the value chain include (Furlonge, 2006):

- Capturing offshore marketing value
- Increasing rewards from expanded ownership and new areas of investment
- Sharing risks along the chain
- Developing a greater level of expertise
- Increasing oversight of the distribution of value and returns to Trinidad and Tobago.

In 2014, our initiative to develop our capability in the downstream segments of the LNG chain led to NGC entering into a short-term LNG marketing arrangement which brought with it opportunities for development of our knowledge and expertise in these areas.

Since this initiative, TTLNG has sold 11 LNG cargoes to several destinations around the world, namely Brazil, Mexico, Singapore, Kuwait and India. This has served to diversify NGC's portfolio by directly accessing international gas markets, albeit for a small volume (about 30 million standard cubic feet of gas per day /30MMscfd) of gas processed).

Diversification of NGC's commodity portfolio has come about through our investment in Block 2c with entitlement to crude oil. The subsidiary NGC E&PI has sold three crude oil cargoes (all at a premium to the West Texas Intermediate benchmark) to the USA, Brazil and for use at Petrotrin's refinery. Likewise, the opportunities for further downstream business in the NGLs market is being developed. The addition of condensate and petrochemicals to NGC's commodity trading portfolio are other possibilities on the drawing board.

INDUSTRY DEVELOPMENTS

There have been rapid and fundamental changes taking place in the global energy arena. The impetus for commodity trading is even more pronounced given the following developments:

Supply Growth – the increase of USA's unconventional proved gas reserves due to shale gas commercialisation using hydraulic fracturing and directional drilling technology has shifted the global gas supply demand balance. Exploitation of tight oil sand has also increased. Earlier this year, the USA exported its first LNG from indigenous gas and first crude oil since the export ban lifting. In the longer term, coalbed methane, heavy oil exploitation, nuclear energy plant restarts and growth of clean fuel alternatives will further affect the supply side.

Changing Demand Locations – with the USA's new-found resources, its demand for energy and

Aerial view of Atlantic LNG's four Trains. Train 4 (foreground) is the largest on the facility.
Photo courtesy: Atlantic LNG Company of Trinidad and Tobago

petrochemical imports is changing. As an example, US LNG import facilities which were once major market destinations for Trinidad and Tobago's LNG have now been configured to re-export LNG, and primary petrochemical capacity and exports are rising. It should be noted that high demand growth centres have now transitioned to the developing world owing to relatively high economic and population growth rates, and demand for electricity and consumer items.

Competition from new hydrocarbon provinces – Africa, Brazil, Mexico, Suriname, Guyana and other territories are accelerating exploration activity and finding large reservoirs with potentially lower cost than the deepwater plays being targeted in Trinidad and Tobago. These not only have the potential to bring significant new regional supply, but also to compete for foreign capital. Of course, such perceived threats can be turned into opportunities by exploring outward foreign direct investment.

Panama Canal Expansion – the expansion of the Panama Canal in terms of a new lane and width to accommodate larger vessels (including the majority of LNG tankers) will significantly impact global LNG trade flows by offering an economic alternative shipping route for LNG vessels transiting from the USA and Trinidad and Tobago to Asian and Far East markets.

The cost savings from Trinidad to Japan with transit through the Panama Canal is estimated at US$1.35/MMBtu or over US$5 million per cargo. However, the potential for convergence of global gas prices could mean a reduction in Asian prices or at least normalisation of regional prices which, in the fullness of time, could erode a fraction of the anticipated destination premium. So while transit through the Panama Canal will reduce cost in one part of the LNG value chain, if market prices drop beyond the expected savings, some of the potential benefit to Trinidad and Tobago may not be realised. Another interesting implication is that shipping costs to Latin American Pacific Coast LNG importers such as Chile and Mexico will be reduced. This could open up a new market for Trinidad and Tobago that was once almost unreachable.

The implications of these developments have been major to NGC's LNG, crude oil and NGLs markets. Today's energy markets have been experiencing especially high price volatility with major impact on energy businesses around the world. Oil and oil-related product prices plunged 50% from mid-2014 to 2015 and have remained extremely low. LNG prices also halved with diminishing opportunities for capturing differences in regional prices, e.g. Atlantic and Asia prices are nearly equating.

