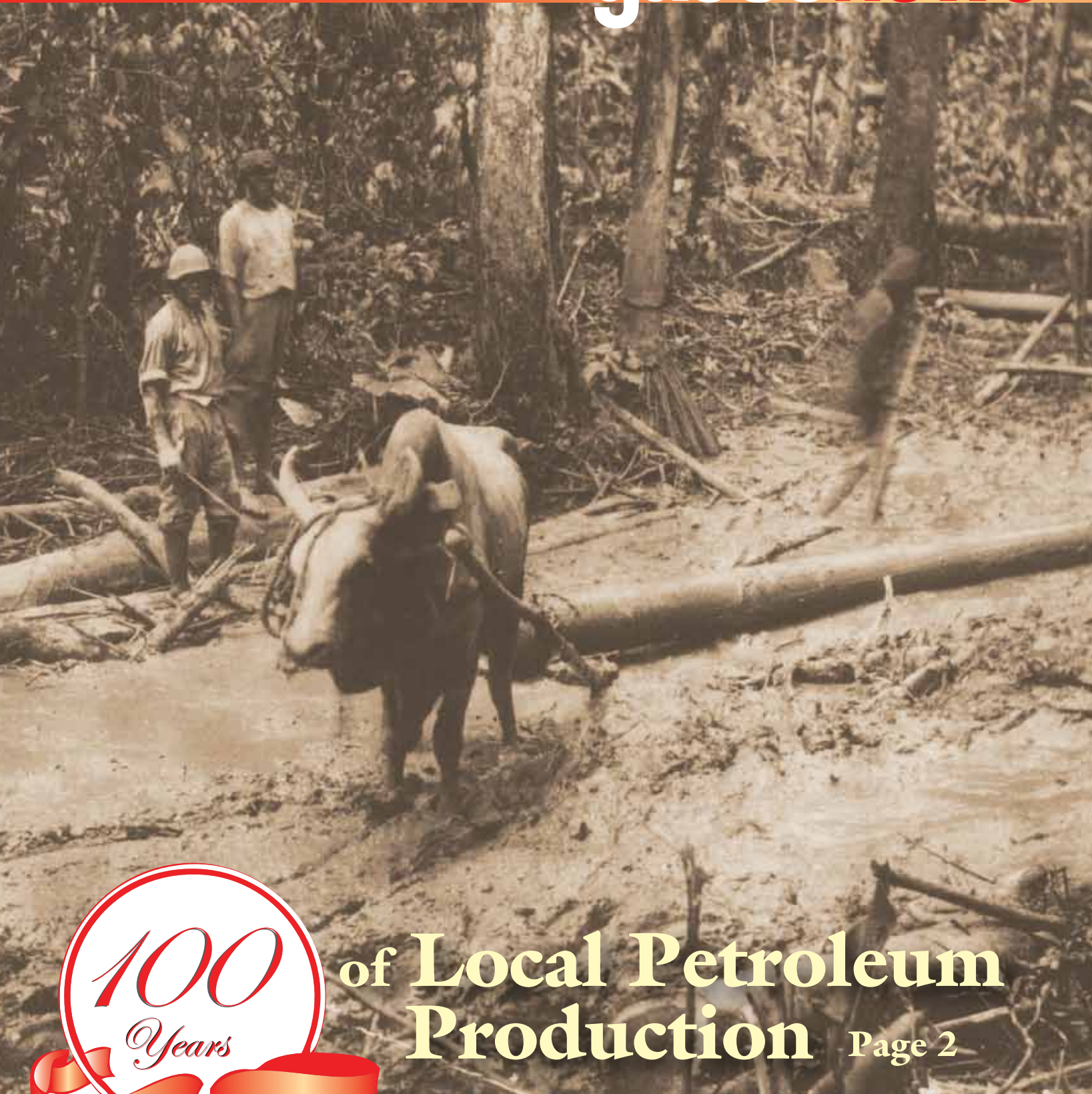


The Corporate Quarterly Journal of
The National Gas Company of
Trinidad and Tobago Limited

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 **gasco**news



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Fifty Years and Beyond **Page 7**

July 2009

The National Gas Company of
Trinidad and Tobago Limited (NGC)
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West Indies

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Front Cover: Clearing forest during
early drilling period.

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Brighton Port with Fabrication Yard in foreground.



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100 YEARS OF COMMERCIAL PETROLEUM PRODUCTION IN TRINIDAD AND TOBAGO

“With the world on the cusp of change, Trinidad and Tobago stands at an elevated crossroad, where opportunity meets possibility. For every step that has brought us this far, we owe an incalculable debt to the many pioneers, both sung and unsung.”

Senator the Hon. Conrad Enill, Minister of Energy and Energy Industries,
speaking at the Achievement Ceremony on May 22, 2009



Cross-section of Awardees at Achievement Ceremony.



Aerial view of Pointe-à-Pierre Oil Refinery – 1930s.

Trinidad and Tobago’s energy sector celebrated 100 years of petroleum production beginning in November 2008 with NGC initiating a series of two Knowledge Cafés designed to provide our nation with valuable information about the nation’s energy development over the period.

The first of the Knowledge Café events was held on November 1 in Point Fortin, the heartland of the oil industry, and close to the site where the first oil well was drilled in the world. Andrew Jupiter, President NEC and a past Permanent Secretary of the Ministry of Energy and Energy Industries, was the first feature speaker leading participants, many of them from Point Fortin, through the historical phases of energy development in Trinidad and Tobago.

He said that oil prospecting began in 1865 when Walter Darwent drilled his first well at San Fernando. While this first well was abandoned as a dry hole, subsequent attempts at Aripero from 1866 to 1877 proved relatively successful. On October 11, 1866 a five-inch tubing in rock at 100 feet and 20 feet of oil-bearing strata produced 2.5 barrels of oil in seven hours.

However, Darwent’s untimely death terminated this early phase of Trinidad’s oil history and it would be another 30 years before the prospect of oil finds would again gain momentum. Yet in this period of the late 1800s mineral usage was spurned with the increased usage of machinery in the developed world, in particular the invention of the motorcar which created the demand for gasoline.

A planter from Moruga, Randolph Rust, an Englishman, teamed with John Lee Lum, a shopkeeper from Guayaguayare and owner of land in the area, to drill a well in the vicinity of the older well drilled by Darwent. On testing the well in October 1901, 100 gallons of oil were produced in two hours. This was the beginning of a new age for the country.

Mr. Jupiter also reminded the audience of key historical dates. Between 1902 and 1907, nine wells were drilled, but the absence of pipelines mitigated further development. Rust’s drive to develop Trinidad’s oil brought the arrival of Engineer Thompson who surveyed oil and asphalt seepages for two months which led to the first commercial oil production from Guapo, La Brea, on the



Early refinery at Pointe-à-Pierre.



Early “adventurers” were driven to find oil for new market commodity - crude oil.

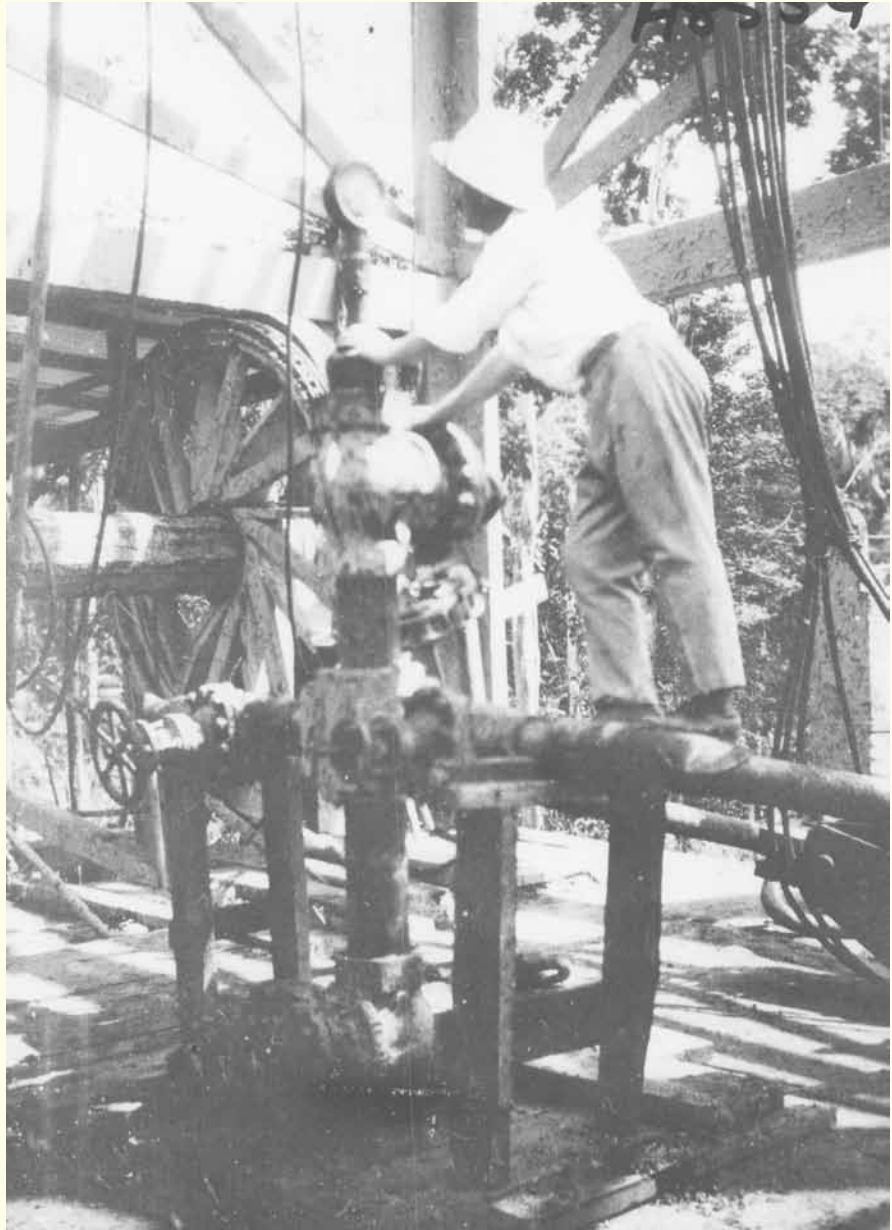
southwest coast, in 1908, making export of the first cargo of oil possible from Brighton.

Then followed a boom period which had less to do with increased oil production but with the finding of oil in British soil – Trinidad. There was reaction on the London Stock Exchange to the decision of the Lord of the Admiralty Winston Churchill to convert fuel for the Royal Navy from coal to oil – Trinidad’s oil. Other firsts mentioned by Mr. Jupiter included the commencement of operations of the largest 36-slot offshore platform off Brighton after World War II, and, by the late 1960s, the expansion of Texaco’s refinery at Pointe-à-Pierre, which was the largest oil production location in that company’s global operations.

The second Knowledge Café was held a fortnight later at the Hilton Trinidad in Port of Spain. Lead speaker Mr. Trevor Boopsingh, Chairman of the Association of Caribbean Energy Specialists and a former Permanent Secretary in the Energy Ministry, conveyed valuable information about petroleum pricing and the importance of energy projects to the economic development of Trinidad and Tobago. Guests at these talks benefited from the enlightening contributions of these two sons of the soil, who have given much of their lives to the energy sector.

In February, the South Trinidad Chamber of Industry and Commerce (STCIC) hosted its annual Trinidad and Tobago Petroleum Conference whose theme was Energy for Competitiveness. The agenda outlined lessons of history from the first 100 years of petroleum industry development and the initiatives that will inform the future of energy. In May, the STCIC hosted on behalf of the Ministry of Energy and Energy Industries and the Celebration Sponsors – NGC, Repsol, ALNG, BHP Billiton, BG and BP – an Achievement Ceremony held at the Hyatt Trinidad Regency Hotel in Port of Spain. On that occasion, 39 pioneers were celebrated and awarded for their contributions to the industry. It is to be noted that of the thirty-nine twelve were connected to NGC during their careers. A list of the persons receiving awards is provided on the following page.

