

GASCO NEWS

THE CORPORATE JOURNAL OF THE NATIONAL GAS COMPANY OF TRINIDAD AND TOBAGO LIMITED
GASCO NEWS VOL. 13 NO. 3 JULY/OCTOBER 2000

**Forecast for
petrochemical/
gas-based
developments**

NGC
celebrates
25
years

NGC Celebrates 25th Anniversary



Mr. Errol Mababir, former Energy Minister, made the feature address at NGC's Anniversary Celebration on August 25, 2000.



**THE NATIONAL GAS COMPANY
OF TRINIDAD AND TOBAGO LIMITED**

The power of two. NGC and YOU®

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of Trinidad and Tobago Limited (NGC)

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FORECAST FOR PETROCHEMICAL/GAS-BASED DEVELOPMENTS IN T&T

2000 Latin American Methanol Conference
held at Hilton Trinidad & Conference Centre

May 30 – June 1, 2000

HISTORICAL OVERVIEW

The developments experienced in Trinidad and Tobago's petrochemical and gas-based industry over the last 20-odd years largely had their direct origin in the country's deliberate gas monetization policy, essentially led by the State.

When one examines the history of gas utilization from the mid-1970s it shows the laying of the foundation by the State to exploit new-found offshore gas reserves, through its investment in substantial pipeline infrastructure. This enabled the transportation of gas from offshore the south-east coast — the sparsely populated, unsheltered side of the island — across country to the more densely populated west coast, which borders the more sheltered waters of the Gulf of Paria. At a specific location here, which was earlier identified by private would-be developers, the State invested heavily in the development of the 1,800-acre Pt. Lisas Industrial Estate and its associated marine infrastructure.

The foreign Multi-National Corporations (MNCs) meanwhile focused their efforts on two main areas. On the one hand, exploration and production activities were more concentrated on oil, initially giving concessions, at the State's insistence, to provide cheap gas for power generation for the broad-based domestic consumer. On the other

BY CHARLES BAISDEN
MANAGER, PROJECT DEVELOPMENT



Mr. Charles Baisden gained a B.Sc. in Chemistry in 1973 and a postgraduate degree in Petroleum Engineering in 1978, both from the University of the West Indies. In 1982 he graduated from the University of Western Ontario, Canada, with a Master's of Business Administration. Mr. Baisden has been involved in new project development at Pt. Lisas for the past 18 years.

hand, a few of the existing MNCs, at the Government's request, facilitated the State's participation and entry into the industry by joint venture petrochemical entities and in some cases made their ideas available or even brought some of the early business contacts. Several early ideas could not be realized. This was either due to the terms of engagement by prospective investors being unacceptable to the

State, or they were otherwise untimely or unattractive, from market and raw material/energy-pricing standpoints. Many of the unsatisfactory conditionalities were not related to raw material pricing, as such, but moreso to the lack of negotiating leverage when as an inexperienced player we attempted to break into an established global industry.

However, given the State's windfall of "petrodollars" derived from the world oil crises, the country was able to "weather the storm" by still embarking, with full State shareholding, on several pioneering natural gas-based projects. Some would say we still paid "top dollars" initially for the technology and market access as well as high-finance charges. Despite the early setbacks this "brute force" approach in the petrochemicals and other heavy export-oriented industries was to pay considerable dividends in later years, and indeed has brought us to where we are today.

A quick update on the rise to world prominence of the local gas industry in the context of direct gas utilization and exportable commodity-type products could be provided at this stage.

The salient points could be summarized as follows:

- Gas Utilization: Currently stands at over 1 billion cubic feet of gas per day, an average annualized