STRATEGIC GROWTH

Given the decline in energy prices and the maturity of the country's hydrocarbon province there is critical need to establish ways of capturing as much value to benefit current and future generations from our natural and human resources. This is grounded in the Mission of NGC. The idea is to maximise value from our equity volumes (LNG, crude oil, NGLs and soon petrochemicals) by:

1. Seeking the best markets for our equity volumes;
2. Extracting incremental value in the offshore segments of the value chain for which the country's State entities have not been participating;

The implications of these developments have been major to NGC's LNG, crude oil and NGLs markets. Today's energy markets have been experiencing especially high price volatility with major impact on energy businesses around the world.

3. Becoming a global trader (i.e. purchase and sale of third-party volumes).

It is in this context and natural progression of the moves by NGC over the years that we are on the verge of taking another step change in the area of commodity trading. The approach will necessarily involve developing an international network, partnerships, systems and resources, risk mitigation, and portfolio diversification.

Consistent with our Vision, NGC is strategically positioning itself to become a global player in the downstream segment of the energy value chain.

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ENVIRONMENT & SAFETY

The Recycling Drive of the NGC Eco-Phoenix Club

NGC's Eco-Phoenix Club at the International Coastal Clean-Up at Fishing Pond Beach located along the northeast coast of Trindad, March 2016

BY ELANA THOMPSON,
EHS Assistant, EHS, NGC

The NGC Eco-Phoenix Club was launched on World Environment Day 2008 in response to the organisation's need for a paradigm shift with respect to its environmental culture. The group is currently led by Environment, Health and Safety (EHS) Assistants Abiola Mc Cree, Ciji Kent, Elana Thompson and Jamiyl Mc Dougall and Graduate Trainee, Michelle Mohammed.

The Club's activities include:

- Reduce and reuse initiatives
- Recycling projects
- Tree planting exercises
- Beach clean-ups
- Educational promotions
- Hikes and nature tours
- Competitions, movies and fun events

Guided by its Mission *"to contribute to the development of environmental conservation and preservation systems and promote the advancement of environmental quality through functional eco-efficiency, for the benefit of our company and our nation,"* the NGC Eco-Phoenix Club has driven a heavily subscribed recycling drive within NGC.

RECYCLING

The programme started modestly as a collaborative effort with The Trinidad and Tobago Solid Waste Management Company, to recycle dry cell batteries. Subsequently, the initiative expanded to recycling glass bottles – a collaborative effort with Carib Glassworks Limited – toner cartridges, plastic bottles and paper. The list later extended to the recycling and safe disposal of aluminium cans and fluorescent bulbs.

Consequently, this led to the development of quarterly recycling drives which sought to provide employees with a means of safely disposing and recycling other items. The Club realised employees were uncertain of the process of safely disposing or recycling miscellaneous items.

This recycling initiative was greatly embraced by employees to the point where larger, one cubic yard, tilt truck bins had to be procured to accommodate the volume of recyclables being brought in on a weekly basis, with the frequency of the clearing of these bins increasing from once a month to bi-monthly.

Bins were also introduced into several of our facilities to provide an easier means for our field-based employees to recycle. It is very encouraging to see employees bringing in their recycle bags as this indicates that recycling practices have been established at the microlevel of individuals and their families. Children within these households are introduced first hand to the practice of separating their waste and made conscious of the fact that there are safer ways to dispose of frequently used items such as plastic and glass bottles.

BEACH CLEAN-UPS

Tied in with the recycling drive are the Club's national beach clean-up events. At least twice a year, the Club enlists employees to get involved and volunteer for this initiative. In Q1 2013, the Eco-Phoenix Club stepped up to the mantle by assisting with the successful establishment of a beach clean-up at Fishing Pond Beach, Sangre Grande which is one of the top three turtle-nesting sites in Trinidad. This has now become an annual event with the largest turnout of over 300 volunteers being recorded last year. The group provided the items necessary for ambulance services and sponsored avid student volunteers from Junior Achievers to join in the clean-up activities. During Q3 2015, the group participated in the annual International Coastal Cleanup. Over the last three years, the Eco-Phoenix Club partnered with NGC subsidiary company National Energy to clean the La Brea Station Beach. The group has also extended this initiative to the sister isle of Tobago by joining with Police Youth Clubs and MIC students to clean the Hope/John Dial Beach.