First Magazine, a premier publishing house located in London, England, was commissioned by the Ministry of Energy and Energy Industries to produce a commemorative coffee table book to celebrate a century of commercial oil production in Trinidad and Tobago. Some of the articles highlighted in the book included energy milestones for the past 100 years, the Trinidad



Early drilling – many companies and estates got into the business of oil – 1914 a million barrels per year was being produced.

and Tobago economy, diversification, and the Trinidad and Tobago petroleum geology and prospects. The publication was distributed globally and formed part of the package given to the leaders attending the Summit of Americas held in Port of Spain in April 2009. The historic book will also be distributed at the Commonwealth

Heads of Government Conference in November 2009.

As a Celebration Sponsor, NGC also contributed to the creation of a mobile museum which toured schools throughout Trinidad and Tobago in May and June, and which will resume information-sharing when school reopens in September. Interestingly the

mobile museum includes a short play relating the story of the beginnings of oil production.

A more lasting artefact was created, however, with the opening of the historical Petroleum and Asphalt Museum in July at Petrotrin in Pointe-à-Pierre, which in the first phase will collect, preserve and display precious petroleum artefacts on local soil. Petrotrin donated the old historical Government Railway Station, which was extensively refurbished to fulfil its new role as the cornerstone of a planned state-of-the-art museum facility dedicated to the emergence of the petroleum industry in Trinidad and Tobago.

In related announcements in support of the dedication to knowledge-sharing and heightened awareness throughout 2009, the Ministry of Education announced that geography, geology and the history of the 100-year-old petroleum industry would now be studied in secondary schools in Trinidad and Tobago. As part of that initiative, the Geological Society of Trinidad and Tobago produced a geological map of the country, which identifies known gas deposits and the companies producing oil and gas locally. Two hundred copies of the map have been donated to schools as part of the education initiative.

A public education programme outlining the history of the local petroleum economy began in August in the local press and other media to bring greater awareness of this legacy and the local resources available.

Thus with greater awareness of what the petroleum industry has done for this country it will assist present and future generations understand the need for preservation of a legacy that started as a vision of a few and became a vision for many and an independent Trinidad and Tobago.

Awardees at the Achievement Ceremony

LEADERSHIP

1. Sen. Basharat Ali
2. Barry Barnes
3. Eugene Bertrand
4. Kenneth M. Birchwood
5. Charles Brash
6. J. Ian Hart
7. Walton F. James
8. Malcolm A. Jones
9. John Lee Lum*
10. Errol Mahabir
11. Robert Montano
12. Dr. Eric Eustace Williams*
13. Randolph Rust*

SPORT AND CULTURE

1. Charles Ahamad

EDUCATION, RESEARCH & TRAINING

1. Professor Kenneth S. Julien
2. David Renwick
3. Noel Wyatt

TECHNICAL AND PROFESSIONAL EXCELLENCE

1. Henry Fitzroy Harewood
2. John P. Andrews
3. Chiang Keith Awong
4. Kerston Coombs
5. Hasely Crawford
6. Frank Look Kin
7. Krishna Persad
8. Arthur Beeby Thompson*
9. Hans Kugler*
10. E.H. Cunningham Craig*

COMMUNITY AND LABOUR RELATIONS

1. Elbert Redvers Blades
2. Errol McLeod
3. George Weekes*
4. Tubal Uriah "Buzz" Butler*

INTERNATIONAL RELATIONS

1. Doddridge Alleyne
2. Kamla Bhoolai
3. Robert Riley
4. Bob Skinner
5. Kermit Walrond*
6. J.P. Schmalz*
7. Bernard Primus*
8. Augustus Long*

*Posthumous awardees

A public education programme outlining the history of the local petroleum economy began in August...

PETROCHEMICAL PRODUCTION IN TRINIDAD AND TOBAGO – FIFTY YEARS AND BEYOND

Trinidad and Tobago with just 1.3 million people can boast of having one of the oldest energy industries in the world. In 2008, we celebrated 100 years of commercial oil production with the first well being drilled in 1857 in the vicinity of the Pitch Lake in southwest Trinidad. In 2009 we celebrate 50 years of petrochemical production.

Birth of the Petrochemical Industry

It all started in 1959 when the American fertilizer company W.R. Grace constructed and commissioned the Federation Chemicals Limited (FedChem) plant to manufacture nitrogenous fertilizers utilizing natural gas. But why did W.R. Grace, a well-established fertilizer company, choose to come to these shores? Its presence can be linked to a developmental strategy of “industrialization by invitation” embarked upon by the then government to encourage and emphasize manufacturing. Three pieces of legislation, i.e., The Aid to Pioneer Industries Ordinance, The Income Tax Reform Ordinance to Benefit Industry and The Nitrogenous Fertilizer Industry (Development) Act 1958 were enacted to create an environment in which Foreign Direct Investment (FDI) would flourish and become the engine for economic development. These ordinances provided wide-ranging fiscal incentives by permitting new investment to benefit from accelerated depreciation allowance, duty-free importation of machinery and raw materials and repatriation of profits. These policies also led to the establishment of over 100 pioneer industries including brick manufacture, beer, textiles, glass, cement, paints and other chemicals.

Grace’s decision to locate its plant in Trinidad was also based on this



By MERLYN RENNIE-BROWNE
Team Leader, Business Development, NEC

country’s rich natural resources, namely, natural gas. Although gas deposits were discovered in the 1940s (at that time it was regarded as by-product with no value and used in the production of oil or flared), significant production did not get underway until the mid-1950s with the discovery of the Penal gas condensate field which served to supply the FedChem plant and to generate power. Trinidad’s location was also of strategic importance to Grace as it sought to profit from a growing demand worldwide and particularly in North America for nitrogenous fertilizers to boost agriculture.

The FedChem plant with a capacity of 250,000 tonnes per annum was built on 204 acres of land of what was once swamps and cane fields. At that time ammonia price was about US\$40¹ per tonne but it must be noted that the gas used to produce it was cheap with a wellhead price of around US0.13¢ per mmbtu².

Development of the Industry

By the early 1970s, the Government realized that its model of FDI did not result in the economic transformation as anticipated and this, combined with the Black Power Movement and the long-standing criticism by trade unions

of foreign ownership of the commanding heights of the economy, led the Government to reverse its earlier strategy and become more involved in the industry. This reversal, however, was not aimed at getting rid of FDI altogether, but at reserving certain areas of the economy for national effort and ensuring that key sectors were not dominated by 100% foreign ownership and control.³

Arising out of this change in strategy, the Government in June 1974 established the Trinidad Nitrogen Company Limited (TRINGEN) to enter into a partnership with W.R. Grace to produce ammonia. This heralded the Government’s involvement in the petrochemical sector, in this instance as a shareholder. The Tringen 1 ammonia plant, at a cost of US\$111.4 million and with Government ownership of 51% and W.R. Grace 49%, was commissioned on November 29, 1977. Its capacity at the time was 360,000 metric tonnes/year and it employed 90 persons.

But even before Government’s involvement in the petrochemical industry, certain events, the results of which later proved to be significant, coincided with the Government’s thrust into the energy sector. Borne out of the frustration of having their merchandise unloaded at the deepwater harbour in Port of Spain then transported to San Fernando which took longer and cost more, San Fernando merchants around 1939 came up with the idea of a deepwater harbour which would attract shipping to the area of San Fernando just as in Port of Spain.

The idea did not gain momentum until mid-1950 when the South Trinidad Chamber of Commerce was formed and investigated the possibility of a deep-water harbour. The results of this early feasibility study were disappointing as it

was determined that the project would be very difficult to justify and finance. The Chamber, not wanting to give up on its idea, directed its thoughts to a more ambitious project, one which the group felt would benefit not only the local importers but would be aligned with the Government's industrialization plans. The Chamber argued that with Government's intention to attract investors with incentives and low-cost energy there would be a need for an industrial port, as these investors would most likely produce commodity feedstock for export. The evidence of the need for a port was already there as the two industries existing at that time, i.e. FedChem and the cement plant, both had to build their own ports. The Chamber concluded that "the absence of port facilities would be a powerful deterrent to the investment the Government was chasing."⁴

By 1965 the Government saw merit in the Chamber's thinking and agreed to fund a more detailed study to be conducted by Arthur D. Little as recommended by the Chamber. Little's report, submitted in mid-1966, concluded that a deepwater harbour/ industrial port and industrial estate were economically viable and technically sound, and identified Point Lisas as the most feasible location for such ventures. The Chamber, encouraged by the report and eager to take the project forward, formed the Point Lisas Industrial Port Development Corporation (PLIPDECO) as the vehicle to drive the project. PLIPDECO was registered on September 16, 1966 with the Chamber having controlling interest but with the Government via the Industrial Development Corporation (IDC) owning shares (as exchange for funding the study) and gaining a seat on the board.

The PLIPDECO Board then sought to develop a master plan for the Point Lisas area and engaged two consultants to undertake detailed engineering

With substantial oil revenues and with the production of natural gas doubled since the early 1950s, the Government grappled with the question of how best to utilize the country's gas reserves...

studies to identify likely industries and the requirements for the site. The industries envisaged then were oil processing/refining, steel production, petrochemicals and light manufacturing. PLIPDECO officials approached many foreign investors and although they got many encouraging responses, no firm commitments were received.

Disappointed and frustrated by its inability to attract clients and funding for its project, and by a flaw in its reclamation licence with the Government, which placed severe limitations on disposal of reclaimed land, the Chamber decided to "throw in the towel"⁵ and relinquished control of PLIPDECO to the Government. After a gradual acquisition of shares starting in 1971, the Government in late 1976 took full control of PLIPDECO. That take-over was a fundamental initiative in the Government's overall strategy of taking the lead role in development of Point Lisas and the petrochemical industry.

Government as Developer

The Seventies was the turning point for the gas-based energy industry in Trinidad. By that time the Government was convinced that it needed to have a deeper involvement in the industry and this was fuelled by two major events:

1. Significant gas finds firstly by Amoco in 1968 off Trinidad's south-east coast followed by discoveries in the L-Block, also off the south-east coast, by a consortium comprised of Trintoc, Texaco and Trinidad

Tesoro. More finds were announced by a consortium of Deminex, Agip, Tenneco and Occidental in the north coast and by Texaco in Block 1 in the Gulf of Paria.

2. Unprecedented increases in oil price from 1973-74 coupled with significant oil discoveries along the east coast.

With substantial oil revenues and with the production of natural gas doubled since the early 1950s, the Government grappled with the question of how best to utilize the country's gas reserves. A proposal by Amoco to construct an LNG plant at Galeota was rejected by the Government, after about two years of discussions and planning. This was based on a recommendation from the then Energy Secretariat that LNG was not in the best interest of the country at the time and that the natural gas would be best used as a catalyst for the Government's industrialization thrust. At a national conference on the best uses of the energy resources convened by the Government in early 1975, industries were identified for the State to target – petrochemicals (ammonia, methanol, acetylene), LNG, steel, aluminium and furfural (a solvent used in the production of base lubricating oil in the refinery).

The selection criteria developed for the industries included capital costs, job creation, linkages, import substitution, export potential, foreign exchange earnings, diversification, return on investment, new technology

and environmental risks⁶ – no different from today’s selection process. At that time world demand for ammonia and methanol was growing steadily, and carbon dioxide, a by-product in the ammonia process, could be used to produce urea, another nitrogenous fertilizer also in great demand. The initial evaluation stage yielded steel and petrochemicals as the best options for the gas-based industry.

The question then arose as to the location of the selected plants. Several sites were looked at but it was felt that a single estate which could accommodate many industries and provide access to a deepwater port for export would be ideal. The Point Lisas estate was unmistakably the ideal location and so the puzzle was now complete for the formation of a gas-based energy industry.