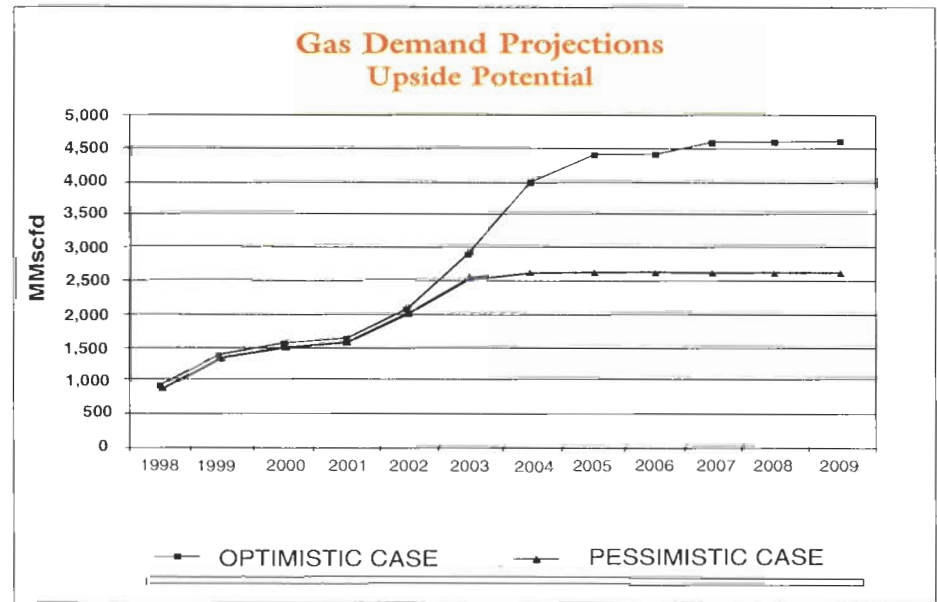
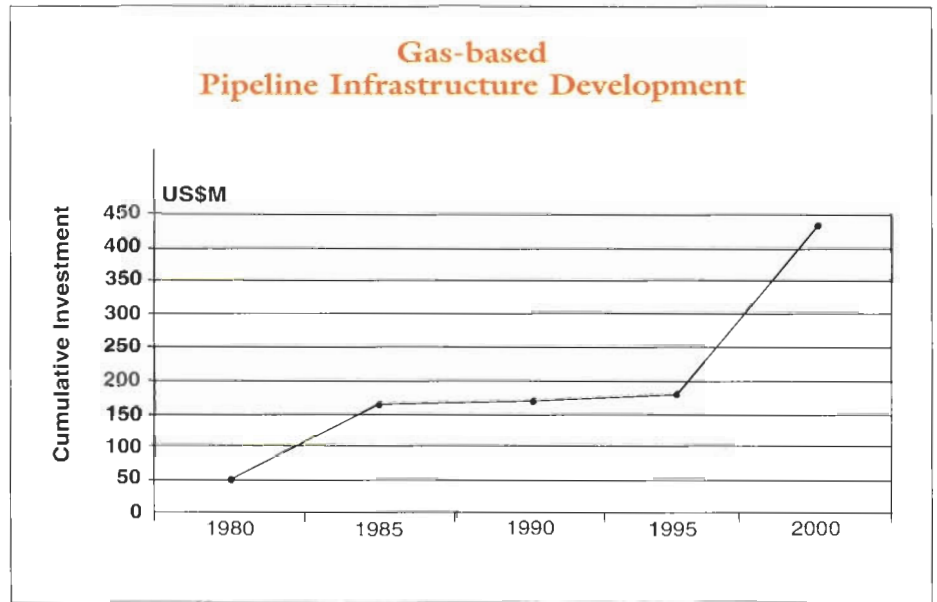
growth rate of 9% per annum since 1980.

- Exportable Products: Produced almost US\$10 billion worth of exportable products since 1980 and currently US\$2 billion on an annual basis.
- Foreign Investment: US\$5 billion.
- Gas Reserves: Consumed 3.5 TCF of gas reserves since 1980. In 2000 reserves stand at over 30 TCF.
- Jobs: Created over 3,500 jobs.