The NGC Eco-Phoenix Club is an active member of the International Coastal Clean-up Committee, contributing to the national success of this event in both Trinidad and Tobago.

2016 OUTLOOK

Globally, 2016 welcomed the introduction of many noteworthy and historic environmental projects which aim to alleviate the damaging impact of human activities on the earth's environment – from the invention of ocean clean-up devices to the implementation of policies to prohibit the importation and use of plastic bags and styrofoam products, the latter occurring right amongst our Caribbean counterparts. This inspires Club's leaders to think of innovative ways to make positive impacts on the environment.

As such, for 2016 the Club will seek to:

- Further extend its recycling initiative at a departmental level, as well as by establishing recycle bins at all company-based events
- Support the Turtle Village Trust and Papa Bois Conservation groups with beach clean-up efforts at Fishing Pond Beach
- Partner with Ocean Conservancy for the annual International Coastal Clean-Up.

Making the Difference: The NGC Eco-Phoenix Club's recycle bins at NGC's Head Office

NGC NEWS

Introducing the New VP of GTD

Mr. Ronald Anthony Adams has been appointed Vice President, Gas Transmission and Distribution (GTD) at NGC. Formerly the Operations Manager at subsidiary company NGC CNG, Mr. Adams assumed the position of VP, GTD on 1 January, 2016.

With over 24 years' experience in the upstream, midstream and downstream energy sectors, Mr. Adams brings a wealth of information and experience to his new portfolio.

He possesses a BSc. degree in Chemical Engineering from The University of the West Indies and earned his MBA (specialising in Strategic Planning) from the Heriot-Watt University, Edinburgh School of Business.

Mr. Ronald Anthony Adams, VP, GTD

Prior to NGC, Mr. Adams was a Senior Operations and Business Development Executive with appointments at Athlon Solutions (previously Champion Technologies), Petrotrin, Ashland Chemicals, NUCOR Iron Carbide and PCS Nitrogen Trinidad Ltd.

He has significant experience in Strategic and Business Level Planning, Operations and Engineering Management and Business Development.

Gasco News wishes Mr. Adams every success in his new role as VP.

PROJECT UPDATES – LFPP AND PPVS

Liquid Fuels Pipeline Project (LFPP)

NGC has worked in collaboration with two other state enterprises, namely Petroleum Company of Trinidad and Tobago Limited (Petrotrin) and the Trinidad and Tobago National Petroleum Marketing Company Limited (NP) to manage, design, construct and commission the Liquid Fuels Pipeline Project.

The Liquid Fuels Pipeline is designed to transport at peak operations, approximately 1.7 million gallons or 40,972 barrels per day of refined distillates, specifically two types of gasoline (RON-92 & RON-95), Diesel and JET-A1 fuel. The project consists of three (3) inter-connected eight-inch diametre (8") pipelines and ancillary facilities distributed geographically across the country.

The Multi-Fuel Cross Refinery Pipeline (MFCRP) originates at the West Area, Pointe-a-Pierre Tank Farm Facility and ends at the Pointe-a-Pierre Pig Launcher Facility within the East Area of the Refinery where, it is connected to the Multi-Fuel Product Pipeline which, runs from the south of the island to the north, originating at the Pointe-a-Pierre Pig Launcher Facility and ending at the Caroni Terminal Facility (CTF), Fredrick Settlement, Caroni where a new Road Tank Wagon (RTW) Loading Rack and Distribution Facility has been constructed.

The third pipeline, a dedicated JET-A1 Fuel Pipeline (JFPL), was also constructed as part of the project to enhance JET-A1 fuel supply and availability to the Piarco International Airport. This pipeline originates at the Caroni Terminal Facility and ends at the Piarco Receiving Terminal (PRT).

It is anticipated that, the facility will be moved into phase one (P1) of operations at the beginning of April 2016, with the re-introduction of JET-A1 fuel. Thereafter, on an incremental basis, the other hydrocarbons would be brought online to achieve full operations by June 2016. This activity is heavily dependent on product availability from the refinery. However, once the refinery's supply scheduling is normalised, project completion and close out is expected to be achieved at the end of quarter three 2016.

