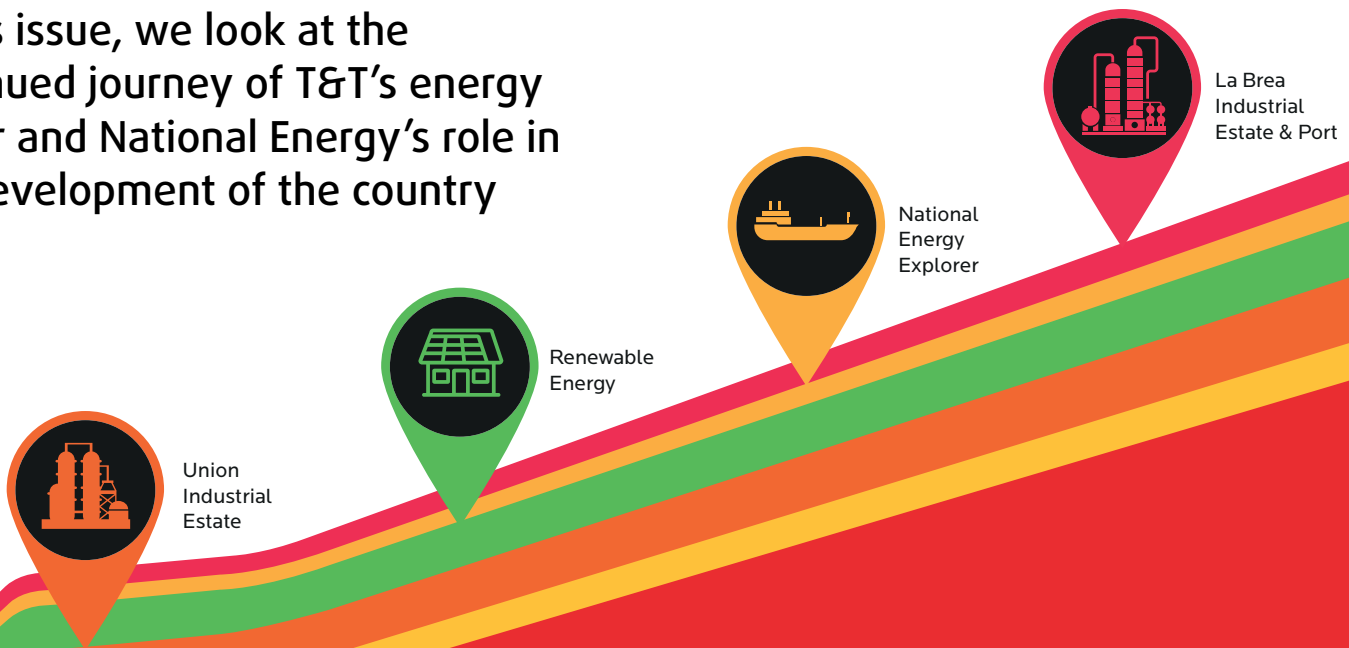


PIONEER

A Path to Possibilities

In this issue, we look at the continued journey of T&T's energy sector and National Energy's role in the development of the country



LABIDCO Celebrates
20 Years of Service **pg 4**

Shell's Acquisition of BG Group
– The LNG Factor **pg 14**

The Establishment of a
Greenfield Buffer Zone at
Union Industrial Estate **pg 16**



The Path to Possibility

By T. Gidharry

Possibility is the pathway to reality. Creating possibility involves identifying opportunities for growth so as to achieve success. The journey to possibility is not constrained by cost, time or scope, but rather driven by persistence. Whether it is on land via our industrial estates, sea through our fleet of vessels, including the new fast crew supply vessel, or that space in between, with our terminals and ports such as the Port of Galeota, National Energy serves as Trinidad and Tobago's path to possibility in the energy sector.

National Energy was conceived from the idea that it was possible to monetise our local natural gas resources. This resulted in National Energy's involvement in the construction and operation of the early petrochemical plants and the port and marine infrastructure which services all plants at the Point Lisas Industrial Estate

(PLIE). Continuing along this path, National Energy's mandate includes the promotion of new gas based energy industries and to provide the supporting infrastructure for these investments which involves traveling further down the gas value chain to diversify the local economy.

In keeping with this responsibility, National Energy currently aids in the implementation of new industries that will not only require our natural gas, but our methanol, ammonia and other gas derivatives as a raw material. Most recently, National Energy facilitated the signing of four (4) agreements to develop a Natural Gas to Petrochemicals Complex for the Production of Methanol and Dimethyl Ether (DME) to be located at the Union Industrial Estate (UIE) in La Brea. This will be the first major industrial project to be located at UIE and therefore encourages the possibility for employment creation and greater economic development in South Trinidad.

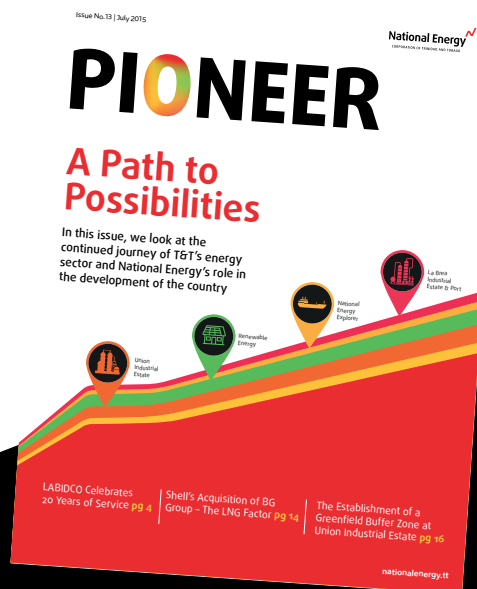
“The journey to possibility is not constrained by cost, time or scope, but rather driven by persistence.”