THE INTERVENING YEARS

It has not always been smooth sailing. There were “hiccups” and considerable financial losses. Most significant was the low level of support from the foreign participants. In the beginning, within perhaps the first 10 years, the upstream gas producer profile was essentially in a monopoly mode. Accordingly, their involvement in downstream industry was essentially “hands-off” and strictly in terms of long-term “take or pay” gas contracts with the State. These contracts were often unrelated, on a one-to-one basis, with new downstream demand, and in fact natural gas was priced on a fixed-price basis with an escalator. It was then left to the State to go out and attract customers to satisfy the long-term gas contract. In the interim, the actions of NGC and the State resulted in positive efforts to diversify the country’s gas supply, through its own production facilities and eventual entry of new upstream players. Further, in order to attract new investors, in the face of a fixed escalated gas price from the producers, the State developed its then innovative market-sensitive/product-related gas pricing mechanism. This in fact led to a strengthening of the then current downstream industry, as well as to an upsurge of new consumers starting from the early 1990s.

The early '90s also saw the State, while continuing to play a lead role in conceptualization and development of



new downstream industry, divesting its shareholding in the earlier plants. Efforts were more concentrated on attracting new investors with the enticement of gas pricing concessions, tax/fiscal incentives, as well as other site and marine infrastructure attractions. Needless to say, the upstream aspect of the industry continued to operate on a different, more inflexible basis than what was required to attract new downstream investment. The result of the State’s efforts in any event has been to bring the local gas-based energy sector into even greater focus.

Consequently, Trinidad and Tobago ranks in the number one position as single exporting site for both methanol and ammonia – no doubt a major force in the trading of these commodities. By way of its gas portfolio diversification efforts, the country is also emerging as a significant player in two other commodities, namely steel (DRI/Scrap substitutes) and LNG.

CURRENT DEVELOPMENTS

Several developments have begun to impinge critically on the future

development of the gas-based industries in Trinidad and Tobago. Among these factors, the following are worthy of brief mention:

A. Factors Affecting Global And Local Industry

- Market Limitations in Petrochemical Products.
- the MTBE Factor and Ethanol competition in Methanol;
- the size of the global industry and its capacity to expand, given the rate of demand, in both ammonia and methanol;
- Competition along New Dimensions.
 - new scale economies with improved technology: larger and larger methanol and ammonia plants;
 - new players: gas-rich, export-oriented sites;
 - larger shipment parcels to counter increasing freight costs and distance from market;
 - basis of competition moving more on e-commerce networks and knowledge management as a critical asset.
- New Technology Applications.
 - cheaper, shorter routes to traditional chemical commodities;
 - new technology products to broaden market outlets or to satisfy new environmental standards.

B. Factors Mainly Concerning Local Industry

- Raw Material Focus Shifts.
 - targeting of natural gas extracts higher than methane to achieve high value-added exports;
 - counterbalance to the cropping off and export of the gas value chain at the level of methane.
- New Export Product Shifts.
 - need to diversify gas sales portfolio;
 - LNG emerging as easiest and



Mr. Charles Baisden addresses delegates at the 2000 Latin American Methanol Conference in Port of Spain.

- fastest way to commercialize the gas reserves;
- GTLs having the potential to equate LNG in usage and investment intensity, with higher value added potential benefit to local economy.
- Expansion Pressures Due to New and Potential Gas Discoveries.
 - given the market limitations, there is perceived to be considerable anxiety on the part of new lessees and potential operators to commercialize new discoveries and recover their investments;
 - this could place considerable capacity and expansion pressures on related local infrastructure: site availability, pipeline, port/harbour infrastructure.
- Role of State.
 - In the context of conflicting needs for
 - maintaining a balanced gas portfolio;
 - ongoing gas monetization;
 - a gas depletion policy;
 - maximizing of value-added benefit to local economy from the natural gas resource;
 - satisfying infrastructure requirements;
 - maintaining an active presence in the gas value chain locally;
 - deriving adequate equity, tax and other returns;
 - the high capital and technology requirements to achieve the above.

IMPLICATIONS AND RESPONSES REQUIRED

In the face of these industry developments, certain shifts must occur in the conduct and operation of the key local players. Such suggested approaches may involve the following:

A. Raw Material Pricing

It seems imperative that the major local gas producers must become more responsive to global market forces. This will in turn enable local petrochemical producers to adequately

keep pace with trends in global competition. It would also accommodate new local expansion in the industry.