The project handover is also being implemented on a phased basis. This activity is projected to commence between NGC and Petrotrin, at the end of March 2016 when the operations personnel who are currently engaged by NGC on behalf of Petrotrin, will be transferred to the Liquid Fuels Company of Trinidad and Tobago Limited (LFCTT), a wholly owned subsidiary of Petrotrin, which at this point is the designated operator of the entire facility. The second phase of handover is expected to be achieved by the end of June 2016 when all the hydrocarbons have been introduced into the system and the plant would have achieved full operational status.

Aerial view of the Liquid Fuels Pipeline Project

The third and final phase of the handover is expected to be achieved by end of September 2016 when the Distributed Control System which governs the operations of the plant would have been fully upgraded.

What are the benefits of the Liquid Fuel Pipeline initiative?

- The facility will replace aged top-loading fuel gantries at Pointe-a-Pierre and Sea Lots
- Reduce the dependence on Ocean Tankers and Road Tank Wagons for delivery of products
- Increase bunkering capacity at Pointe-a-Pierre, the Caroni Terminal Facility and Piarco Receiving Terminal
- Dedicate a Multi-Fuel Product Pipeline for transportation of products from Pointe-a-Pierre to Caroni Terminal Facility
- Dedicate a JET-A1 Fuel Product Pipeline for transportation of product from Caroni Terminal Facility to Piarco Receiving Terminal
- Enhance security of fuel supply and availability to population of Trinidad and Tobago as well as for aviation industry
- Eventually phasing out marine product transportation and JET-A1 handling from Pointe-a-Pierre.

Phoenix Park Valve Station

Phoenix Park Valve Station (PPVS) Upgrade

The Phoenix Park Valve Station (PPVS), located at the Point Lisas Industrial Estate in Couva, is owned and operated by NGC. It is a highly critical facility in NGC's pipeline system, designed for the collection and distribution of natural gas. It serves as the main hub for the distribution of gas to the Western part of the island. This facility receives gas from NGC's 20", 30" and 36" pipelines routed from the Beachfield Valve Station and the Abyssinia Accumulator Station and distributes gas to major end users at the Point Lisas Industrial Estate, Penal Power Station and the Petrotrin Refinery, as well as light industrial customers across the country.

The PPVS facility serves to remove liquid (inclusive of steady state liquids, pig-induced liquid slugs and/or 'swept' liquid slugs) from the gas flow, and route the gas to Phoenix Park Gas Processors Limited (PPGPL) via a 48-inch-diameter pipeline. PPVS also receives dry (residue) gas from PPGL via a "blending manifold" at Phoenix Park Intermediate Station (PPIS) for distribution to the end users at the Point Lisas Industrial Estate, and to the electric power generation plants in Port of Spain, California and Penal, among other commercial customers.

In the event that PPGPL cannot accommodate the ensure gas flow rate from PPVS, there is the option to flow on the wet gas bypass directly to the Residual Gas System. The existing PPVS facility can operate with at a rated capacity of 1.4 Bscf/d and features two slug catchers; one 30"/20" underground slug catcher, (which receives gas from the 30" pipeline from Beachfield via Seecharan Trace Valve Station and the 20" pipeline from Beachfield via Picton Valve Station); and one 36" aboveground slug catcher (which receives gas from Beachfield via Picton Valve Station).

In 2005, NGC undertook the PPVS Upgrade Project. This project is designed to increase the rated capacity of the PPVS facility to 3 Bscf/d and it involves:-

- Installation of a new slugcatcher with the capability to handle 3.0 Bscf/d of gas and the capacity for 4,000 barrels (bbls) of liquid
- Replacement atmospheric condensate storage tanks with pressurised storage vessels and increase capacity by 50% (2,775 bbls)
- Installation of a flare system to manage vent gases emitted during routine operations
- Installation of a fire and gas detection and emergency isolation systems

The project is 90% complete and the completion date has been revised to October 2016.

While the project has been handed over to NGC's GTD

Division, the remaining works are still being managed by the Projects Department of Construction Services.

The outstanding works for completion of the project include:

1. Installation of new Rotork IQ3 Actuators
2. Modification of the Process and Safety Control System – The Emergency Shutdown System philosophy will be modified to allow for operator intervention as the facility is now manned.
3. Complete Mechanical Tie-Ins
4. Commissioning of the facility.