The focus then became the development of the estate and the industries that would occupy it. In September 1975 the Government formed a Coordinating Task Force comprised of a small core group of local technocrats from the University and Ministry of Energy with support from the Industrial Development Corporation (IDC) and other state entities. The mandate of the Task Force was to undertake the planning, design and development of the estate and to provide the infrastructure to support heavy industries. The group was also asked to again identify and evaluate industries for the Government to pursue.

The Task Force had a daunting task but was committed and worked tirelessly. As one of its members described the atmosphere, “there was a strong, almost obsessive desire to get the energy sector going and there was a sort of missionary zeal to get the work done.”⁷ Finally, the decision was to establish an iron and steel plant which was intended to be the foundation upon which the Government’s initiatives into heavy industry would be realized, through the establishment of several downstream

facilities producing steel products. The State, based on the belief that demand for fertilizers in the Caribbean region would grow, decided to construct two ammonia plants, one a joint venture with Amoco (Fertrin) and the other the joint venture with FedChem (Tringen 1).

The desire to go further downstream and maximize on its investment led the Government to pursue a urea-producing facility which would utilize the ammonia and carbon dioxide from the ammonia plants. A methanol-producing facility and expansion of the cement plant were also selected for in-depth study. Aluminium was dropped because of years of poor market conditions, and so too was furfural.

By 1978, a mere three years after the formation of the Task Force, the 1,000-hectare Point Lisas estate was transformed. Construction had started on the steel mill. There was financing for the ammonia plant. Fertrin was complete. Tringen 1 was in production and the power station was already generating 128MW. PLIPDECO had played a vital role alongside the Task Force in developing the estate and its services and by 1979 the major infrastructural work was well advanced. In May of that year the port was completed at a cost of TT\$24 million.⁸ These accomplishments were indeed amazing feats for a young country, more so a new entrant into the gas-based petrochemical industry.

Birth of the National Gas Company and National Energy Corporation

To cement its leadership role and effectively control the development of the gas-based petrochemical industry, Government in August 1975 established the National Gas Company of Trinidad and Tobago Limited (NGC) as the sole purchaser, seller and transporter of gas. The effect of this was that the State would now be able to negotiate long-term contracts with the gas producers, which it could then use to attract

investors to the new estate.⁹ NGC established a pipeline network with a 400 MMscf/d 24-inch offshore and land pipeline system to route gas from the offshore Teak gas field to Point Lisas.

In 1984, the company laid a 30-inch submarine line to transport gas from the offshore production field of Cassia to Abyssinia, Guayaguayare with another 30-inch cross-country segment to Point Lisas. The design capacity of this network is 600 MMscf/d. NGC has since laid down 760 km of pipeline with a total capacity of 4 bcf/d and its 56-inch Cross-Island Pipeline (CIP) holds the record for the largest diameter line in this hemisphere.

In 1979, the Task Force was disbanded and National Energy Corporation (NEC) took over the project development work. NEC was originally conceived as a holding company for Government interests in the various companies as the State had decided to take equity or in some cases sole ownership of the companies but this was not put into effect. However, the company was also charged with project development and management and was involved in the commissioning and startup of the methanol and urea plants.

The Early Years of the Point Lisas Estate and the Petrochemical Industry (1984-1993)

By 1985 the estate was the home to four operating petrochemical plants. The other plant, Tringen 1, was sited within the FedChem compound. Table I on page 10 provides a list of companies.

Unfortunately, the early years of the plants were fraught with problems. Full production at Fertrin 1 plant was not achieved until nearly a year after startup while the startup of the #2 unit was delayed due to operational problems. The urea plant was shut down not long after startup because of contractual issues between NEC, managers of TTUC and Fertrin, the contract operator. The

full year of urea production occurred in 1985 but the plant only operated at 60%¹⁰ of capacity. There was an improvement in 1986 to about 76% with the production of 440,000 tonnes, but in 1987 the European Economic Community (EEC) accused Trinidad and Tobago of dumping urea on the West European market and as a result Trinidad agreed to limit its sales to Europe.¹¹

Notwithstanding the early hiccups, by 1991 these plants were running close to full capacity with ammonia and urea production at 1.93 million and 525,000 tonnes respectively. However, as the plants were overcoming their initial teething problems, commodity prices of ammonia and urea, as a direct result of declining oil prices, fell drastically from a high of US\$180/mt in 1984 to US\$105/mt in 1986, way below the forecasted price of about US\$235/mt¹² (used in the planning stages). Refer to Figure IV. The low prices resulted

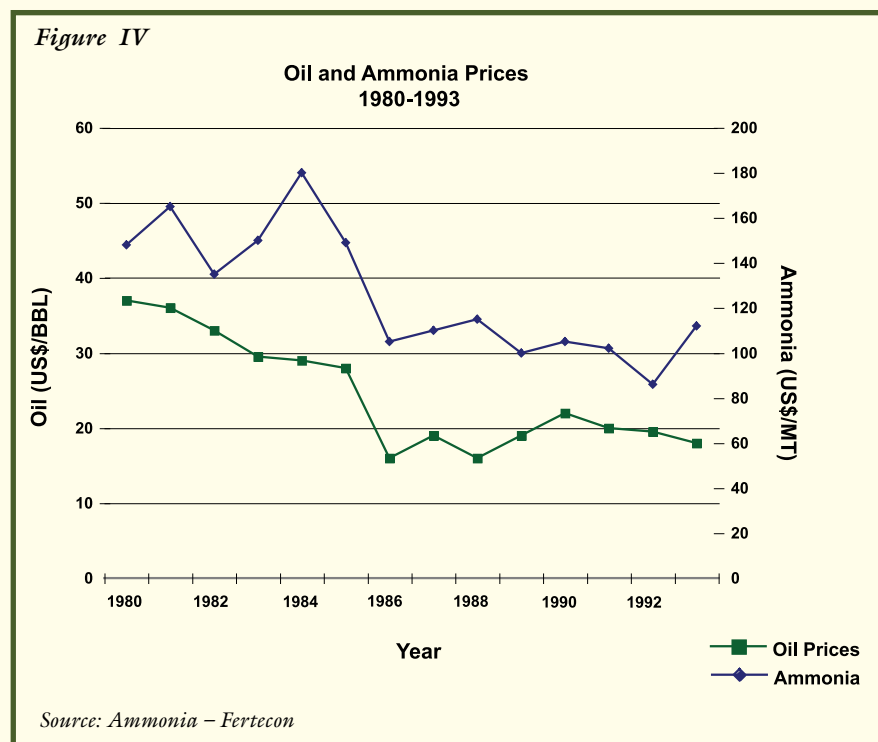


Table I – Companies in the Natural Gas Industry (1985)

Company	Ownership Status	Startup Year	Cost (MMUS\$)	Management Arrangement	Permanent Employment	Nameplate Capacity (tpa)
The Iron & Steel Company of T&T (ISCOTT)	100% GORTT	1981*	500*	Locally managed	1200	450,000 DRI 700,000 Billet 600,000 wire rods
TRINGEN 1	51% GORTT 49% W.R. Grace	1977	111.4	Management and marketing contract with W.R. Grace	90	360,000
Fertilizers of Trinidad and Tobago (FERTRIN 1&2)	51% GORTT 49% Amoco	1982	350	Management and marketing contract with Amoco	270	690,000
Trinidad and Tobago Methanol Company (TTMC)	100% GORTT	1984	179.2	Management contract with NEC	190	455,000
Trinidad and Tobago Urea Company (TTUC)	100% GORTT	1984	117.1	Managed by NEC with operations contracts with Fertrin. Marketing contract with Agrico Chemicals	N/A	535,000

Source: Barclay, 2003 and The Pt. Lisas Story
*Hatch Engineering Company website. Hatch provided EPC and construction.

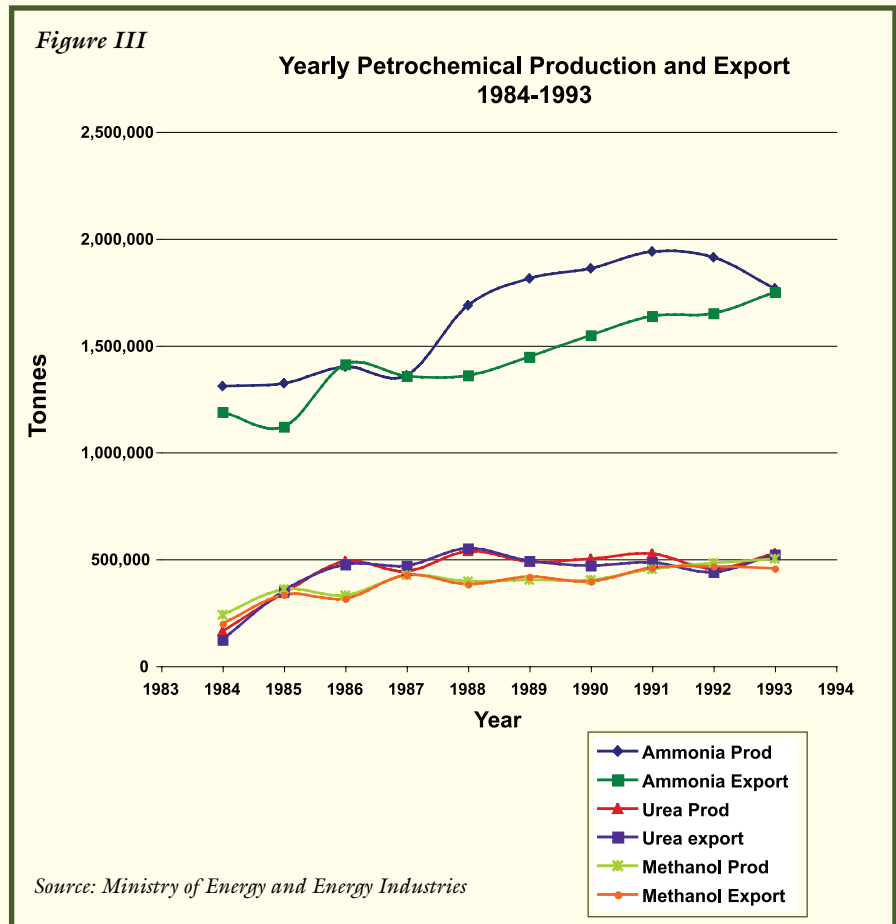
in severe financial losses, particularly for Fertrin and TTUC, as these new companies were also faced with high interest expenses. Although TTMC fared better by turning a profit in its first full year of operation, continued profitability was dependent on the global methanol market, which in turn was influenced by the oil prices about which there was much uncertainty. This crisis in the global energy industry had significant implications for the future of the local petrochemical industry and Government's continued participation in it.

Figure III gives the average annual production of ammonia and urea in the first ten years.

100 Years of Oil production

Of all the plants located in Pt. Lisas, it was the Iron and Steel Company of T&T (ISCOTT) that was most afflicted with management problems, which resulted in technical inefficiencies, poor maintenance of machinery and equipment, low steel production levels and huge financial losses. The company's marketing woes were exacerbated in 1983 when five United States steel companies filed an anti-dumping suit against it citing the Trinidad Government's deep involvement in the company and the subsidizing of the industry with the provision of cheap natural gas.

After paying countervailing and anti-dumping duties for several years, the Government, in 1987, signed a voluntary export restraint agreement with the United States to limit steel exports to 73,000 tons per year for a three-year period¹³. With low and declining production and heavy financial losses (it was rumoured at the time that the company was losing about US\$1MM per day and was referred to by many as a white elephant), the Government engaged a German steel firm to manage the company under a two-year contract. Production did increase, which signalled some success with the outside



management arrangement but the increases were not sustained.