B. State Involvement

One must be reminded that this country is a small independent state that is endowed with a valuable natural resource. But we lack, in large measure, the negotiating leverage associated with having a large domestic or other captive market, and similarly we lack technology ownership and adequate capital to fund large-scale energy-based projects. There must therefore be involvement of foreign transnational players. The national interest must be adequately protected under such circumstances by ongoing direct State participation, regulation and/or facilitation throughout the gas value chain.

C. Partnerships

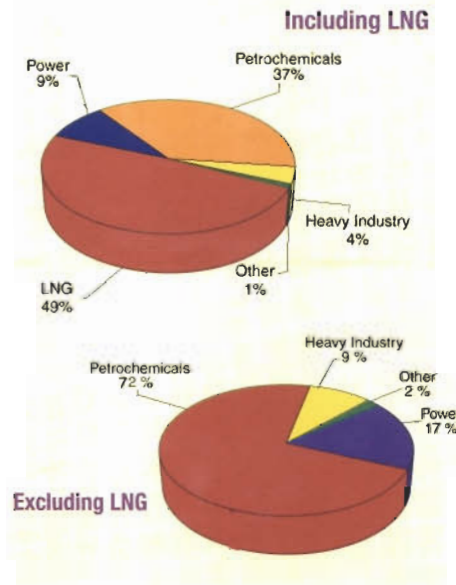
National and commercial goals, conflicting as they may seem, can only be achieved by full recognition, on all sides, of the need to foster and maintain appropriate partnership links, necessarily involving the State. It is quite conceivable that such links may well be also consummated, with the State, outside of this country's borders. In fact, this could present a strong case for the internationalization of the State's (or other local entrepreneurs') involvement in the industry. This may be achieved either through purchase of shares in multinational giants that operate here, on foreign stock markets, or by the deliberate set-up of joint ventures outside of Trinidad and Tobago.

OPPORTUNITIES ARISING

In a nutshell, the immediate opportunities that should be seized in moving the industry forward include, inter alia:

- Market-responsive raw material

Gas Utilization 2005



pricing, virtually from the well head.

- Joint efforts by all parties locally, at achieving efficient customer-oriented, competitive transportation of raw material, as well as final products.
- A joint approach in:
 - achieving downstream growth and maximizing local value added;
 - penetrating new, high-margin markets;
 - commercializing new technology;
 - materializing cross-border commercial prospects (e.g. commercializing Venezuelan gas);
 - Broadening local participation through company-initiated stock options or public offerings.

GAS DEMAND PROJECTIONS

Bearing in mind that all parties would do their part and seek the best interest of the industry, it is expected that the local natural gas industry will continue to fuel and provide the inputs to support vibrant world-class gas-based industries like methanol. While the emphasis over the next three to five years may well be LNG, we are redoubling efforts to

diversify our portfolio and to include higher value-added products. In this regard, considerable efforts are being focused on a petrochemicals complex as well as on implementation of Gas-to-Liquids (GTLs) and aluminium facilities. The outlook therefore shows conservatively (best estimate) that, excluding LNG, domestic gas demand is expected to reach 1.5 billion cubic feet per day by 2005, with an upside potential of 2.0 billion cubic feet per day or over 4 billion cubic feet per day with LNG.

In terms of petrochemicals, methanol, currently comprising 25% of total gas utilised, is expected to maintain a position of 30% of gas utilization (excluding LNG) in 2005.

The investment and employment trends are also expected to pattern the past. It is estimated that capital investment in the sector will increase by US\$3.1 billion by 2005 and a further US\$3.5 billion in the upside potential within this timeframe. Ladies and gentlemen, need I say more about the confidence we continue to have in the sector, particularly when we are addressing our worthy entrepreneurs in the methanol industry. In the final analysis, we prefer, as in the past, to let our actions speak for us, so on this note we conclude with best wishes for the future. ■

THE FUEL CELL - WHERE DOES IT FIT INTO THE NATURAL GAS INDUSTRY?

As we enter the new millennium, there are a number of emerging technologies which are being closely monitored due to their potential impact on the natural gas industry. These new technologies include the Fischer-Tropsch synthesis reaction or Gas-to-Liquids (GTLs), Methanol to Olefins (MTO) and Fuel Cells.