What are the benefits of the PPVS Upgrade Project?

- Improved safety, reliability and operational flexibility of the facility
- Improved reliability of the slug-catching facilities and their capability
- Installation of flaring capability to mitigate against safety risks at the facility associated with venting of flammable gases
- Cost-effective removal of hydrocarbon condensate from the station
- Replacement atmospheric condensate storage tanks with pressurised storage vessels and increase capacity by 50% (2,775 bbls).

NGC-sponsored Steelbands Update

Cross-section of the NGC Couva Joylanders members at its panyard 'lime'

NGC is the title sponsor of three steelbands: NGC Couva Joylanders, NGC La Brea Nightingales and NGC Steel Xplosion (Tobago). NGC also provides support to Gonzales Sheikers.

In a bid to show support for the bands on the eve of their participation in Panorama 2016, the Company hosted panyard limes for its title sponsor bands at their various panyards.

NGC Couva Joylanders, NGC Steel Xplosion (Tobago) and Gonzales Sheikers all qualified for the Panorama finals.

NGC recognises that the performance and hard work of each steelband's members represent a love for our culture and a devotion to the art form. That is why we invest our time and resources into the development of these aspiring steelbands. *Gasco News* offers all the steelbands heartfelt congratulations on a successful Carnival 2016 season!

CAER Update

NGC's Community Awareness and Emergency Response (CAER) programme was conceptualised in 2006. The programme was developed around the theme 'How to be safe and smart with natural gas.' Primary targets were schools, both at the primary and secondary levels, where NGC performed safety assessments and awareness training to encourage schools to improve their emergency response plans in the event of a natural gas-related emergency.

In 2015, NGC's External Communications Department, with assistance from the Company's EHS Department, undertook the continuation of the programme. The NGC team conducted safety assessments, based on requests from several schools, including some that fell along the East-West corridor and those located within 700m of NGC's natural gas pipelines. Thereafter, NGC's EHS Officers prepared a number of recommendations regarding which schools needed basic safety items to ensure an adequate emergency response by the schools. NGC then committed to purchasing the recommended safety items comprising:

- High visibility vests
- First aid kits
- Emergency lights
- Muster point signs
- Smoke detectors
- Exit signs
- Fire extinguishers
- Air horns
- Stop signs

The items are distributed in batches. The first batch of deliveries involved distribution to 15 schools. A second batch of items is scheduled to be procured and distributed to the remaining 12 schools. NGC employees from GTD and Construction Services volunteered to deliver the safety supplies to the respective schools. Via CSR initiatives such as NGC's CAER programme, the Company fosters meaningful relationships with the national community while encouraging a safety culture amongst schools.

Mr. Andrew Ali, A&M Technician, delivered safety items to Barrackpore West Secondary School

Mr. Yasin Ali, Construction Inspector, delivered safety items to the Arima Presbyterian Primary School

Delivery of Safety Supplies to Schools

In 2015, the following schools were provided with safety assessments and safety equipment:

- Arima Presbyterian Primary School
- Barataria Boys' R.C. Primary School
- Barataria North Secondary School
- Barataria South Secondary School
- Barrackpore West Secondary School
- El Socorro Central Government Primary School
- El Socorro South Government Primary School
- Mt. Hope Junior Secondary School
- Penal Secondary School
- Preysal Secondary School
- Rio Claro West Secondary School
- Sevilla Private Primary School
- Spring Village Hindu Primary School
- St. Augustine South Government Primary School
- St. George's College

In the first quarter of 2016, the following schools will receive safety equipment:

- Aranguez Government Primary School
- Belmont Junior Secondary School
- Holy Name Convent, PoS
- Mt. Lambert R.C. Primary School
- Mucurapo Girls' R.C. School
- Polytechnic Sixth Form School
- Providence Girls' Secondary School
- St. Agnes A.C. School
- St. Crispin A.C. Primary School
- St. James Secondary School
- St. Theresa's Girls' R.C. Primary School

Update on Extension of National Energy's Head Office

Extension works in progress at National Energy

Construction of National Energy's Head Office extension commenced in May 2015 and since then, work has been progressing towards completion at the end of June 2016. Contractor Alpha Engineering & Construction Services Limited, is working under the supervision of the Infrastructure Planning and Development Department to deliver the project on time and within budget.