By mid-1980s, the country had entered into a deep recession caused by the collapse of the international oil prices and a decline in domestic oil production. This led to severe reduction in Government revenues and its inability to continue supporting the State enterprises. The Government was now faced with the task of reversing the recession, reducing budget deficits and stabilizing the economy. A number of stabilization and structural adjustment programmes were implemented. The underlying policies of some were in stark contrast to previous economic policies; for example, the State no longer viewed itself as the prime mover in the energy sector but rather as policy-maker,

regulator and facilitator, and in his 1987 budget speech the then Prime Minister warned of the possible divestment of some State-run enterprises.

In 1989, the State began the process of divestment of its assets in the natural gas-based energy sector. The first step was the merging of NEC with NGC in 1991. With this merger NGC's mandate was expanded to include the promotion of new gas-based industries. In 1993, the Government sold the urea company and its 51% ownership in Fertrin to Arcadian Partners LP of the USA. Five years later in 1996, Arcadian was acquired by Canadian firm Potash Corporation of Saskatchewan (PCS). Conversely, ISCOTT, initially leased in 1989 for 10 years, was later sold to Caribbean ISPAT, a subsidiary of ISPAT Group owned by

the Mittal family of India. The company is now owned by ArcelorMittal.

In 1991, Hydro Agri, a subsidiary of Norsk Hydro, a Norwegian company and a world leader in the manufacture and sales of fertilizers, acquired W.R. Grace's shareholding in the Tringen I plant and FedChem. A year later the company purchased Tringen 2. The Government partially divested its shareholding in TTMC in 1994 to the German companies Ferrostaal AG and Helm AG and this resulted in a 69% GORTT, 31% Ferrostaal/Helm ownership structure. Then in 1997 the State sold its remaining shares in TTMC (which by then had built a second methanol plant in 1966) to a local company, Methanol Holdings Trinidad, owned by local insurance giant CLICO.

A hallmark of the Government's divestment policy was that for the first time the local private sector, notwithstanding its original cynicism, recognized the importance and potential of the energy sector and decided to participate in a meaningful way in its development. It was in this context that CLICO Energy was born in 1989 with the goal of establishing and managing new projects in the energy sector.

1994 – Present

With full divestment of its assets in the petrochemical industry, the Government continued its role of facilitator and regulator at Point Lisas while the task of further development of the industry was left up to the private sector. Today there are more than 20 gas-based petrochemical and metals plants representing over US\$10 billion¹⁴ in investments. (Refer to Table II).

Ammonia production from 1994 to 2007 averaged 3.5 million tons per annum with a high in 2001 of 5.2 million tons and a 2007 production of 5.11 million tons. Ammonia exports for the period followed a similar pattern with an average of 3.2 million tons per year,

Table II

Petrochemicals and Metals Companies – 2008

Product	Company Plant	Start-up Year	Original Ownership	Current Ownership	Capacity Mt/year
Ammonia	Yara Trinidad	1956	W.R. Grace	Yara Trinidad	250,000
	Tringen I	1977	51% Gortt 49% Grace	51% NEL 49% Yara	500,000
	Tringen II	1988	51% Gortt 49% Grace	51% NEL 49% Yara	454,000
PCS	PCS I	1981	51% Gortt 49% Amoco	100% PCS	454,000
	PCS II	1982	51% Gortt 49% Amoco	100% PCS	454,000
	PCS III	1996	100% PCS	100%PCS	250,000
	PCS IV	1998	100%PCS	100%PCS	600,000
Pt. Lisas Nitrogen		1998	50% Miss chem. 50% Koch	50% Koch Min. 50% Terra	600,000
Caribbean Nitrogen	CNC1/2	2002/ 2004	CLICO Ferrostaal KBR/EOG	CLICO Ferrostaal KBR/EOG	660,000 (each)
Urea Methanol	PCS TTMC1/2	1983 1984/ 1996	100% Gortt 100% Gortt	100% PCS MHTL/ Ferrostaal/ Helm	535,000 455,000 550,000
		CMC	1993	MHTL/ Ferrostaal	MHTL Ferrostaal
	Methanol IV	1998	MHTI/ Ferrostaal	MHTL	550,000
	M5 Plant	2005	MHTL	MHTL	1,650,000
	Methanex Titan	2000	Amoco Beacon Energy	100% Methanex	860,000
Atlas	2004	Methanex	Methanex	1,650,000	
Iron & Steel	Arcelor Mittal Ispat Caribbean	1981	100% Gortt (ISCOTT)	100% Arcelor Mittal	900,000 DRI 700,000 Billets 600,000 rods
		Nu Iron	1995	100% Nucor	100% Nu Iron
Nat. Gas Liquids	PPGPL	1991	NGC/ Conoco Pan West	NGC Conoco	1.35 Bn cu. ft/day gas

Source: Ministry of Energy and Energy Industries and www.yara.com

peaking in 2007 with 4.9 million tons. In the case of methanol, production averaged 2.82 million tons per year, achieving its highest in 2006 with 6.0 million tons.

Because almost all methanol is exported, records showed that the 14-year period averaged 2.8 million per annum with a maximum of 6.0 million in 2007. The urea plant also performed well during this period with an average production rate of almost 1.14 times its nameplate capacity of 530,000 metric tons. Today Trinidad and Tobago rightly boasts of being the world's number one exporter of ammonia and methanol from a single site. Trinidad and Tobago was also the first to have the largest rated capacity methanol plant of 5000mt/day.

In addition to record-high production levels, product prices also soared during the 1994 to 2007 period with average prices for all the commodities exceeding US\$100/mt and skyrocketing in 2007. (Refer to Figures V and VI below.) This combination of these events allowed the companies to rebound and mitigate the losses suffered between 1984 and 1993.

Today Trinidad and Tobago rightly boasts of being the world's number one exporter of ammonia and methanol from a single site...

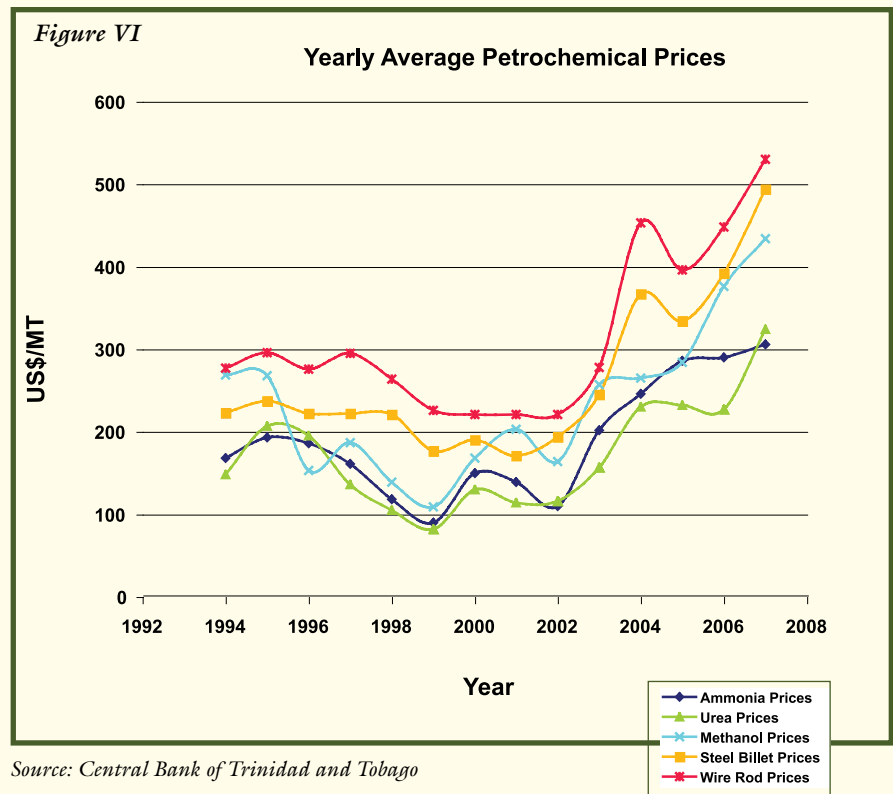
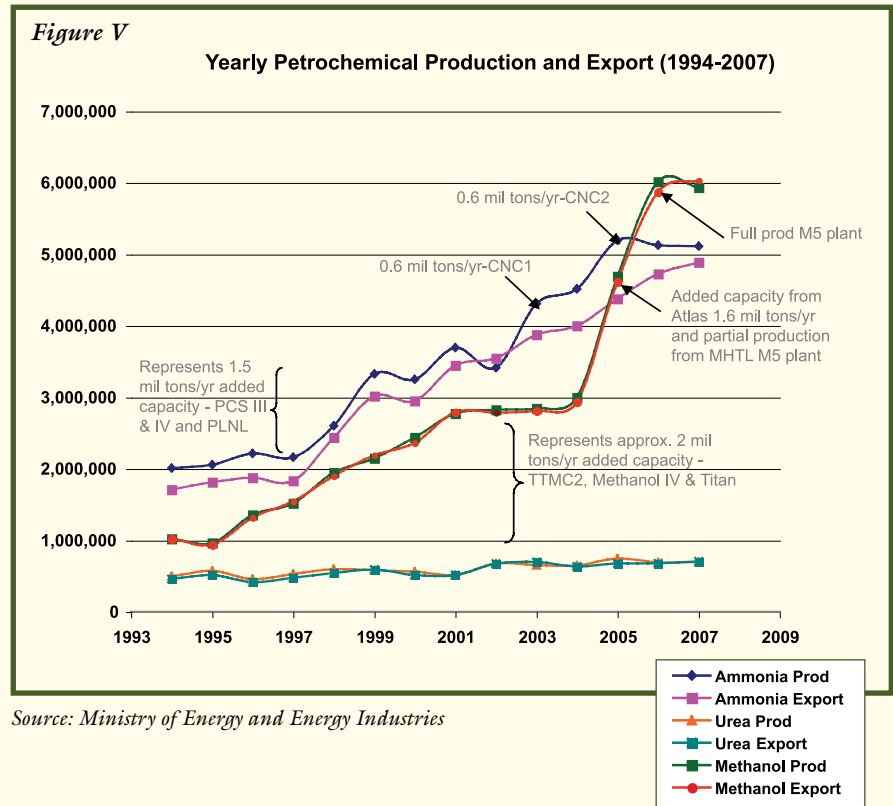


Table III – Economic Indicators

	2000	2002	2004	2006	2007
GDP at current prices (TT\$bn)	51.4	59.5	82.8	120.6	132.1
Energy Sector share of GDP (%)	31.3	28.3	39.0	46.8	43.0
Petrochemical share (%)	4.3	3.3	6.2	7.3	6.9
Petrochemical share (TT\$bn)	2.21	1.96	5.14	8.80	9.11
Energy Sector share of Foreign Exchange earnings (%)	81.2	75.9	85.8	91.0	86.7
Petrochemical share of Foreign Exchange earnings (%)	17.3	16.5	16.6	16.2	20.6

Source: Central Bank of Trinidad and Tobago

Contribution to the National Economy

The energy sector is the single main driver of the domestic economy and the natural gas-based petrochemical industry has become an important segment of the sector. Between the years 2000 and 2007, the energy sector’s contribution to Gross Domestic Product (GDP) averaged 37% with petrochemicals accounting for 6%. The contribution of petrochemicals may in fact be greater, given spinoffs from the industry. Refer to Table III for detailed impact on the economy.