This paper will seek to explore the status of Fuel Cell Technology, identify potential applications and determine its potential for increasing natural gas demand locally.

WHAT IS A FUEL CELL?

The first Fuel Cell was built in 1839 by Sir William Grove, a Welsh scientist. However, it was not until the 1960s that Fuel Cells began to be used in practical applications, where they were chosen by the US Space Programme to provide electricity for its Gemini and Apollo spacecraft. Today, Fuel Cells continue to provide power for the space shuttles. The Fuel Cell's characteristics of high efficiency, very low emissions, fuel flexibility, low noise and vibration have resulted in over US\$1 billion per year being spent on research and development, mainly funded by private and public agencies in the U.S., Europe and Japan. About 80% of this funding is being directed to the development of Fuel Cell Systems for vehicles such as cars, trucks and buses.

A Fuel Cell can be described as an electrochemical device operating on principles similar to a battery. It contains two electrodes, a negatively charged anode and a positively charged cathode separated by an electrolyte. Unlike the battery, a

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PROJECT OFFICER AT NGC



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Fuel Cell produces electricity as long as fuel is continually refilled, and therefore does not require recharging.

The Fuel Cell takes hydrogen and passes it over a porous, negatively charged electrode (the anode) in the presence of a catalyst. Electrons are stripped from the hydrogen and make their way through the external circuit (see Figure 1).

At the same time, oxygen is passed over the other porous electrode that is positively charged (the cathode). During this process, oxygen ions are formed when the oxygen atoms come into contact with free electrons at the

cathode. These oxygen ions in turn interact with more electrons and with positive hydrogen ions that arrive at the cathode via the electrolyte. The products of this reaction are heat, water and the electricity produced when the electrons move from the anode to the cathode (see Figure 2 overleaf). This process converts the chemical energy of a fuel into electrical energy without combustion, making it highly clean and energy-efficient conversion technology.

A Fuel Cell may comprise the following three primary subsystems: a reformer, Fuel Cell stack and a DC-to-AC power converter. The reformer is only required if a fuel other than hydrogen is used. The DC-to-AC power converter takes the DC electricity from the Fuel Cell stack and converts it to usable AC power such as 480 V, 60 cycle or 3 phase AC. Power converters are not required in Fuel Cells for vehicles.

TYPES OF FUEL FEEDSTOCK

Fuel Cells can use pure hydrogen or practically any hydrocarbon (gaseous, liquid or solid) as a feedstock. Due to safety concerns with transportation and storage of hydrogen, developers have been working at alternative hydrocarbon fuels, including natural gas, methanol, ethanol, gasoline and diesel fuel.

Liquid and gaseous hydrocarbon fuels use a process called reforming to produce the hydrogen. In the case of natural gas, production of hydrogen is achieved by steam reforming, i.e. reacting the natural gas with steam at high temperatures. Solid hydrocarbons such as coal, biomass