As at the end of March 2016, major works to the building have been completed and contracts have been awarded for the completion of mechanical and electrical, tiling, ceiling, partitions and other finishing works. Paving of the new main access road which will run along the western perimeter of the compound has been completed.

The building is expected to house the NGC CNG staff, as well as much-needed accommodation for National Energy and NGL employees on the first floor.

LABIDCO NEWS

Update on the Repairs to Berth 2

Berth 2 repairs in progress

National Energy, in collaboration with La Brea Industrial Development Company Limited (LABIDCO) is responsible for the repairs to Berth 2 at the Port of Brighton. The repair work continues to be one of National Energy's strategic priorities for 2016, as the berth will support new business at the port, a main source of revenue for LABIDCO. The project which began on 18 June, 2015 is currently underway and is expected to be completed by May 2017.

To date the overall completion of the project is at 60%. Milestones achieved to date include the installation and testing of all the piles required to support the designated heavy load platform and the construction of 92m of the combi-wall. The contractor for the project, Soletanche Bachy Cimas, is currently in the process of backfilling the excavation for the heavy lift platform. Upon the completion of this phase the reinforcement for the platform will be installed and concrete cast.

Thus far, approximately 36 persons from La Brea and environs have been employed on the project directly by the contractor, representing 44% of the total manpower as local content. As work continues there have been no loss time accidents or other health and safety incidents.

The repairs to Berth 2 are also linked to Trinidad Offshore Fabricators Company Limited's (TOFCO) ability to deliver its section of the bpTT's Juniper Platform on schedule. Given the national importance of this platform, National Energy is making every effort to ensure adherence to the established project timelines.

NGC CNG NEWS

CNG Rebate for Employees

CNG station at NGC's Warehouse Facility, Pt. Lisas

Employees of the NGC Group (NGC, National Energy, PPGPL and NGC CNG) now have access to CNG for their personal vehicles at minimal cost. The Board of Directors of NGC CNG in December 2015 approved a proposal to allow employees with OEM CNG vehicles or converted CNG vehicles to fill up at the CNG station at the NGC service station situated on NGC's Warehouse Facility, Pt. Lisas.

This offer is for 24 continuous months and is applicable to one vehicle per employee, owned either by the employee, a spouse or parent. The rationale is to engage NGC Group employees to use the fuel as part of the mandate of NGC CNG to accelerate its use in Trinidad and Tobago. Employees have to submit an application form and other documents for approval, before they can access the offer.

Once approved, employees can fill their vehicles at the service station between normal working hours Monday to Friday. Meetings to roll out the offer were held with all companies of the NGC Group in February and the initial response has been encouraging.

It is estimated that employees who currently use super or premium in their vehicles can save as much as 90 per cent on their fuel bill if they convert to CNG and access the offer. Currently, CNG is priced at $1.00/litre gallon equivalent and is the most affordable vehicular fuel available in Trinidad and Tobago. CNG also emits 30 per cent less carbon dioxide than gasoline or diesel. The offer expires on 31st December 2018.

Briefing session on the CNG Rebate programme for employees

CNG Fuel Station Network Set to Expand

A CNG bus refueling at the CNG Service Station on the PTSC Compound, City Gate, Port of Spain

A dramatic expansion and upgrade of the CNG supply infrastructure across Trinidad and Tobago is anticipated in 2016. A key aspect of the mandate of NGC CNG is to improve the supply of CNG nationally and that effort is well and truly underway. This year, it is expected that new compressing, storage and dispensing equipment will be installed in eight new fixed stations, six current stations will be upgraded with new equipment and five mobile units will also be deployed.

Two sets of fixed CNG station equipment arrived in January and another two sets came in February. The eight new supply points across the country are: St Christopher's, Port of Spain; Massy Compound, Orange Grove; O'Meara, Arima; Starlite, Diego Martin; PTSC permanent station, City Gate; Santa Flora, Tumpuna; and McBean, Couva. Equipment at the following existing stations will be upgraded in 2016: Beetham, Chaguanas, Rushworth Street, Mon Repos, Barataria and Mt. Lambert. St Christopher's and NP Orange Grove will be the first stations to have the new equipment installed and commissioned.