The intention is for UIE to become akin to the PLIE, and help to expand the services provided by companies located on the La Brea Industrial Estate. This estate is currently owned by the La Brea Industrial Development Company Limited (LABIDCO) and managed by National Energy.

LABIDCO celebrates its twentieth (20th) anniversary this year. Throughout its existence, LABIDCO has represented the possibility of expanding new downstream natural gas industries for Trinidad and Tobago. Businesses have grown with marked enhancement in the provision of successful services to our energy and other related sectors.

To create a more diversified pathway, National Energy not only focuses on natural gas-based projects but renewable energy as well. One such project initiated by the Ministry of Energy and Energy Affairs (MEEA) was the construction of a solar house. The project represents the potential for a “greener” Trinidad and Tobago through a reduced dependence on natural gas for electricity generation and lower greenhouse gas emissions. This could conceivably allow for a more abundant supply of natural gas for future downstream opportunities.

It is only through pursuing possibility that ideas become future realities. We at National Energy embrace our responsibility in contributing to that future for Trinidad and Tobago. In this issue we will look at the continued journey of Trinidad and Tobago’s energy sector and National Energy’s role in the continued development of our country.



Contents

BUSINESS

- 4–8 **LABIDCO Celebrates 20 Years of Service**
- 9 **National Energy Explorer On Board**
- 12–13 **Project Agreement Signed for Gas to Petrochemicals Complex**
- 14–15 **Shell’s Acquisition of BG – the LNG Factor**

ENVIRONMENT, HEALTH, SAFETY & SECURITY

- 16–17 **The Establishment of a Greenfield Buffer Zone at Union Industrial Estate**
- 18 **Solar Update**

PEOPLE

- 10–11 **Celebrating Sport, Culture and Valentine’s Day**
- 19 **10 Questions with Mary Mohammed**

Contributors

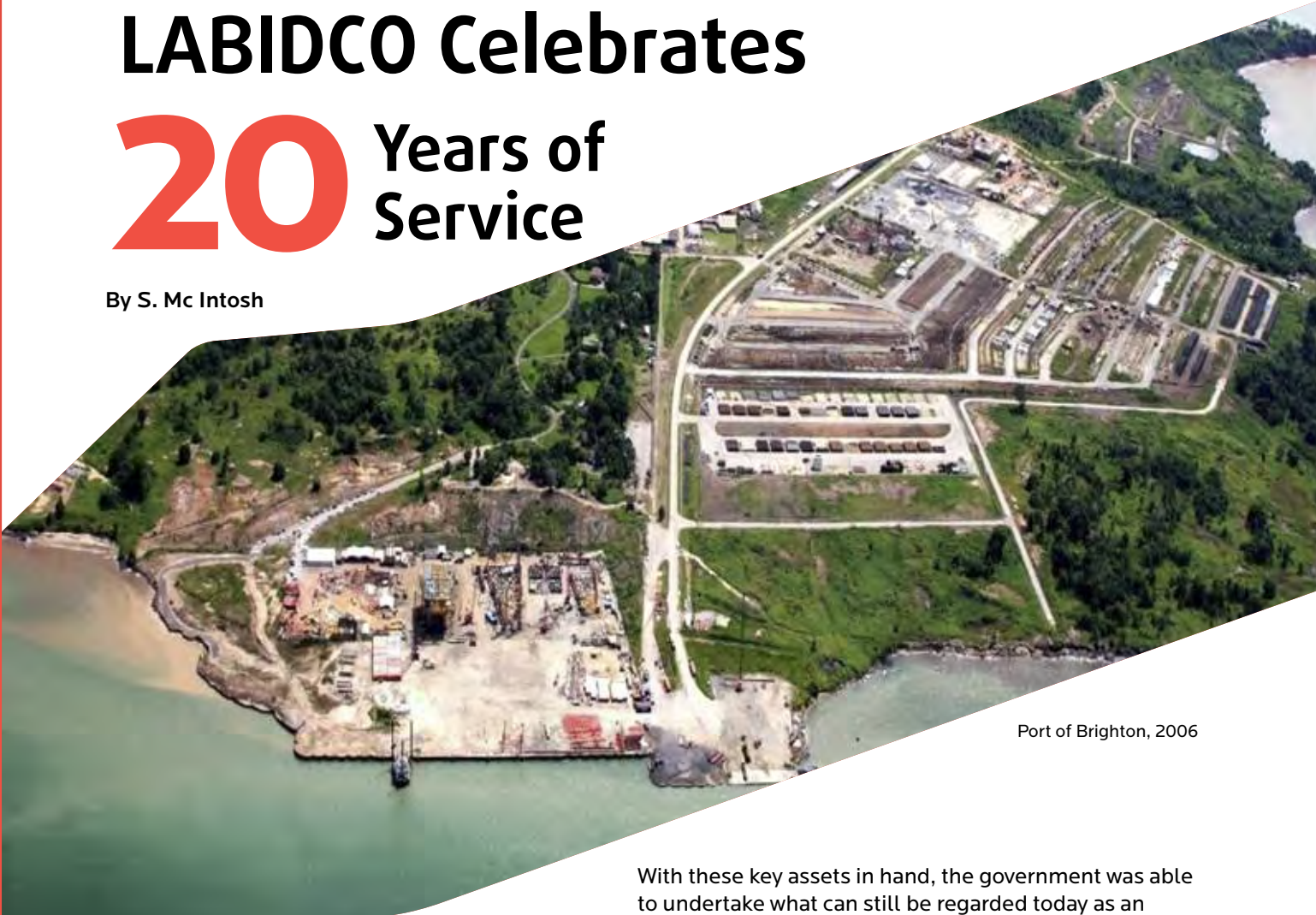
A. Cazaubon, C. Thomas, S. Mc Intosh, K. Whitehall-Morren, N. Victor and C. Mahabir