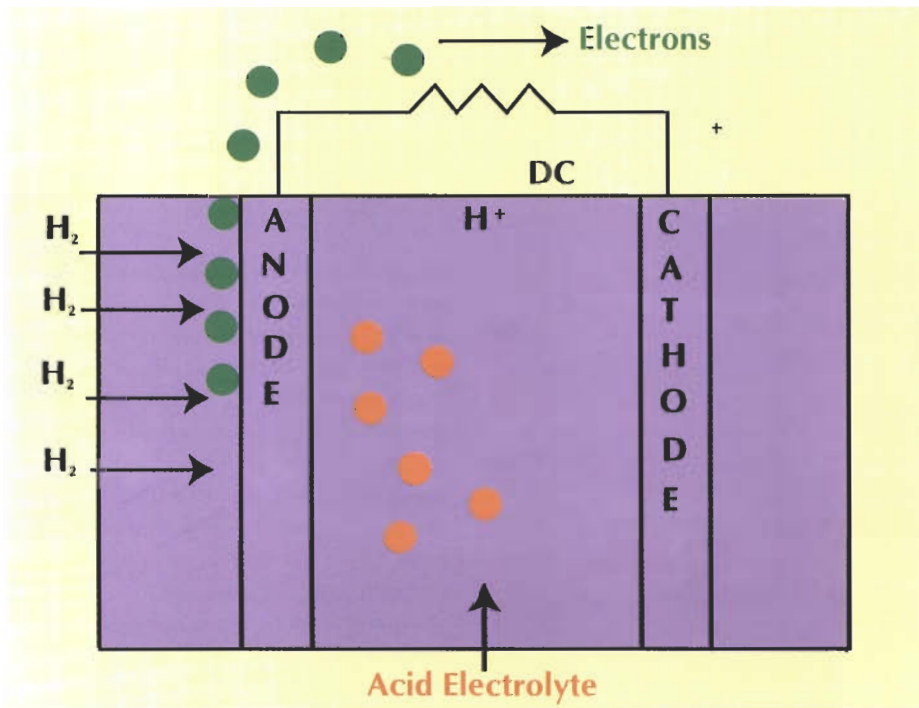


Figure 1 – Simplified Fuel Cell Diagram
 (Source: Department of Energy: Fossil Energy – Advanced Fuel Cell Power Systems paper on http://www.fe.doe.gov/coal_power/fuel_cells/jc_sum.html)

and hydrocarbon waste utilize a process called gasification to produce hydrogen.

Along with electricity, hydrocarbon-fed Fuel Cells also produce heat, water and carbon dioxide as the main by-products. Nitrous oxides are kept to a minimum because the low reaction temperatures and sulphur oxides are not usually created since sulphur is removed from the fuel before use. The Fuel Cell is known for its extraordinary environmental quality of giving ultra-low nitrous oxides, sulphur oxides, carbon monoxide, hydrocarbon and noise emissions.

TYPES OF FUEL CELLS

Fuel Cell types are characterized by the kind of electrolyte material used. The physiochemical and thermo-mechanical properties of materials used in a Fuel Cell, especially the electrolyte, determine the operating temperature and productive lifetime of the Fuel Cell. The five main types

of Fuel Cells currently being developed are:

- Phosphoric Acid Fuel Cells (PAFC),
- Polymer Electrolyte Membrane Fuel Cells (PEMFC),
- Molten Carbonate Fuel Cells (MCFC),
- Solid Oxide Fuel Cells (SOFC) and
- Alkaline Fuel Cells (AFC).

Figure 2 summarizes the typical characteristics of Fuel Cells.

Phosphoric Acid Fuel Cell (PAFC). This type of Fuel Cell can be used in commercial and light industry applications like hospitals, nursing homes, hotels, and utility power plants. The PAFC is the only Fuel Cell commercially available. The system is rated at 200 kW and is fuelled by natural gas. About 170 units have been sold during the period 1995 to 1999. High performance and reliability have been attributed to these units. Efficiency of these units can be improved by utilizing waste heat for co-generation applications. Additional work is required to reduce the cost of these systems when compared with alternative systems.

Polymer Electrolyte Membrane Fuel Cell (PEMFC). This Fuel Cell is also known as the Proton Exchange Membrane Fuel Cell and included in this category is Direct Methanol Fuel Cells (DMFC). These cells are suitable for transport and portable applications, e.g. automobiles, buildings and smaller applications such as camcorders. This cell, as the name suggests, uses an ion exchange membrane as its electrolyte, which is in the form of a solid polymer; platinum electrodes are also used. Like the phosphoric acid cell, pure hydrogen is usually used as the fuel but natural gas and methanol can also be used. Costs for these cells have been reduced in recent times, with a reduction in the quantities of platinum used to make the electrodes. Work on new low-cost membrane technologies aimed at higher performance and increased reliability is now being carried out by Avista Laboratories in the US.

Molten Carbonate Fuel Cells (MCFC). This type of cell is suitable for commercial or light industry applications. The Fuel Cell stack consists of two porous nickel electrodes in contact with a molten salt electrolyte that is made of lithium-potassium carbonate (LiKCO₃).

Technical problems such as corrosion and reliability continue to plague this system. MCFC systems up to 2 MW have been built for demonstration.