The mobile units started arriving in Trinidad and Tobago in December 2015. They can be deployed to areas where stations are being upgraded or in locations where there is demand but no fixed station like Tobago. All these stations will have new equipment with increased capacity which can fill on average 500 passenger cars daily.

320 'HT' vehicles to use CNG Gas in Coming Months

As part of its mandate to accelerate the use of CNG across Trinidad and Tobago, NGC CNG invited Expressions of Interest (EOI) from vehicle owners in the Heavy and Extra Heavy Duty (HT) market segment. The Expression of Interest was for companies to be considered to receive funding if they were willing to switch all or part of their fleet to CNG or utilise CNG technology in some way.

The fuel bill for fleet owners is a key component of their operating cost. Most fleet owners use diesel, priced at $1.72/litre, as their fuel of choice for heavy duty and extra heavy duty vehicles. Switching to CNG, at a $1.00 litre gallon equivalent, would save fleet owners a significant amount on their fuel bill, with the added benefit of lower maintenance costs and a reduced carbon footprint.

The EOI invited fleet owners to indicate how many vehicles they wanted to convert to CNG, as well as an expected time frame and demand potential. According to the advertisement for the EOI, priority consideration would be given to:

- State (Public) Sector
- Light Industrial Commercial (LIC) Sector
- Private Companies serving the Public Interest
- Private Companies with Private Interest

The grant can be used for the purchase of CNG technology approved by the Ministry of Energy and Energy Industries or for conversion of existing vehicles to use CNG as a source of fuel. The response to the EOI was very encouraging with requests for approximately 320 Heavy Duty vehicle conversions from nine companies. The EOI closed on 12 February 2016.

PPGPL's Propane Recovery Improvement Project

PPGPL conducts a combination of routine and non-routine maintenance and plant improvement projects to ensure safe, full operations at its plant facility

During the last quarter of 2015, PPGPL conducted a plant maintenance turnaround on one of its gas plants during which, one of the main activities was the tie-ins for the Gas Plant 2 Propane Recovery Improvement Project. Throughout PPGPL's 24-year history, the company has developed a robust mechanical integrity programme that is continually being improved. Ensuring that the plant facility is fully operational in a safe manner requires a combination of routine and non-routine maintenance and plant improvement projects. In 2015, PPGPL sought to address a low propane recovery issue due to the reduced gallons per minute (GPM) of gas coming to the facility for processing. The NGC's inlet gas GPM has decreased over the last three years resulting in a negative impact to propane recoveries to below the design of 95% on Gas Plant 2.

To maintain high propane recovery levels under these low GPM conditions, colder temperatures are required. However, at these colder temperatures, operating limitations exist on the Brazed Aluminium Heat Exchanger. The PPGPL Production Management team developed a solution to ensure that propane recoveries can be maintained on the Gas Plant 2 under this falling GPM inlet gas environment. The solution entailed the addition of two pumps with the requisite piping and controls to return a warmer stream of fluid. This warmer stream would create the necessary conditions for the improved propane recovery.

To date, through a collaborative team effort, the mechanical and electrical tie-ins were successfully completed during the turnaround after which the pumps will be installed as scheduled. These installation works are carded to begin during the last quarter of 2016 with commissioning in 2017.