LABIDCO Celebrates

20 Years of Service

By S. Mc Intosh



Port of Brighton, 2006

In the 1970's, Trinidad and Tobago embarked on an aggressive phase of industrialisation with the government of the day leading the thrust to monetise the country's hydrocarbon resources. This process saw the formation in 1975 of strategic state entities including The National Gas Company of Trinidad and Tobago Limited (NGC) and the Coordinating Task Force which was formalised as National Energy Corporation of Trinidad and Tobago Limited (then "NEC") in 1979. By 1976, the government had also acquired the majority shareholding in Point Lisas Industrial Development Corporation Limited (PLIPDECO) through which previous owners, The South Trinidad Chamber of Commerce, had managed the Point Lisas Industrial Estate and Port of Point Lisas.

With these key assets in hand, the government was able to undertake what can still be regarded today as an astounding feat of industrial business development of which the Point Lisas Industrial Estate was the flagship project. Throughout this period of rapid expansion, methanol, ammonia and steel plants came into fruition with support services clustering around them. Point Lisas Industrial Estate quickly developed into the petrochemicals and steel hub of the Caribbean and by 1995, the estate was approaching full capacity.

There was a critical need for another industrial estate to accommodate further advancement of the energy sector. After consideration of several sites, the decision was taken by Cabinet to develop the La Brea Industrial Estate in south-western Trinidad. The site met various criteria, including its close proximity to a natural deep-water harbour. The site which also possessed a large, contiguous parcel of land (minimum 1,000 acres), was zoned for industrial use and owned by the State.

In the 1970's, Trinidad and Tobago embarked on an aggressive phase of industrialisation with the government of the day leading the thrust to monetise the country's hydrocarbon resources.

On February 15th 1995, the La Brea Industrial Development Company Limited (LABIDCO) was incorporated – owned jointly by NGC with 83% shareholding and the Petroleum Company of Trinidad and Tobago Limited (PETROTRIN) with 17%. LABIDCO was managed by National Energy on behalf of the shareholders, an arrangement that remains today. After twenty (20) years of operations, we reflect on LABIDCO'S journey towards becoming a profitable economic enterprise and steadfast contributor to the social fabric of La Brea and environs.

The Dream Takes Flight

LABIDCO's initial mandate was the management of the La Brea Industrial Estate which was being developed to accommodate the Farmland MissChem Ammonia Plant and the Atlantic LNG (ALNG) Plant along with relevant support services. To facilitate the construction of these plants, Phase 1 of the estate was developed, comprising approximately 400 acres of land and a construction dock which was dredged to a depth of 6 metres (Chart Datum) to accommodate vessels of 140 metres length and 15,000 deadweight tonnage. A drainage system was also established and a marshalling yard for storage of construction materials was built. Access to the estate was achieved through the construction of a 40 metre wide access corridor which comprised a 12 metre wide utility corridor and a 16 metre wide pipeline corridor.

Unfortunately for LABIDCO, within the company's first year of operations, both anchor projects for the new estate were relocated due to various contributing factors. ALNG went to Point Fortin and Farmland MissChem moved to Point Lisas North. This was a major blow for the fledgling company which needed to quickly devise ways to generate revenue and recover development costs. It was a credit to the management team at the time, led by Mr. Prakash Saith, Manager – Infrastructure Planning & Development, who showed great resilience in the face of severe economic and political pressure, that LABIDCO was able to keep its doors open.

The management team developed and implemented a new business strategy which moved away from heavy industry and instead targeted small – medium-sized energy services and manufacturing companies. Bio-remediation services which had initially been used to treat the soil at La Brea Industrial Estate were also offered to local oil companies in addition to storage and support facilities.

To facilitate growth based on the new strategy and attract the target market, further infrastructural works were required at the estate. After careful consideration of the socio-economic impacts and financial projections of the new direction, the LABIDCO Board took a decision to pursue construction of a secondary road and the sub-division of the estate into smaller parcels of land which were made available for lease. Fifty-six plots were created in the process and local energy services companies started to show interest in the new estate. Some of the earliest tenants at La Brea Industrial Estate were Gordon Winter, Kenson Production Services Limited and Gen-Fab Limited. Kaizen Environmental Services Limited operated the bio-remediation facility and Trinmar expressed interest in transporting offshore crews at the Port.

When asked about those early days, the two (2) remaining staff members from the original LABIDCO team – Mrs. Marva Bellamy-Bostic and Mrs. Erica Joseph-Williams – recall the atmosphere of camaraderie among employees. Mrs. Bellamy-Bostic stated, "There was a sense of personal ownership of LABIDCO that still prevails today. I was relocated to NGC Accounting Department for a while, but my heart was always with LABIDCO." Mrs. Joseph-Williams pointed out, "We put up money to cook cowheel soup and punch every month. The sharing and participation of staff will always stand out in my memory."



Demolition of Brighton Jetty, 1993

Investing in Human Capacity

As the majority shareholder of LABIDCO, NGC initiated an active community involvement programme to benefit the residents of La Brea and environs. The thrust was aimed at building capacity in the community so that residents could take advantage of employment opportunities when they became available. The idea was to empower people to not only be eligible for work at the estate, but also to grow their own businesses and market their skills throughout the country.