Solid Oxide Fuel Cell (SOFC). This type of Fuel Cell is suitable for applications that require large amounts of power such as central electricity generation stations. Larger amounts of power can be achieved by combining a number of smaller units. The central structure of a Solid Oxide Fuel Cell (SOFC) is the Membrane Electrolyte Assembly (MEA) which consists of a thin sheet of a zirconia-based electrolyte coated on both sides with specialized porous ceramic electrode materials. This allows the

Typical characteristics of a Fuel Cell

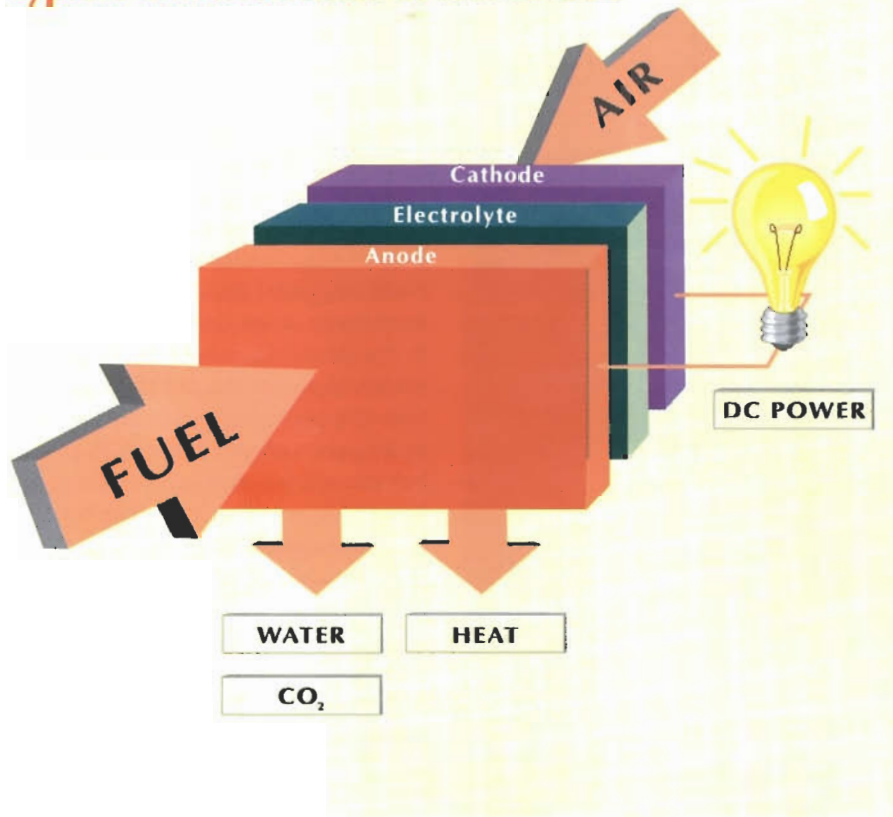


Figure 2: Conversion of chemical energy of a fuel into electricity without combustion, making the Fuel Cell clean and energy-efficient.

cells to operate at high temperatures such as 800-1000° C. The high exhaust temperatures make it particularly suited for combined cycles, producing more energy per unit of fuel and far less carbon dioxide.

The SOFC is said to be one of the cleanest, most efficient power-generating technologies now being developed. The clean environmental performance of SOFCs makes them especially well suited for areas with strict air quality requirements. The all-solid-state composition of these cells is compatible with mass-production processes and offers very low cost in high-volume production.

Alkaline Fuel Cells (AFC). These cells are used in spacecraft and submarines. Currently they are being tested on road vehicles such as

minivans. They use a solution of potassium hydroxide in water as the electrolyte and pure hydrogen as the fuel. Until recently the cost of producing this cell was very high, but several companies are examining ways to reduce costs and improve the operating flexibility of the cell. Some advantages of this cell are good fuel conversion efficiency, relatively long life and potentially low material costs.

POTENTIAL APPLICATIONS FOR FUEL CELLS

The potential applications for Fuel Cells are wide and varied and can be grouped as follows:

(1) Transportation

Fuel Cells can be used to replace internal combustion engines and drive trains in automobiles.