Benefits

The growth in the petrochemical industry has added value not only to the Treasury but in other areas in the development of the country. We have seen the impact of that growth in the following areas:

1. Increased activity in the upstream business resulting from an increase in demand for gas. This has also led to a growth in 3P gas reserves from 29.51 Tcf in 2000 to 37.1 Tcf in 2007. Table IV demonstrates the growth in gas utilization for the petrochemicals and metals industries.
2. The acquisition by locals of knowledge and skills in the fields of project management, estate development and management, gas pricing, plant operations and maintenance. In fact, the top

Table IV – Gas Utilization by Industry (MMscf/d)

Industry	1990	2000	2005	2007
Petrochemicals	255	600	950	1,098
Iron and Steel	26	59	89	112

Source: Ministry of Energy and Energy Industries

- managerial positions in almost all of the companies in the industry are held by locals.
3. The evolution of the term “contract manufacturer” companies that undertake the operational function required to manufacture a product on behalf of the principal companies for a service fee. These companies have been able to expand into the international arena.
 4. The formation of joint ventures between foreign Project Management Consultants/EPC contractors with local engineering firms.
 5. The sharing of our expertise and wealth of experience with other countries in the development of their petroleum and petrochemical industries. The Prime Minister made such an offer at the 8th Ordinary Session of the African Union Conference of Heads of State of African countries. Arising out of this initiative, nationals from Equatorial Guinea have received training at the University of Trinidad and Tobago and during a recent

The energy sector is the single main driver of the domestic economy and the natural gas-based petrochemical industry has become an important segment of the sector

visit of Ministers of Energy from 12 African nations to Trinidad, a Memorandum of Understanding was signed on May 12, 2009, between The South Chamber of Industry and Commerce and the Nigerian Port Harcourt Chamber of Commerce, Industry, Mines and Agriculture for the exchange of information on best practices in the energy industry, oil and gas exploration services, design and construction of production platforms, reservoir engineering, pipeline design and construction and plant operations and maintenance.¹⁵

The Future

The State embarked on another phase of development of the petrochemical industry and, in 2004, NEC was again given the mandate to identify and promote new gas-based industries, in addition to its role as developer and manager of industrial estates and port and marine facilities. The intent of the Government was to go further downstream the gas value chain beyond the primary derivatives of ammonia and methanol and to facilitate the advancement of spin-off and end product industries from the new projects. Some projects have already begun construction and are at first-stage production while others are still in the developmental stages. See Table V at right.

The infrastructural projects include Pt. Lisas South and East Industrial Estate and Port, Union Industrial Estate, La Brea Industrial Estate and Port, Cap-de-Ville/Chatham and Oropouche Bank reclamation.

Conclusion

The petrochemical industry has played and will continue to play a crucial role in the overall development of the country. However, as we go forward in charting the future of the industry, efforts must be made for the country to realize the maximum value from its assets by ensuring that nationals (individuals and companies) benefit at all stages of the development of the projects and from all parts of the value chain. Although there has been some advancement in local value capture over the years, evidenced by the skills gained by nationals as mentioned previously, there is room for further progress in the areas of:

- plant engineering design, upgrade and troubleshooting
- Leading HAZOP studies
- Research and development capability
- Project management and EPC services

Table V – Project Under Development/Construction

Project	Constr. start date	Capex US\$MM	Perm. employment	Products	Quantity (tpy)
MHTL AUM	Q2 2006 ¹	700	300	Melamine UAN	60,000 1,400,000
Alutrint Smelter	TBD ²	800	1,050	Aluminium & downstream	120,000
Essar Steel	2010	1,700	1,225	HRC	2,500,000
Carisal Calcium Chloride	Q4 2009 ³	240	75	Calcium chloride Caustic Soda	120,000 85,000
Gas to polypropylene	Q4 2010	2,500	500	PP Gasoline LPG	470,000 180,000 36,000
Isegen Maleic Anhydride	Q1 2010	135	40	Maleic Anhydride and food acids	23,000

Notes: 1.The first stage of AUM, i.e., ammonia production facilities, has been completed and began operations in April 2009 2.TBD – To be determined. Construction works of the associated TGU power plant and temporary EPC contractor work camp have started. 3. Carisal has received a Certificate of Environmental Clearance.

- Product marketing strategies and logistics
- Financing

The Trinidad and Tobago Energy Sector Local Content and Local Participation Policy Framework addresses this issue and can be used as a guide in building the capability for increased value capture.

We owe a debt of gratitude to the pioneers of the industry and to those persons we must say thank you for blazing the trail.

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BACK TO REALITY: TRINIDAD AND TOBAGO'S EXPORT COMMODITY PRICE EVOLUTION

Trinidad and Tobago has traditionally been dependent on export-oriented production from an enclave sector to provide the impetus for economic growth. Since the establishment of fertilizer, methanol, LNG and iron and steel plants, developments in these markets have had significant implications for Trinidad and Tobago's economic fortunes. Over the past few years commodity prices have first trended upwards and then steeply downwards between September 2008 and the present. Given the reality that Trinidad and Tobago's economic fortunes will be heavily dependent on the state of these markets for the foreseeable future, an examination of current market trends in the natural gas, ammonia, methanol and iron and steel market is useful for forecasting the impact on the economy and the national policy strategic response.

First, some history. The diversification of the economy away from oil was one of the main reasons behind the construction of the Point Lisas Industrial Estate. Having suffered the negative effects of overdependence on one commodity in the past (sugar, cocoa, coffee, oil), the planners at the time sought to spread risk away from

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The diversification of the economy away from oil was one of the main reasons behind the construction of the Point Lisas Industrial Estate

the peaking oil sector to gas-based commodities. Since the establishment of the ammonia and methanol plants in the 1980s and 1990s and more significantly, since the startup of LNG production in 1999, performance of the Trinidad and Tobago economy has been based largely on growth in the energy sector – more specifically, growth in the natural gas sector. However, while the influence of natural gas on the economic fortunes of Trinidad and Tobago surpassed that of oil in the early years of the current decade, available data do not permit a disaggregation of the economic

contribution of gas from that of the energy sector total. As a result, the net benefit to the local economy arising from natural gas has to be inferred.

Table 1 summarizes selected economic indicators in Trinidad and Tobago from 1995 to 2008, while Table 2 shows the impact of the energy sector on selected economic indicators from 1995 to 2008. The data show that while the addition of LNG and ammonia and methanol plants have contributed greatly to an improvement in the level of economic growth (especially after 2002), it may have come at the price of even greater dependence on the fortunes of commodities in the “enclave” oil and gas sector. While this is not normally a significant issue, the rapid and synchronized fall in the price of all commodities in the second semester of 2008 following on the global financial and economic crisis meant that Trinidad and Tobago suffered from serious declines in the fortunes of all their commodities at the same time. Interestingly, while in absolute terms there is still more income being generated than in similar crises in the past (1986, 1998), the additional expenditure obligations arising out

Table 1
Selected Economic Indicators

	1995	2000	2003	2004	2005	2006	2007	2008
Real GDP growth (%)	3.2	7.25	14.40	7.80	6.10	12.20	5.50	3.50
Government revenue (TT\$Mn)	2554.7	4403.6	6904.6	8159.3	15851.8	21111.5	19365.9	24331.8
Exports (US \$Mn)	2411.5	3900.2	5204.9	6349.1	9663.1	12100.2	13391.3	8464.5
Unemployment rate (%)	17.17	12.17	10.47	8.37	7.97	6.22	5.54	4.87

Source: Central Bank of Trinidad and Tobago

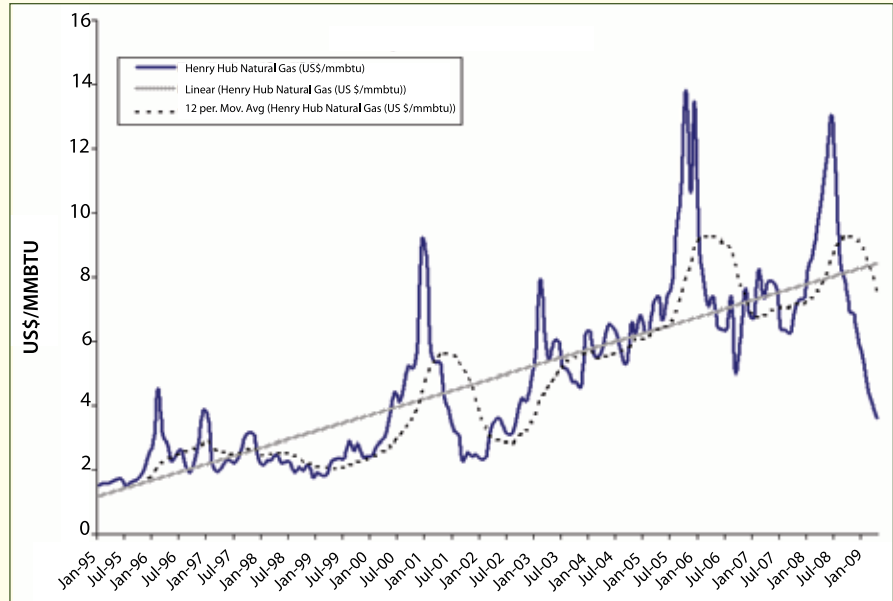
of increased social and infrastructural programmes means that the impact is potentially the same.

With respect to the selected commodities and their price falls, one school of thought states that while the prices have declined precipitously from the highs of early 2008, they are simply trending at their long-term average. One simple test that can be done to check the validity of this hypothesis is to compare the current price level with its long-term price trend. We have done this with natural gas (Henry Hub), ammonia, methanol, and iron and steel for the period 1995 to 2009 and for LNG from 1999 to 2008.

Henry Hub Natural Gas and LNG

Shipping logistics and the proximity to the US make the Atlantic basin, and the US in particular, the natural home for Trinidad LNG. While there are contracted volumes of LNG from Trinidad going to other places (Canada accepted its first cargo of LNG from Trinidad and Tobago in 2009, as did Chile) the majority of LNG from Trinidad and Tobago is contracted to the US, where the Henry Hub price quotation is used as the reference price. Over the last year, US gas prices measured at Henry Hub have plummeted from \$12.59/mmbtu in June 2008 to \$3.52/mmbtu in April 2009, a falloff of some 72%, before recovering to US\$3.91 in June 2009.

Chart 1 - Henry Hub Natural Gas



Source: Natural Gas Week; computed data.

Generally, prices for natural gas in the US remain low as natural gas supplies continue to seep into a weak market.

Looking at the Chart 1 for natural gas (1995-2009), it is clear that the current gas price is significantly lower than the long-term trendline which would seem to indicate, which under normal circumstances would point to a significant uptick in gas prices to reach trend. However, given the ongoing falloff in US aggregate demand due to the US recession, that day is likely to be some way off. This seems to be reinforced by the fact that the

12-month moving average price is currently below the long-term trend average and trending downwards. In the medium term, improvement in the economy is expected to contribute to limited demand recovery in early 2010, but an anticipated recovery in overall production levels from that time will curtail the overall upward trend in prices. From 2010 production from the Gulf of Mexico is expected to increase due to the startup of new production associated with offshore oil projects and the recovery of output shut in from hurricanes in 2008.