Some of the programmes implemented included the Marine Environmental Awareness Programme (MEAP) in which young people learned skills such as boat-building and repair. The Youth Sail Caravan holiday camp which taught various maritime-related activities was also hosted in the La Brea area.

LABIDCO took on the role of liaison between contractors and residents by encouraging community groups to organise themselves into skills banks while simultaneously encouraging contractors to utilise indigenous labour as far as possible. Town meetings were

also held within the community to inform residents about the potential impacts of the change in use of the estate. Under the auspices of LABIDCO, repair work was also initiated on the St. Helena Home for the Aged and the project was subsequently completed by NGC.

Entering a New Growth Phase

By 2003, LABIDCO had started to find its rhythm with the company's operations showing modest profits derived primarily from revenue earned through storage of pipes for NGC's 56" Cross Island Pipeline project. At the time, the construction of the Fabrication Yard was also underway. This project, completed in 2004, would become the country's largest site for fabrication of offshore platforms and a major revenue earner for LABIDCO.

Beyond its contribution to profitability, the Fabrication Yard paved the way for increased local content in the upstream oil and gas business. The achievements at this facility proved conclusively that Trinidad and Tobago possessed the capacity to deliver world-class projects of this nature when BHP Billiton's Kairi I was completed at the construction dock in 2004, and bpTT's Cannonball



LABIDCO's first office building,
Bungalow 14

Platform was completed in 2005. Eight (8) more platforms were constructed at the site from 2006 to 2010, when there was a slow-down in offshore activity. In 2011 the Fabrication Yard also saw the successful completion of dry-docking of three (3) vessels from National Energy's fleet, further underscoring LABIDCO's commitment to local content and capacity-building.

LABIDCO faced many challenges in the process of transitioning the La Brea Industrial Estate and the Port of Brighton into commercially viable operations. The company was confronted with the task of attracting new tenants and port users, while simultaneously upgrading land and port infrastructure. All this was being done with limited human and financial resources as the company sought to balance growth in regard to both market size and profitability.

The company responded by focusing on customer service, and building relationships with tenants and port users. Regular meetings were held to gain an understanding of tenants' infrastructural needs and find solutions. Additionally, services were utilised from existing tenants on the estate where practicable, to support the growth of the facility. The availability of storage, as well as the efficiency of the Port of Brighton, compared to other, heavily-subscribed ports in Trinidad, was also leveraged to attract users to the Port.

The LABIDCO Journey Continues

Today, the Fabrication Yard continues to be an important part of the local energy landscape with the bpTT Juniper Platform currently under construction. The Port of Brighton has also become a hub of activity with boulders and aggregate material for the Point Fortin Highway construction being received there. The La Brea Industrial Estate is now home to thirty-eight (38) tenants involved in a range of activities including bioremediation, rig fabrication, and repair and logistical support services.

Also ongoing is the development of a new strategic plan for LABIDCO to meet the needs of the evolving energy and manufacturing sectors. Part of this plan includes the expansion of the Port of Brighton for which project elements are at varying stages of project development. The expansion will create three (3) additional berths and is therefore expected to boost both quay-side and backland activity at the port. Additional storage and warehousing facilities would also be made available to port users subject to demand.



The LABIDCO story is one of triumph in the face of challenges and determination in the face of disappointment. This is a testament to the perseverance of the visionaries who paved the way for the development of the southwestern peninsula, which continues today. On the occasion of the 20th Anniversary of Incorporation of LABIDCO, National Energy salutes all those who contributed to building the company. Our wish for LABIDCO is that it continues to innovate and shine as a beacon of hope for the people of La Brea and environs and by extension, the people of Trinidad and Tobago.

Port of Brighton, 2013



National Energy Explorer ON BOARD

By K. Whitehall-Morren



In the early hours of the morning on January 8th 2015, the National Energy Explorer sailed with its first cargo from the Port of Galeota, destined for The National Gas Company of Trinidad and Tobago Limited (NGC)'s Teak and Poui platforms. National Energy's parent company, NGC, has signed an agreement as the first user of the new Fast Crew Supply Vessel with several other companies also expressing interest in utilising the service.

The National Energy Explorer was officially welcomed to the company's reliable and technologically advanced fleet, which includes three workboats, five tugs and one passenger launch vessel on Wednesday, 3rd December 2014. The "Welcoming Ceremony" was held at Hyatt Regency Trinidad under the patronage of the Minister of Energy and Energy Affairs, Senator the Honourable Kevin Ramnarine and was attended by several marine stakeholders.

The vessel is 53.25m in length and has a speed of 22 knots per hour with a maximum draught of 3.20m. It can accommodate 88 persons on board inclusive of eight crew members. The crew accommodations include a captain's cabin, an officer's cabin, six crew cabins, cold storage, a pantry and a mess.

The Explorer is also the first of National Energy's vessels to become computerised, having been outfitted with a Latitude 14 Rugged Laptop with heavy-duty components that can withstand shocks, drops and vibrations. The laptop will allow reports required by the Operating Assets team to be signed securely, using Adobe Echosign, and sent via a secure website to Operating Assets personnel. The state-of-the-art computer system is protected by mechanical doors with class-leading IP-52-rated ingress protection to guard against dust and water. The RGB backlit keyboard is fully protected and water-resistant, and the system is built to last under extreme temperatures with QuadCool™ thermal management.

The computerisation of the vessel is part of National Energy's year-long Business Intelligence Plan (BI) which will enhance systems to allow the company to gather, store, access and analyse corporate data to aid in decision-making.