INDUSTRY NEWS

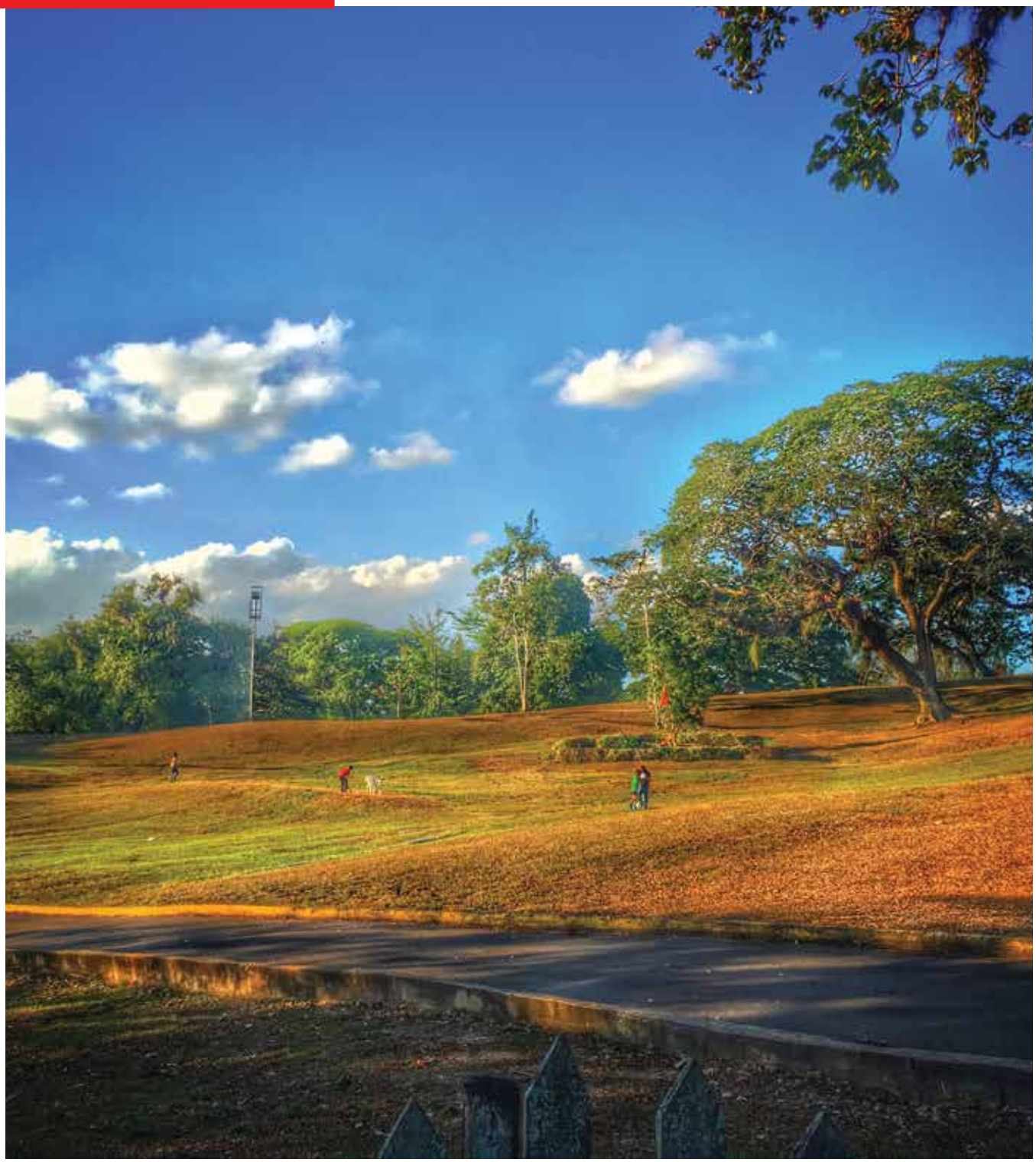
Juniper Platform Achieves Major Milestone

Juniper Platform construction in progress

Juniper will be bpTT's 14th offshore production facility and the project involves the construction of a normally unmanned platform together with corresponding subsea infrastructure. The facility will have a production capacity of approximately 590 MMscf/d.

Fabrication began in 2014 at the fabrication yard of the La Brea Industrial Estate. The energy sector got some welcome news on Thursday 18th February 2016 with the lifting of the Juniper Platform's main deck onto the cellar deck. The Project achieved this major milestone ahead of the original projected deadline of 20 February 2016.

At the beginning of 2016, there were growing concerns over the lost time experienced on the project but according to Mr. Glenn Earles, General Manager TOFCO, the company responsible for constructing the 4,500 tonne topsides, the Juniper Platform is well on its way to its 3rd December sailing target. TOFCO is pleased with the progress of the Juniper project, and the contribution made by the residents of La Brea, boasting that 63% of its current workforce comprises persons from La Brea and environs.



TO REFLECT ON THE BEAUTY THAT SURROUNDS US HERE IN TRINIDAD AND TOBAGO

Palmiste Park is a 40-acre oasis nestled on the outskirts of San Fernando in south Trinidad. It is an outlet for outdoor recreation for local residents and features a heart-shaped pond, jogging pathway, picnic areas, and nature trails. *Photo: Nic-Connor Alexander*

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