Table 2
Selected Economic Indicators – The Role of Energy (%)

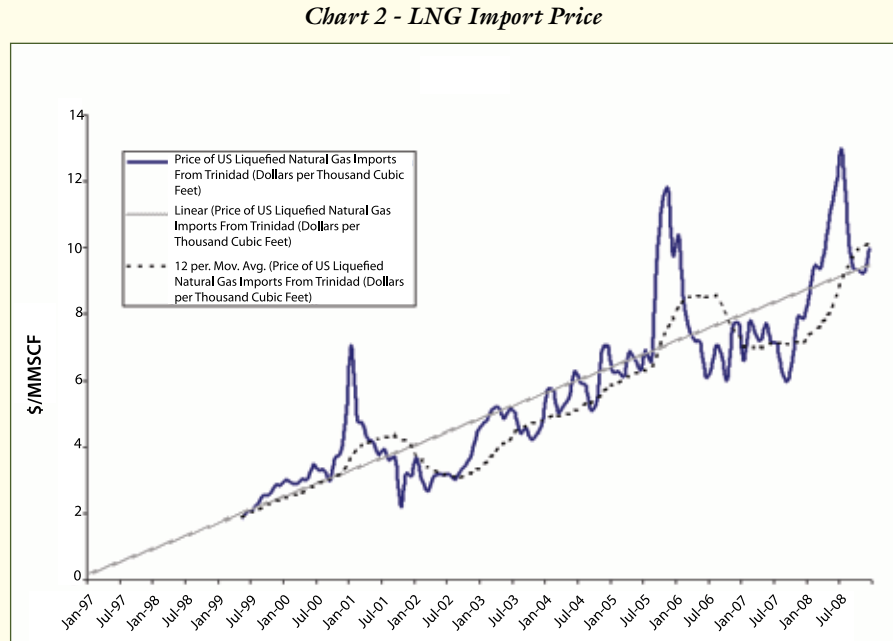
	1995	2000	2003	2004	2005	2006	2007	2008
Energy GDP/Total GDP	27.9	25.2	36.2	37.4	41.9	45.1	43.0	39.4
Energy revenue/Total revenue	30.0	34.3	42.7	42.9	53.3	60.3	56.0	57.7
Energy exports/Total exports	71.4	69.7	81.5	80.3	88.9	91.0	89.4	86.4
Energy employment/Total employment	3.6	3.2	3.4	3.2	3.6	3.4	3.5	4.0

Source: Central Bank of Trinidad and Tobago

The data for LNG presents an interesting conundrum. In recent months, LNG netback prices from Trinidad and Tobago into North America have inched upward, though still below spot Henry Hub prices. LNG netbacks from Spain continue to fall and remain well off their peaks of late 2008, and LNG netbacks overall have declined precipitously from their highs of mid-2008. While the price of US LNG imports from Trinidad and Tobago seems to show that LNG prices are trending marginally above the long-term average as of December 2008 (the last month for which that data is available), data on LNG netbacks in the US (Everett) paint a very different picture. Like natural gas, the data seem to indicate that the netbacks are trending significantly below the long-term average. Potentially more troubling in terms of revenue generation, though, is the fact that the slope implies that LNG netbacks to the US will decline over time. However, the brevity of the series casts a shadow of the reliability of forecast.

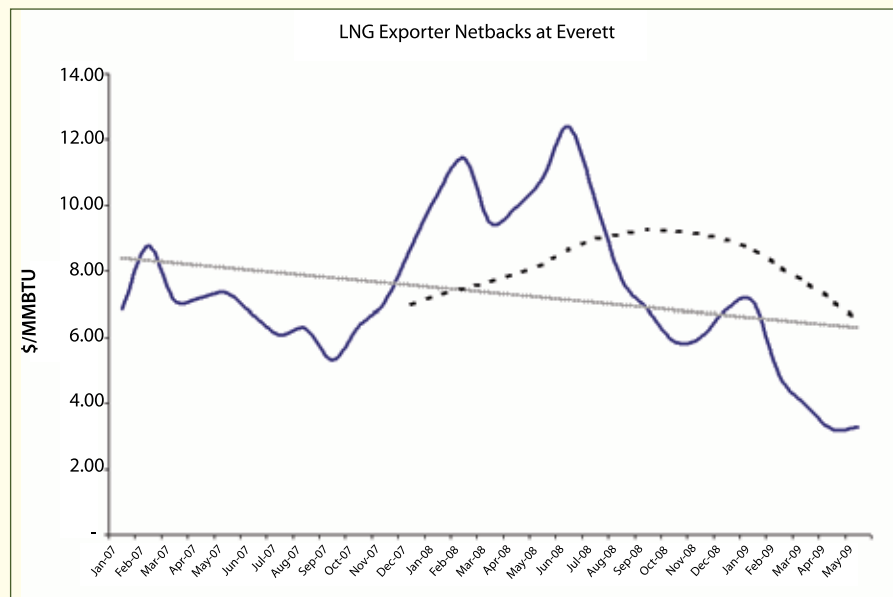
Ammonia

The global economic crisis has manifested itself in a sharp decline in ammonia and other fertilizer prices. Notwithstanding a decline in aggregate economic output, ammonia (unlike methanol) is not as closely tied to the fortunes of the global economy, as farmers still have to plant crops. However, a combination of high grain stock levels and the depressed economic conditions (at least until 2010) means that the ammonia market remains depressed. Global ammonia production registered a modest 1.2% growth to 156.2m tonnes NH₃ in 2008 following on growth of 4.5% growth in 2007 to 154.4m tonnes NH₃. Global ammonia trade in 2008 was stagnant at 19.2m tonnes NH₃. Data from the IFA note that supply and demand balances show the emergence of a large potential



Sources: EIA; computed data.

Chart 3 - LNG Netbacks



Sources: World Gas Intelligence; computed data.

surplus of about 6.3m tonnes N in 2009, up from 4.8m tonnes in 2008. This surplus has mostly emerged during the first half of 2009. With little demand from China and India (one of the few economies expected to grow in 2009),

the European ammonia market has appeared to enter into the “summer doldrums” early with little ammonia product needed in the second quarter of 2009. Like LNG, the ammonia chart seems to indicate that the ammonia

price, despite an uptick in recent months, is still tracking far below the expected long-term trend average. More importantly the graph shows that over the period January to November 2008 the price levels were an aberration, well above their long-run average.

Methanol

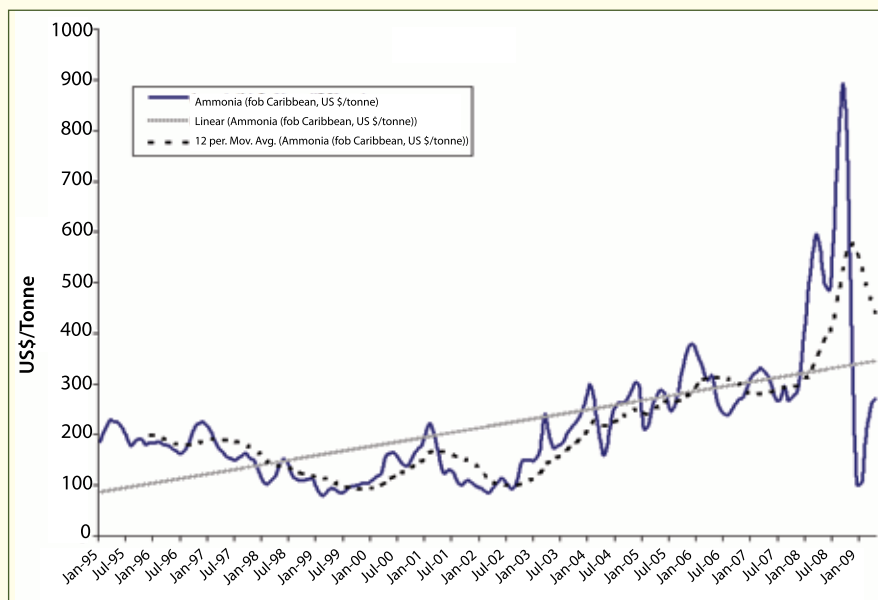
Economic data seem to suggest that general economic conditions are stable, with the bottom of the “recession U-curve” being reached. While the overall economic recovery is expected to be much slower than past recessions, at least there is improving optimism in the methanol sector and a rise in overall confidence.

The trends for the main methanol derivatives remain the same, with most facing poor demand through the first five months of 2009 with only spotty improvements for the balance of the year. Formaldehyde producers in North America and Europe still indicate demand in many of their sectors is down 15-25% year on year, linked to the ongoing economic doldrums.

On the supply side, four new units (Malaysia, Iran, Venezuela and Brunei) add as much as 5 million metric tons of lower-cost capacity to the methanol industry in a time period when methanol demand is likely to be flat. With ample supply, there are few potential factors that lead to methanol price optimism. Spot prices seem to be stabilizing in China, while surprisingly on the rise as June begins in the US Gulf. Contract prices for May and June are flat.

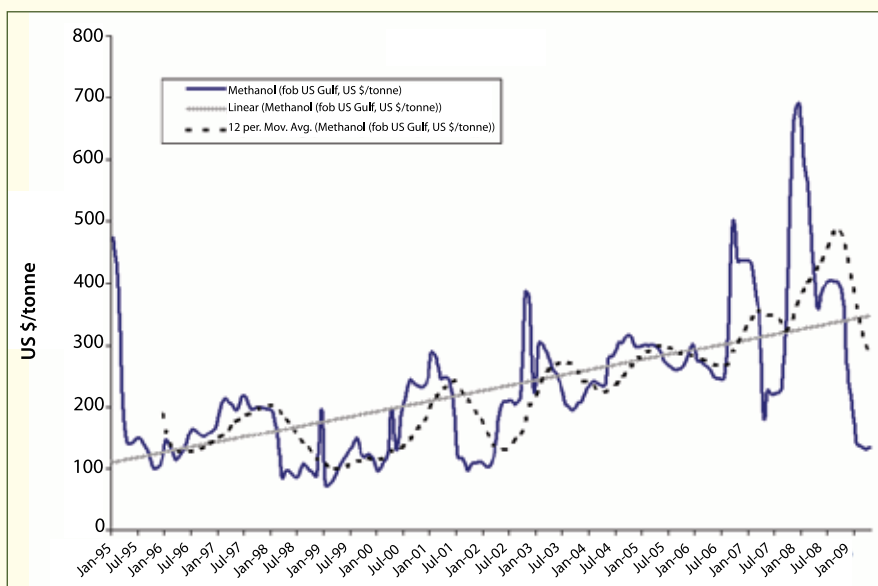
However, short-term forecasts point to spot prices being volatile and fluctuating among regions. Contract prices across the industry are poised to be flat through 2009. Like ammonia, methanol is tracking well below the long-term average price trend, though there are some signs of a change in direction for methanol. The methanol market is one that is subject to peaks and troughs around the trend, as is observed

Chart 4 - Ammonia



Sources: Fertilizer Week, various issues; Green markets, various issues; computed data.

Chart 5 - Methanol



Sources: Methanol Market Report, various issues; computed data.

in 2002 and 2007 when price troughs followed short-term peaks in prices. Again, the price levels recorded in the first half of 2008 are an aberration, being significantly above trend.

Iron and Steel

The iron ore and steel markets are also suffering from the effects of the

global economic crisis. In the specific case of Trinidad and Tobago, some facilities have been idled while future sector expansion (the Essar Steel project) has been put on hold. Internationally, as the global economic recession deepens, the outlook for the steel-using industries in 2009-2010 is grim, particularly in the first half of 2009. The outlook

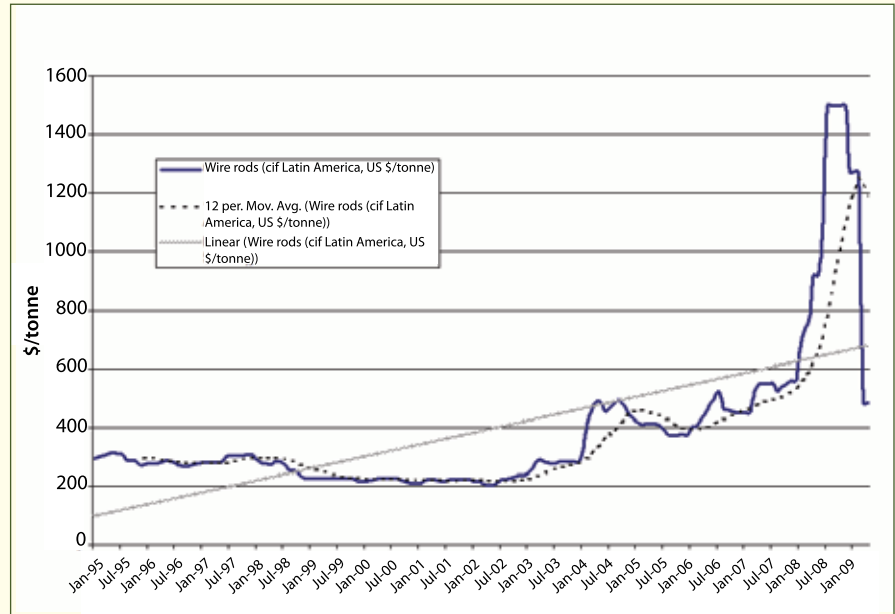
for 2010 remains depressed: real steel consumption will remain at a low level, while apparent consumption could see some growth. However, trends in nickel prices (a barometer for the overall iron and steel market) seem to indicate that there may be a slow recovery for iron and steel prices in 2010. Chart 6 shows the long-term trends for wire rod prices. The sharp rise in prices in 2008 is only matched by the even more rapid fall; nevertheless, the commodity currently is priced slightly below its long-term average. Once again, the graph shows a familiar feature. Prices during the period January 2008 to October 2008 were an aberration well above the long-run average.