The technologically advanced National Energy Explorer is expected to position National Energy as the fast crew provider of choice to cater to the needs of the exploration and production operators on the east coast. We welcome the National Energy Explorer on board!



Celebrating Sport, Culture and Valentine's Day

1. Taking steelpan music to new heights
2. Southeast Schools Steelpan Festival winners (secondary) – Mayaro Government Secondary School
3. La Brea Zonal Games 2015
4. Elderly citizen enjoys the token at Valentine's Day Luncheon
5. Players in deep concentration on their performance at Southeast Schools Steelpan Festival
6. Southeast Schools Steelpan Festival winners (primary) – Mafeking Government Primary School
7. National Energy employees compete in We Play Day to benefit children with Down syndrome
8. Sharing love with our senior citizens for Valentine's Day



1.



2.



6.



5.





Project Agreement Signed for Gas to Petrochemicals Complex

By A. Cazaubon

The signing of the Project Agreement on April 10th, 2015, at the National Energy Skills Centre (NESC) in Vessigny, La Brea, signified the achievement of another major milestone in the development of the Natural Gas to Petrochemicals Complex for the Production of Methanol and Dimethyl Ether (DME) at the Union Industrial Estate, La Brea.



Four (4) Agreements were executed on that day:

1. Project Agreement among Government of the Republic of Trinidad & Tobago, National Gas Company of Trinidad & Tobago, Mitsubishi Corporation, Mitsubishi Gas Chemical Company Inc., Massy Holdings Limited, Caribbean Gas Chemical Limited and Caribbean Gas Chemical (Barbados) Limited.
2. Gas Sales Contract between Caribbean Gas Chemical Limited and the National Gas Company of Trinidad & Tobago.
3. Memorandum of Understanding between Caribbean Gas Chemical Limited and Japan Bank for International Cooperation.
4. Engineering, Procurement and Construction (EPC) Agreement between Caribbean Gas Chemical Limited and Mitsubishi Heavy Industries.



President of National Energy, Dr. Vernon Paltoo (right) greets President and Group CEO of Massy Group, Mr. Gervase Warner at signing ceremony.

Almost two years ago, the Project Development Agreement (PDA) was executed among the Government of the Republic of Trinidad and Tobago, National Gas Company of Trinidad and Tobago, National Energy Corporation of Trinidad and Tobago, Mitsubishi Corporation, Mitsubishi Gas Chemical Company Inc., Massy Holdings Ltd and Caribbean Gas Chemical Limited on April 8th, 2013. The execution of the Project Agreement as an essential contract brings the PDA and development phase to an end and represents the beginning of the project implementation phase. Pending the final approval by project lenders, the construction is expected to begin in 2015 and commercial operations to start in 2018.

At the signing ceremony, Energy and Energy Affairs Minister Kevin Ramnarine gave the feature address in which he noted the following:

1. The methanol-to-dimethyl ether (DME) project will bring:
 - a. an investment of US\$987 million (30 per cent of which will be financed through equity and 70 per cent through debt);
 - b. the creation of 2,000 construction jobs and 180 permanent jobs;
 - c. further diversification of the economy and more development in the south western peninsula.

Minister Ramnarine indicated, "This is the most advanced a petrochemical project has come in the last twelve (12) years and we think it's a signal of confidence by Japanese investors in Trinidad and Tobago. It will lend to the development of the south western peninsula". He also explained that NGC could earn between US\$234 million to US\$489 million from the sale of methanol and dimethyl ether (DME), when the new petrochemical complex comes on stream. He noted, "The project brings the National Gas Company into the downstream of the natural gas value chain and NGC has 20 per cent of this project." NGC will be able to market DME and methanol and will also receive dividends on the project as well as revenues from its sale of natural gas to the complex.

National Energy fulfilled all of its obligations under the PDA and supported attainment of this milestone in negotiating the Site Lease and Berth User Agreements, both of which are additional essential contracts for the project. As the project implementation phase progresses, National Energy will continue to support the project by ensuring the necessary infrastructure is in place during construction and eventual operation of the facility.



Shell's Acquisition of BG Group – The LNG Factor

By C. Thomas

Overview

The biggest oil and gas deal in a decade. That is how it was publicised and touted, and indeed it is. Locally, almost every newspaper or industry analyst has given his/her opinion on the deal with most pronouncing that it is good for the country. Others have weighed-in on the intended impact (if any) on the change in ownership of Atlantic's LNG assets.

Shell's acquisition of the BG Group in a cash and stock deal valued at around £47 billion or US\$70 billion will see BG shareholders owning 19% of Shell. The combined entity will have net proved hydrocarbon reserves of approximately 16.7 billion barrels of oil equivalent and a reserve to production ratio of around 12.4 years. In addition, the acquisition would increase its oil and gas reserves by 25% and its production capabilities by 20%.

Back in 2013, Shell's executive in charge of global strategy claimed that their focus from 2013 onwards was on organic growth. However, with the drop in oil prices over the last ten(10) months by just under 60%, BG Group, like other mid-sized energy companies that have faced significant share price reductions have ended up in the firing line for super-majors like Shell and Exxon. Shell's decision to acquire BG therefore is opportunistic and also probably a revision in strategy given the lower cost of acquiring a company whose reserve replacement ratio is positive. A positive reserve replacement ratio implies that BG continues to add more to its energy reserves than it produces annually.

In essence, in the worldwide hunt for energy, Shell has made a US\$70 billion bet that buying access to new reserves is quicker and easier than finding them itself. In particular, and what is of significance to us locally, is Shell's big bet on LNG going forward.