Conclusion

The prime determinants of economic growth in this economy remain the oil and gas sectors, with the latter sector being responsible for more revenue than the oil sector in recent years. This is expected to remain so for the foreseeable future. The analysis of the prices for commodities listed above seems to suggest that, with the possible exception of LNG, they are all trending below their long-term average trend prices. The recent years have been an aberration. In the case of Trinidad and Tobago, one or two commodities doing so will not have a heavy impact on GDP or Government fiscal accounts. However, when all the commodities fall steeply in tandem, as they did between the last quarter of 2008 and 2009, there are significant implications for policy and expenditure at the national level. But how is this expected to influence the economy over the next 12 months?

Firstly, the global economic crisis and the lack of any major projects starting up in Trinidad and Tobago in 2009 mean that the trend of the oil and gas sector driving overall economic growth will remain unchanged. In this case, however, the stagnation of the sector

Chart 6 - Wire Rods



Sources: Metal Bulletin, various issues; computed data.

in 2009 is expected to be reflected in overall economic projections pointing to aggregate country growth of less than 1% in 2009 at best. A couple of points must be concluded, though, and this may be considered for future policy, especially given the pervasive nature of the current downturn.

- i. Diversification within a particular sector of the economy is no longer a necessary and sufficient strategy for minimizing risk. Part of the rationale for Point Lisas was that the gas-based industries would diversify the economy. What the current crisis has shown is that while the ongoing gas based development has had benefits in terms of revenue gained, it has not been as successful as a vehicle for mitigating risk. Consideration of some countercyclical investments (that may not cleave to the petrochemical industry cycle) may be worth considering.
- ii. Similarly, diversification within the home country alone is no longer a

- sufficient strategy for minimizing risk. The concentration of the energy investments within Trinidad and Tobago has meant that these investments are very susceptible to local economic factors. While standard risk assessments should be done on these investments, there may be a case for extending the investments to other countries.
- iii. Finally, any fiscal benefits based on the exploitation of a finite resource should always skew heavily towards the generation of a sustainable source of revenue, even when the original resource is no longer present. Revenue stabilization funds are one method of doing this, and have the benefit of allowing some of the funds saved be available for real economic emergencies, without allowing abnormally high revenue inflows (from high commodity prices, for example) from contaminating the economy.

NGC'S BALANCED SCORECARD SYSTEM HELPS IT FIND THE RIGHT BALANCE

In 2004 NGC introduced the Balanced Scorecard (BSC), a strategic management system that has been used by companies worldwide to help them attain and maintain alignment with their strategic goals and objectives.

The BSC is specifically geared towards driving performance across the Company, while also allowing for the quantification of actual results. In other words, it does not just allow for an assessment of how much work is being done, but whether the right things are being done correctly. Admittedly, it is a complex system with a significant learning curve for employees at all levels, but it is well worth the effort of implementation.

Among its advantages are that it allows for broad-based measurement of NGC's performance, not just at the financial and operational levels, but across several other perspectives. More specifically, the system allows the Company to monitor its customer relationships, internal processes, its learning and growth, financial performance, and stakeholder relationships.

Clearer Objectives Mean Improved Performance

This shift towards a more strategic business management tool has allowed NGC to improve upon a number of shortcomings in the systems that previously existed. The model allows the Company to more clearly define objectives and accountabilities, provide more measurable, defined targets, report quantitatively rather than qualitatively, and link individual employee performance directly to strategic objectives.

The ongoing performance monitoring is proving to be especially beneficial to employees on an individual level, as frequent supervisor feedback gives them multiple opportunities for adjustment throughout the year. The same can be said for larger groups, such as work units, departments, and divisions.

The Balanced Scorecard system was adapted to suit NGC's needs. Specific,

quantified targets and weights were set at the corporate level by the Executive Management Team. Managers were then asked to create a linked scorecard for their respective areas, whereupon their targets and weights were approved by their Vice President or the President.

As the system was rolled out, targets and actual results were periodically reviewed. Where necessary, they were adjusted based on the current situation. This flexibility is a particular advantage, considering the dynamic nature of the environment in which NGC operates, and the need to make small or large adjustments with little notice.

The BSC was also linked to NGC's Individual Performance Management System (IPMS), so that in 2007, for the first time, it was used to determine annual bonuses.

This makes the payment of gain share bonuses to employees more target-based. Previously, employees were paid a specific percentage of company profits, pro-rated according to their salary range. Since the introduction of the new system, scorecard points are calculated according to pre-set ratios at the corporate, group and divisional levels. The scores are then weighted at each level.

This linking of reward to performance will act as a motivator, encouraging employees to extend themselves even further, as individuals as well as within their respective groups. In addition, bonus payments based on the Balanced Scorecard are separate from merit payments which are based solely on an employee's performance during the previous year.

Fine-tuning the System

As with all systems, especially newly introduced ones, assessment of the system itself is necessary. In the few years since the implementation of the Balanced Scorecard, several key lessons have been learned.

First, experience showed that some targets were set either too high or too low. The difficulties in setting these targets may stem from a lack of historical data over the years, or the absence of

measurement systems. As data collection and retention systems improve, however, more concrete information will provide the basis for more realistic, achievable targets in the future.

A second challenge was the difficulty in measuring some objectives, especially in the face of the intangible nature of the tasks involved. In other cases, objectives were greatly impacted upon by influences outside of the Company's control, making them difficult to achieve.

There are also cross-company targets, in which two or more work units are expected to work closely and support each other in the pursuit of a single objective. This required clear directives from upper levels, and buy-in from all involved. Properly implemented, the system will result in the reduction of silos across the board, greater co-operation between units, and a better understanding by employees of company operations that fall outside of their personal areas of expertise.

Of course, as NGC continues to fine-tune the system to suit its needs, adjustments will continue to be made. It is also important that staff grow more at ease with the system and turn to it for guidance in setting and achieving their own personal goals and fulfilling their responsibilities.

The Way Forward

The way forward for the BSC, therefore, is to pay closer attention to the kinds of measures being used and the way in which the targets are being set. NGC will continue to make greater use of outcome measures, which reflect the value being created by each unit, rather than on output measures, which only reflect the amount of work completed. That is to say, the Company will focus less on "working hard" and more on "working smarter".

Having already begun to experience the positive effects that the system has had on its performance and processes, NGC is determined to continue to refine and improve upon it, believing that improvement comes with continued use. The Company expects full alignment by 2010.

NGC Welcomes New Chairman

NGC has a new Chairman, Malcolm A. Jones, who assumed his post on 24 July. As one of the early pioneers of the local natural gas industry, Mr. Jones brings over 40 years' experience to NGC's Board. Mr. Jones played an important role in the development of the Point Lisas Industrial Estate and from June 1981 to December 1983 he was the Head of the Methanol and Urea Divisions of the National Energy Corporation of Trinidad and Tobago Limited which was responsible for the development of the first methanol and urea plants located at Point Lisas. Mr. Jones previously spent 12 years at the helm of NGC, first as its General Manager from 1984-1990 and later, as its President and Managing Director from 1991 to 1996.

His significant accomplishments at NGC include:

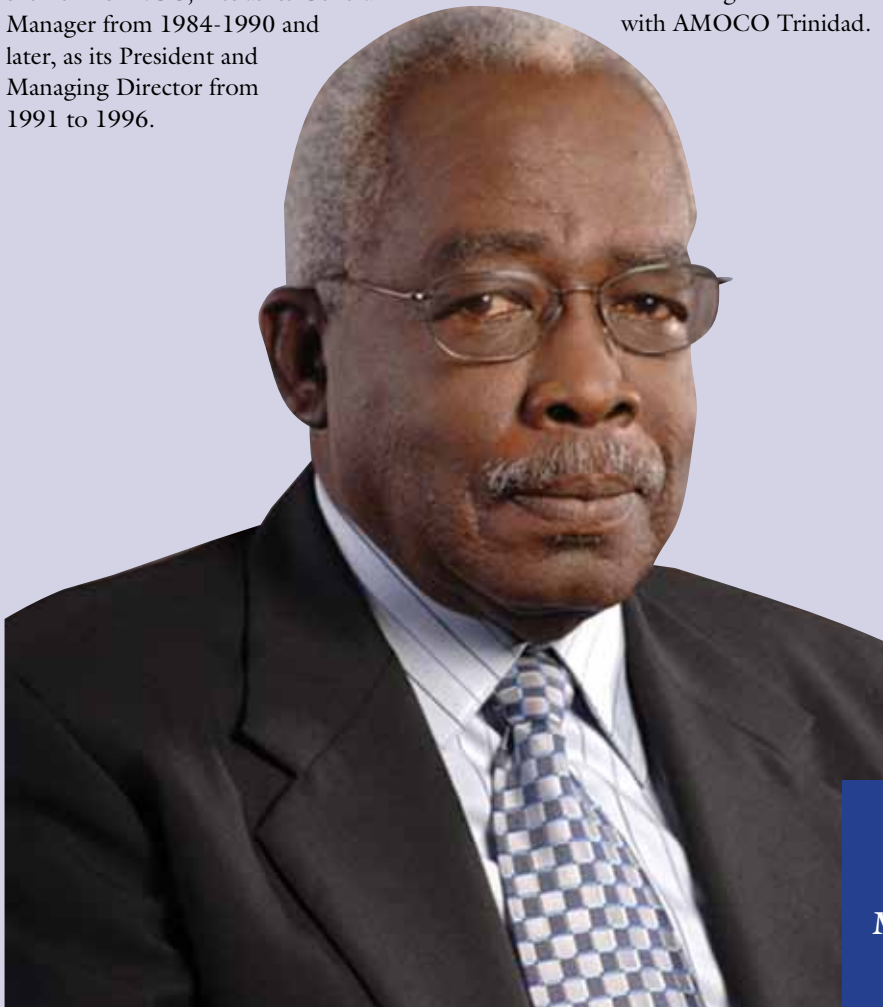
- An increase in gas sales from 343 MMscf/d in 1985 to 723 MMscf/d in 1996.
- An increase in the customer base from 27 small and nine large customers in 1984 to 72 small and 15 large customers by 1995.
- The implementation of a product-related pricing formula for the petrochemical sector.
- The establishment of Phoenix Park Gas Processors Limited (PPGPL).
- The negotiation and conclusion of the 1991 Gas Sales Agreement with AMOCO Trinidad.

- The acquisition of a 20% shareholding in Trintomar – the first local marine gas-producing company.
- The restructuring of NGC to meet the demands of its offshore operations.
- The development of NGC's first strategic plan.

From 1996-2002, he served as the President and Chief Executive Officer of Titan Methanol Company and from 2003, as Executive Chairman of Petrotrin, the State-owned oil company, becoming its longest-serving Chairman.

In 2004, Mr. Jones' accomplishments and contributions to the energy sector were formally recognized by the State when he was awarded the Chaconia Medal (Gold) for long and meritorious service in the sphere of National Economic Development. He was also awarded a Career of Excellence in Engineering by the Executive Council of the Association of Professional Engineers of Trinidad and Tobago (APETT) in that same year. In 2007, he was the recipient of an Honorary Doctorate in Engineering and Entrepreneurship from the University of Trinidad and Tobago.

He is also a member of the National Energy Committee, a Cabinet-appointed group that reviews the energy sector and makes recommendations on critical issues.