Table 1: Shell & BG Combined LNG Portfolio

2014	Shell	BG Group	COMBINED
Equity LNG Liquefaction Capacity (mtpa)	26	7	33
LNG Delivered Volumes (mtpa)	34	11	45
Regasification Terminals (#)	6*	4*	9



The Bet on LNG

Shell's relationship with LNG is a decades-old one. Actually, when global LNG trading began 50 years ago, it was Shell who delivered the world's first commercial shipment of LNG from Algeria to the UK aboard the Methane Princess on October 12, 1964. If anything, Shell is strategically cementing its position as the dominant international player in the global LNG business (liquefaction, transport and re-gasification) today and hence its acquisition of BG, whose gas business is much larger than its oil portfolio. In fact, BG has the rights to export the first sizable volumes of American LNG to foreign buyers through a long-term agreement with Cheniere's almost complete Sabine Pass LNG terminal in Louisiana.

At the time of Shell's announcement of its acquisition of Repsol's LNG assets in February 2013, Shell's VP for gas globally, claimed that the acquisition of Repsol's LNG assets in the Americas was important in order to strengthen Shell's position as the global leader in the LNG business.

Shell has consistently displayed confidence in our local LNG industry by firstly acquiring the LNG assets from Repsol via its sale of its Americas assets and now via acquisition of BG. While it can be argued that it was not an isolated event, the Atlantic assets no doubt, was a significant deciding factor and the recent visit by Shell CEO to Trinidad and Tobago is testament of the importance placed on the assets locally.

It is probably well known by now that the merger will combine the two largest investor-owned suppliers of LNG in the world. What is also probably well-known, is the fact that Shell will become the dominant player in the LNG game locally, with an estimated share equal to circa 52.97% of the output of Atlantic's 4-train LNG facility, with majority shareholding in Atlantic trains 2/3 and train 4 together with a 46% share in train 1.

Local Position – State Participation

The table below depicts host-government state energy companies involved in liquefaction projects within their own countries. Most countries where an LNG export facility is located seek to acquire a significant percentage share of the equity in their respective liquefaction projects. Qatar for example, (the largest exporter of LNG globally at 77 million tonnes per annum), via its state company Qatar Petroleum, maintains majority ownership across all LNG projects within its country.

While the US and Australia do not have state companies that participate in their respective LNG projects, the dominant players are companies whose majority shareholders are citizens and as such directly participate in their respective countries' natural gas export projects. Woodside Petroleum and BHP Billiton for example, are the two largest shareholders in Australia's existing LNG projects.

Table 2: Liquefaction Projects by Government Equity Share

Existing/Future Plants	State Company	Equity Share	Trains
Algeria	Sonatrach	100.00%	16
Libya	LNOC	100.00%	4
Abu Dhabi	ADNOC	70.00%	3
Qatar	Qatar Petroleum (QP)	68.00%	14
Malaysia	Petronas	67.50%	9
Oman	Government of Oman	58.50%	3
Brunei	Brunei Government	50.00%	5
Russia	Gazprom	50.00%	2
Nigeria	NNPC	49.00%	6
Indonesia	Pertamina	37.00%	18
Norway	Statoil	37.00%	1
Yemen	Yemen Gas	26.00%	2
Equatorial Guinea	Sonagas	25.00%	1
Angola	Sonangal	22.80%	1
Egypt	EGAS/ EGPC	22.00%	3
Papau New Guinea	Petromin PNG / IPBC	19.60%	2
Trinidad and Tobago	NGC	5.30%	4
Australia	None	0.00%	8
U.S.	None	0.00%	1
Peru	None	0.00%	1

It is clearly visible that among LNG exporters, Trinidad and Tobago's equity share of our LNG exports – at 5.3% average – is significantly lower than the global average of 40% and one of the lowest overall. Hence, while other countries ensure that they capture a meaningful share of the value that lies in the LNG trading business, Trinidad and Tobago because of our limited shareholding, receives a relatively small piece of the LNG pie.

Acknowledging that LNG is a very lucrative business, Shell's CEO, when quizzed on the acquisition, admitted that "LNG is a very important component of this," and that BG was at the top of a list of companies Shell was considering buying.

This acquisition is testament to Shell's long-term visioning and their pursuit of strategic goals through appropriate initiatives to achieve the vision. It also speaks to the agility of the company to readily adopt different approaches as opportunities arise.

Conclusion

In an article from the Oil and Gas Journal dated April 08, 2014, the Minister of Energy and Energy Affairs, Senator the Honourable Kevin Ramnarine is quoted as saying:- "We as a government have articulated the view publicly and to the companies that we would like to have a bigger stake in the marketing of LNG". Commenting on the initial draft of the Gas Master Plan that was submitted to the Ministry of Energy and Energy Affairs in April 2015, the Minister further noted one of the preliminary positions from the report:- "We need to have a second look at our LNG industry in Trinidad and Tobago and that there are opportunities for us to capture more value as a country from the natural gas that goes to LNG and from natural gas that goes to some other industries."

In moving forward, perhaps one area of focus can involve taking another look at opportunities along the LNG value chain (liquefaction, regasification, transportation, trading) and the inherent benefits that can be derived to aid in sustaining the continued development of our country.

References:

- Bloomberg News, "Shell Will Buy BG Group for \$70 Billion in Cash, Shares", <http://www.bloomberg.com>
- Forbes, "Shell's BG Deal: It's All about LNG and Pre-Salt Development" 9 April 2015, <http://www.forbes.com>
- International Group of Liquefied Natural Gas Importers: "The LNG Industry in 2014", <http://www.giignt.org>
- Royal Dutch Shell plc "Recommended Cash and Share Offer for BG Group plc by Royal Dutch Shell plc", <http://www.shell.com>
- Royal Dutch Shell Plc, "Investor Presentation - Recommended Combination with BG Group", April 2015
- Trinidad Express, "T&T's LNG industry needs a second look", <http://www.trinidadexpress.com>, 22nd April 2015
- Williams, Curtis, "Trinidad and Tobago signal BP, BG for larger stake in ALNG train" Oil and Gas Journal, April 8 2014.



The Establishment of a Greenfield Buffer Zone at Union Industrial Estate

By N. Victor

What is a Buffer Zone?

A Buffer Zone is an area surrounding a development, plant, or disturbed area of land, meant to attenuate any adverse effects emanating from the development, plant, or disturbed area to levels that are acceptable on its outer boundary. It may vary in width and vegetation, depending on the nature and extent of the adverse effect(s). It should not be accessible to the public, and should only be accessed for monitoring and maintenance work.

The designation of spaces for vegetative or “greenfield” buffer zones to separate sensitive areas from adverse environmental impacts is extensively used in land use planning globally. Buffer zones may serve a variety of functions such as the minimisation of soil erosion when established along the banks of watercourses, as well as the reduction of air and noise emissions.

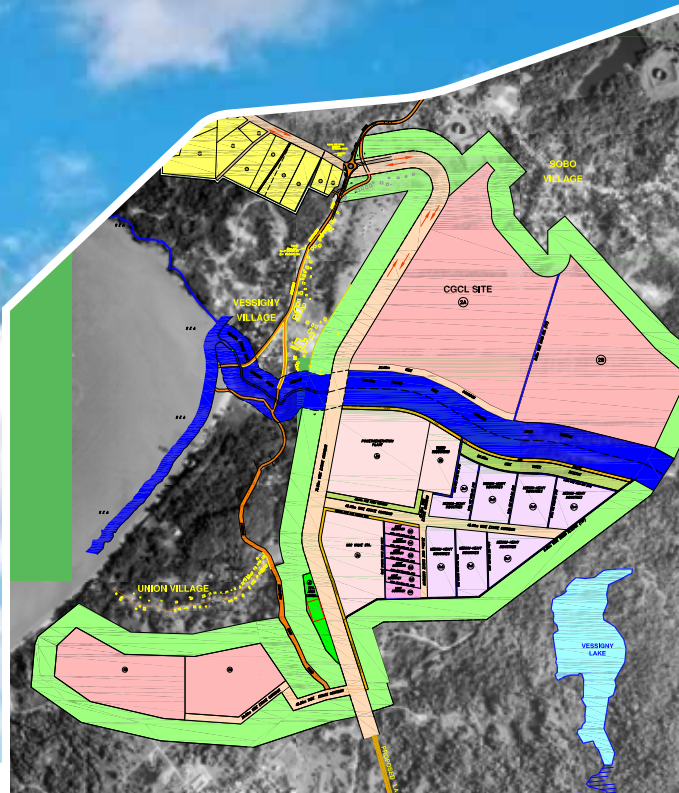
Greenfield buffer zones are also used in the agricultural sector to minimise the potential impact of soil erosion and odours arising from agricultural activities. In this instance, the trees planted in the buffer zone ameliorate odours by reducing wind speeds and physically intercepting dust and aerosols, thus acting as a sink for chemical constituents of odour.

The Greenfield Buffer Zone at UIE will be established with the objective of minimising, as far as is reasonably

Introduction

The National Gas Company of Trinidad and Tobago Limited (NGC) was granted a Certificate of Environmental Clearance (CEC) by the Environmental Management Authority (EMA) in compliance with the CEC Rules 2001 and the Designated Activities Order 2001 for the construction of the Union Industrial Estate (UIE) in La Brea. National Energy Corporation of Trinidad and Tobago Limited (National Energy) was subsequently mandated by its parent company, NGC, to manage the construction of UIE. One of the conditions of the CEC stipulated that a 100 metre wide perimeter buffer zone be established and maintained in a greenfield state, during the construction and operations phase of the project.

National Energy in its capacity as landlord of the estate has recognised the importance of ensuring its commitment to the sustainable growth of UIE. In this regard, the company is currently embarking upon a project to develop a perimeter Greenfield Buffer Zone at UIE.



Proposed Configuration of Union Industrial Estate Buffer Zone (shown in green)

practicable, the impacts of noise, particulate matter (dust), vapour emissions, light, heat and pressure, from any blast or explosion that may occur during the construction and operations phase on sensitive receptors located along the border of the estate. Sensitive receptors refer to both the ecological, as well as the built environment, such as the neighbouring schools, businesses and homes located within the fenceline communities of Vessigny Village, Sobo Village, Chin Fong Alley, Union Village, Vance River and Cochrane.

Buffer zones are intended to safeguard and protect sensitive ecological resources, human lives, property, comfort and well-being from fire and explosion, noise and vibration, air pollution, water pollution, odour and emissions. It should be noted however, that the existence of a buffer zone does not absolve industry from the need to employ their own strategies to reduce emission levels. Ideally, greenfield buffer zones act as a second line of defense in the event of equipment failure or other upset conditions.

How will it be established?

The approach for the establishment of the greenfield buffer zone will be executed in two main steps. The first step entails the “detailed design “of the buffer zone. During this stage, background studies are conducted on the soil and natural vegetation characteristics as well as meteorological conditions of the area. These studies aid in the identification and selection of suitable plant species for the establishment of a Greenfield buffer zone.