Malcolm A. Jones

One of the early pioneers of the local natural gas industry, Mr. Jones brings over 40 years' experience to NGC's Board

NGC TOBAGO ONSHORE GAS/METERING FACILITY



Gas Receiving Facility – Tobago Pipeline Project.

Tobago Pipeline

Up to March 2009, Technip invested 150,000 man-hours and NGC and its contractors have completed 100,000 man-hours on the project without accident or incident for a total of 250,000 man-hours to mid-year 2009, the first milestone in the team’s drive to achieve one million safe work hours before the project’s completion.

Safety has been a guiding principle in the processes implemented on the project and all procedures are consistent with NGC’s guidelines, are reviewed and signed off by Technip and NGC and enforced strictly in the field. Detailed engineering designs of the pipeline are close to completion, and the facility is 76% complete. The overall project status is at 40%. CVA contractor Casbarian Engineering Associates has commenced work. The project will route two lines from the BHP Billiton Platform off the North East Coast. The 84-km, 36-inch NEO line will travel south to make landfall at the Mayaro Bay Regulator Station, while the 54-km, 12-inch Tobago line will travel north to Tobago, coming ashore at Cove.

The project team awaits the granting

of a CEC for the Tobago Pipeline from the EMA. NGC has been granted approval by the EMA and the Tobago House of Assembly to commence civil works required for the onshore facility since such works are consistent with those being undertaken by e TecK in developing the estate.

Civil works contractor Carillon has mobilized on site and NGC has undertaken PLEA training of 30 Tobago workers engaged by subcontractor Seereeram Brothers, Tobago.

Two shipments of 12-inch pipe and three shipments of 36-inch pipe for the Tobago and NEO pipelines respectively have been received at Port Brighton.

Two shipments of 12-inch pipe and three shipments of 36-inch pipe for the Tobago and NEO pipelines respectively have been received at Port Brighton

Bredero Shaw has completed concrete coating of 1,000 of the 12,000 joints and is scheduled to complete this phase of the project by the end of August 2009.

Horizontal directional drilling operations on the two shore approaches are scheduled to commence in September, pending the receipt of the appropriate project CECs. Construction completion of the pipeline is scheduled for January 2011. In the intervening period, NGC will roll out an outreach programme to promote natural gas literacy and safety to schools and the adult population. In addition a community relations programme has comprised training modules in boat repairs and process plant operations.

Liquid Fuels System

The project partners of the Liquid Fuels System Project, National Petroleum, Petrotrin and NGC, have been assigned critical responsibilities for construction and operation of the system by the Government of Trinidad and Tobago. NGC’s responsibility to project-manage and construct the system has been



Pipelaying – Liquid Fuels pipelines

expanded to include the maintenance of the pipelines and the Right of Way clearances. The project has logged 67,839 man-hours without accident or incident as of March 2009. Design contractor for the project, Kellogg, Brown & Root (KBR) has completed pipeline engineering designs, the fire protection design and control systems designs. Process designs, mechanical and electrical designs are substantially advanced.

NGC has awarded contracts to two local construction companies to construct the liquid fuels pipelines. South M Construction Limited will construct the segment of the multi-product pipeline from Pointe-à-Pierre to Phoenix Park Gas Processors Limited. Trinweld Contractors Limited will construct the remaining segment from





Pipeline configuration at Beachfield.

Pierre Road to the Frederick Settlement facility and the Jet Fuel line from Frederick Settlement to NP’s Piarco receiving facility.

Namalco Construction Limited has been contracted to fill the 22-acre site at Frederick Settlement Industrial Estate allocated for the loading and shipping terminals, a project expected to last 12 weeks. NP will operate the system, inclusive of the four dedicated storage tanks at Petrotrin’s Pointe-à-Pierre compound, the receiving, loading and shipping terminals at Frederick Settlement and Piarco and the jet fuel pipeline from Frederick Settlement to Piarco.

Petrotrin is responsible for construction of the cross-refinery pipeline at Pointe-à-Pierre and the supply of electricity for the facilities related

to the project on its compound. Det Norske Veritas, the Certified Verification Agent on the project, inspected the Chinese Pipe Mill and carried out detailed inspection of pipe manufacturing processes and both internal and external pipe-coating processes. ANSA Technologies, contractor for the supply of pipe, has delivered all materials to Pt Lisas.

Long lead time items such as mainline valves, pig traps, and launchers and loading rack skids have been ordered by KBR. Contractors have been gearing up in anticipation of the granting of the CEC for the project. Appropriate HSE training and orientation sessions have been conducted for construction workers. The project team and Kaizen, the contractors for the Environmental Impact Assessment, continue to respond

to queries from the EMA, submitting appropriate details and clarifications to the authority.

Tamana Gas Main

NGC commenced works on a natural gas main along the Government Railway Reserve and Cumuto Main Road to the Tamana In-Tech Park. The project involves the construction and laying of six-inch, four-inch and two-inch-diameter natural gas distribution pipelines in the park and a six-inch gas line on the public access roadway. Construction will utilize the “open cut” trenching method primarily, and horizontal directional drilling (HDD) techniques will be used in some areas to minimize public inconvenience and environmental impacts.



Industrial Estate at Pt Lisas circa 1994.

Pt Lisas Estate, South and East

The Ministry of Works and Transport is managing the proposed upgrade to the flyover at Indian Trail to create a limited interchange designed to alleviate traffic and congestion associated with ingress and egress from the Solomon Hochoy Highway to the Estate and the Southern Main Road.

Estate infrastructure design will be finalized and submitted by the end of July, 2009, inclusive of roads, drainage and utility reserves for 50 two-hectare, fully-serviced lots earmarked for small industry.

Galeota Port

A CEC was granted on June 15, 2009, and NEC is working to complete

the conditions of the certification by providing data requested. Designs for the project are complete, and the contractor has delivered materials to the site to commence construction of the fish-handling facility. The project will make use of local content, and contracts with local suppliers for hauling piles, blasting and coating, supply of fill materials and construction of the fishing port have been awarded, with project manager Grandi Lavori Fincosit (GLF) overseeing the project.

Oropouche Bank

Technital, the consultant on the project, has submitted proposals which address clarifications requested by the Environmental Management Authority (EMA), including the definition of the shape and location of the reclamation,

the access link to the mainland, the location and source of fill materials, dredging and reclamation methodology and the stability of the proposed island. Significant design work has been completed on hydrodynamic modelling, preliminary engineering data collection and feasibility studies.

Alutrint Dock

The project is 85 per cent complete, and contracts for the materials handling facility and conveyor link to the site from the Alutrint factory site have been awarded. The design and construct model designs for the storage yard have been received and are now up for peer review by a consultant retained for that purpose. Contractor GLF has mobilized and site preparation works have begun.



Fabrication Yard – Brighton Port, La Brea.

Brighton Port

Reconstruction work on the Berth 1 project is approximately 60 per cent complete. All of the tubular piles have been installed, and the installation of sheet piles is 95 per cent complete. Eighty per cent of the pre-cast beams on the dock facility have been installed. Production of pre-cast slabs has begun at Pres-T-Con's facility and preparation for additional concrete works on the project has been agreed on and is currently on schedule. The Berth 1 project has achieved 56,651 accident- and incident-free man-hours.

Union Industrial Estate

Trinidad Generation Unlimited (TGU) held its formal launch of the construction

phase of its new 750-megawatt combined cycle power plant on the site. TGU is a joint venture between AES and the Government of Trinidad and Tobago. Man Ferrostaal has been engaged as the main contractor to supply turbines and generators as well as to undertake the construction of the power plant. Components for the plant began arriving in late June. Auger piles and driven piles are being installed as part of the foundation works on the TGU site. Royal Haskoning has been contracted to undertake peer review of the designs for the drainage works to alleviate erosion issues and water quality problems on the site related to the Vessigny River.

Labidco has experienced some delays in the certification required for the cutting of abandoned wells from the Ministry of Energy and Energy

Industries. These certificates should be available at the end of July 2009. Petrotrin has prepared a scope of work for the removal of two tanks that are in the buffer zone on the Alutrinit site. A contract for the commencement of the project is expected by the end of August 2009.

The internal access road to the T&TEC substation site has been completed. This road will serve Trinidad Generation Unlimited and NGC, as well as other tenants that will be occupying the estate. NEC continues to ensure compliance of on-site activities with the CEC via fortnightly audits. A contract for the paving of the main corridor road has been granted to Sunco Engineering. This roadway is currently sprayed with water to control dust, and the paving process will ensure compliance with appropriate health standards.

Centrica Invests in Gas Blocks

The Government of the Republic of Trinidad and Tobago and Petrotrin signed a production-sharing contract with Centrica energy for exploration of Block 2 (ab) of Trinidad and Tobago's east coast. Exploratory drilling has identified significant gas reserves at the block, with recoverable reserves attributable to its stake estimated at 650 billion cubic feet, or half of Centrica's current UK gas reserves.

Centrica, the parent company of BG, is also in line to buy Canadian Superior Energy's 45 per cent stake in Block 5 (c), pending Government approval, at a cost of US\$142 million. Canadian Superior Energy has acquired the shares in Block 5 (c) from Challenger Energy, its partner in the development project, which will allow it to retain an interest of up to 25 per cent in the gas field. Centrica's prospects in Block 5 (c) are very positive and the field is close to existing gas pipeline infrastructure.

Centrica has also bought a 65 per cent interest in Block 2 (ab) split with Petrotrin, which holds the remaining 35 per cent share. Centrica will invest US\$48.3 million in exploration of the block over the next three years and has further committed to funding contributions of more than US\$11 million for research and development, training and scholarships over the life of the contract.

The Block 2 (ab) agreement includes the acquisition of 3D seismic data and the drilling of three wells, two at 2,500 metres and the third at 2,850 metres.

Revamping Energy Finance

Minister of Energy Conrad Enill announced in July that the fiscal regime under which energy companies operate is under review and changes will be rolled out for the upcoming 2010 bid round.



Modern skyline of Port of Spain – aiming to become the financial hub of the Caribbean.

Proposals are being considered to minimize the upfront risks to investors while ensuring equitable returns for both the investor and the Government. Minister Enill has noted that US\$185 million in planned investments over the next four years in Trinidad and Tobago has been withdrawn in the wake of the global economic crisis.

Global upstream oil and gas investment budgets have been cut by 21 per cent through cutbacks in spending, project delays or cancellations to the tune of US\$100 billion globally, according to the International Energy Agency.

Caricom Gas Trade Discussions

Prime Minister Patrick Manning has initiated discussions with Jamaica to establish mutually beneficial ties between the two nations which share interests in natural gas and aluminium.

Jamaica is a producer of alumina, which requires substantial gas supply and Trinidad and Tobago is a leader in natural gas production with plans to

establish an aluminium smelter plant. Discussions on the matter have been dampened by Jamaica's previous attempt to contract for a supply of 1.1 million tonnes of gas per annum at a mutually agreeable price, the presence of the PetroCaribe initiative, the trading terms set out in the CSME under the Revised Treaty of Chaguaramas and the export value of each island's products.

Discussions on the best way forward for the Governments of Jamaica and Trinidad and Tobago remain at an early stage.

Gas Pipeline Extension to Barbados?

The pipeline from Trinidad to Tobago is due for startup by first-quarter 2011, according to Arnold De Four, Vice-President Commercial at NGC. Mr. De Four said Trinidad is awaiting the go-ahead from the Barbados Government, which is concerned about the financial viability of receiving natural gas from T&T, via an extension of the Tobago line northwards to Barbados. This extension adds another market for the sale of gas.

one
moment
please

to reflect on the beauty
that surrounds us here
in Trinidad and Tobago



Fishing boats sit in the waters of the tree-lined Las Cuevas Bay. Named after its array of coastal caves, Las Cuevas is one of the smaller and more serene spots on Trinidad's North Coast Road. Besides the partially submerged caves and fishing depot (where fresh fish and lobster can be purchased), visitors come to Las Cuevas for a more quiet and calm beach experience.

Photo by Kevin Reis



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