In addition to the selection of the appropriate plant species that are tolerable to the soil and meteorological conditions of the area, additional considerations are required for the design of the buffer zone. These include the configuration of the plantings as well as planting density. These aspects are necessary to ensure that the buffer zone is adequately designed for its intended purpose, as well as being able to withstand the potential threat of storm and hurricane force winds as well as fire. The second major step in the development of the buffer zone is the development of an Implementation Plan. This plan will be based on the design developed for the Buffer Zone. The Implementation Plan will outline procurement of planting material, tools, equipment and labour requirements for the duration of the project.

The area earmarked for the establishment of the UIE Buffer Zone comprises approximately 100 hectares. The implementation of the project will be undertaken in two phases each phase entailing the planting of 50 hectares. Each of the two phases of the project will be over a period of five (5) years. The first year will involve the planting of the trees, while years 2, 3, 4 and 5 of each phase of the project shall be dedicated to maintenance and fire protection activities of the entire Greenfield Buffer Zone.

Status

National Energy held several consultations within the community of La Brea and environs during October 2014. These meetings were held to introduce the project to the community as well as provide information on the necessary steps to becoming a pre-qualified contractor eligible to provide goods and services associated with the project.

National Energy has publicly invited proposals for qualified service providers for the Detailed Design and Establishment of the Greenfield buffer zone. The detailed design phase of the project is carded to start in the second quarter of 2015.

References :

Hall, D., Myers, N., & Margaris, M. (1985). *Economics of Ecosystems Management*. Dordrecht: Dr. W.Junk.

Malone, Bud. “Using Trees to Reduce Dust and Odour Emissions From Poultry Farms | Fact Sheets.” *Fact Sheets*. September 26, 2012. Accessed May 10, 2015. <http://extension.udel.edu/factsheet/using-trees-to-reduce-dust-and-odour-emissions-from-poultry-farms/>.

Washington Forest Protection Association. (n.d.). Retrieved May 26, 2015, from <http://www.wfpa.org/forests-and-fish-law/buffer-zones/>

WindbreakTrees.com. (n.d.). Retrieved May 25, 2015, from <http://www.windbreaktrees.com>



Solar House Update



By C. Mahabir

In the previous issue of the Pioneer, it was reported that as part of the Ministry of Energy and Energy Affairs' (MEEA) National Energy Communication Campaign, National Energy was given the mandate to establish a solar house in Trinidad and Tobago. This solar house is being developed as part of the MEEA's effort to create greater awareness of the design of solar and energy efficiency systems for households, and the benefits of such.

This house has been designed to meet the energy needs of an average household in Trinidad and Tobago. The main components will include solar panels, solar water heaters, and solar-powered fans and lighting. The 750 square foot, two-bedroom wooden house, consisting of

an open floor plan kitchen/living room area, with a small verandah, will also be fully furnished upon completion. In December 2014, National Energy executed a contract with GH Photovoltaic Installation Training Agency Inc., for the establishment of a solar house in Trinidad and Tobago. The project involves the design, construction, supply and installation, project management, and testing and commissioning of all solar components and energy efficient modules in the house. The project site is the University of Trinidad and Tobago's (UTT) Point Lisas Campus.

Construction of the solar house began in early April 2015 and is progressing well. It is expected that the house would be completed by mid-2015.

10 Questions with Khevan Joseph

In this issue of the Pioneer, we feature Mr. Khevan Joseph, who is currently the ICT technician at National Energy. Over the years, he has grown with the organisation and consistently participates in many company-wide initiatives and events. He is also a key member of the football team, T(H)UGS. Khevan was the recipient of National Energy's Individual of the Year Award 2014, under the company's Reward and Recognition Programme. Khevan shares some of his experiences and thoughts with the readers of the Pioneer.

Pioneer: How long have you been at National Energy?

Khevan: Almost five years.

Pioneer: Can you describe your current position?

Khevan: ICT technician. I am responsible for systems and network administration, for the main administration building, as well as the port facilities. I basically have to ensure that the network, server and PBX systems are always functioning well, so as to minimise downtime and inconvenience to staff. In addition to this, I provide general ICT assistance to employees throughout the organisation as required.

Pioneer: What are your hobbies?

Khevan: I enjoy football, cricket, going to the gym (sometimes four times per week), fishing and other physical and outdoor activities.

Pioneer: What do you like most about working at National Energy?

Khevan: Interacting with people at all levels in the organisation. My job offers opportunities to broaden my scope and experience in several areas related to ICT. I enjoy what I do, so it makes my tasks easier.

Pioneer: What ability/skill do you wish you had (that you don't already have)?

Khevan: The ability to say no.

Pioneer: What is a motto that you live by?

Khevan: Love everyone as I (Jesus) have loved you (commandment from God).



Khevan Joseph,
ICT Technician at National Energy

Pioneer: What is your pet peeve?

Khevan: Dishonest people.

Pioneer: What is something that most people do not know about you?

Khevan: I am a fishing enthusiast.

Pioneer: Who in your life has influenced you the most? How did they do so?

Khevan: Definitely my mother. She has guided me through everything in life. She is the cement that binds our family together. I will always maintain high regard for the values that she has instilled in me.

Pioneer: What five words best describe you?

Khevan: Funny, aggressive, shy, emotional, enthusiastic.

National Energy

CORPORATION OF TRINIDAD AND TOBAGO

Corner Rivulet and Factory Roads
Brechin Castle, Couva
Republic of Trinidad and Tobago, West Indies
T: (868) 679-1156; 1061; 1138; 2453 or 636-8471
F: (868) 636-2905

nationalenergy.tt