Hence, the vast majority of research in Fuel Cell technology is focused on overcoming the major technical, economic and infrastructure-related hurdles required for the commercialization of Fuel Cell vehicles.

The Fuel Cell that is favoured by researchers is the PEMFC because of its low operating temperatures, compactness and relatively low cost. Hydrogen-fuelled PEMFC has zero emissions and is cheaper to manufacture than other feedstock, e.g. natural gas and methanol, which require reforming to produce hydrogen. However, hydrogen is not easily stored and the compression cost to liquefy or store it as a high-pressure gas is very expensive.

Research on methanol or natural gas as a preferred feedstock for PEMFC has been ongoing. Methanol is currently favoured because of its easy storability (being a liquid) and cheaper conversion of existing service stations from gasoline to methanol. The methanol-fuelled PEMFC now includes a separate reforming process to convert methanol to hydrogen. Hence researchers are currently looking at the Direct Methanol Fuel Cell (DMFC) which will convert methanol directly to hydrogen within the cell, removing the need for a reformer. However, commercialization of this technology is still some way off, with the American Methanol Institute forecasting the year 2008 for commercialization of this Fuel Cell.

Although the PEMFC for use in automobiles is the most advanced in terms of its readiness for the market, it is still not commercially available. Some of the issues which must be resolved include cost, weight and size reduction; fuel storage, condition and delivery; membrane and electrodes with high efficiency and low loading of metal catalyst.

(2) Distributed Generation Power Plant

The potential for reducing site emissions, improving power quality and reliability is expected to be the main driver for growing the demand for Fuel Cells in power generation applications.

PAFC systems running on natural gas are available for sale but at relatively higher cost than conventional co-generation systems. Due to the high operating temperatures, higher efficiencies in electricity generation, and potential lower cost under mass production, researchers are targeting MCFC and SOFC systems for power generation.

In the U.S., electricity demand is forecasted to increase at an unprecedented rate due to retail electricity deregulation. It is expected that this growth will place immense strain on the existing transmission and distribution systems. Expansion of these systems may prove to be expensive and time consuming. Fuel Cell Power Systems could therefore be placed close to the customer site to reduce distribution costs, and near substations to relieve power transmission costs. The heat generated from the Fuel Cell system can be used to produce steam, e.g. for a small factory or electricity generation.

(3) Small applications

To replace batteries for everything from cellular telephones, flashlights, computers, radios, powered wheelchairs etc. This application is the least developed technology but it demonstrates the potential application for Fuel Cells in everyday use.

POTENTIAL FOR USE OF FUEL CELLS LOCALLY

It is clear that it is only a matter of time before Fuel Cells become an important part of our daily life,

“ It is only a matter of time before Fuel Cells become an important part of our daily life just as the battery is now. The applications for the Fuel Cell are limited only by the imagination of the user ”

just as the battery is now. The applications for Fuel Cells are limited only by the imagination of the user. The developed countries, recognizing its huge potential, are devoting a large part of their R&D effort to the development of Fuel Cells. As a gas-producing country, Trinidad and Tobago can benefit from developments in Fuel Cell technology in the following ways:

• INCREASED NATURAL GAS DEMAND

Fuel Cells are expected to increase the domestic demand for natural gas, either directly in natural gas-fuelled Fuel Cells, or indirectly by increased demand for methanol for use mainly in transportation, e.g. automobiles. The use of methanol for Fuel Cells in vehicles is being actively pursued as a possible solution to the expected reduction in demand for methanol consumed in MTBE manufacture.

Nearby Caribbean and Central American countries could be targeted for use of natural gas and methanol in power generation and automobiles.

• ENVIRONMENT

Fortunately, low or zero emissions

from Fuel Cells will reduce the air pollution generated by internal combustion engines.

It is a known fact that the transportation sector generates emissions harmful to the atmosphere, e.g. CO₂, SO₂ and NO_x. In the U.S., the transportation sector contributes over 33% of all carbon dioxide emissions generated. In Trinidad and Tobago, our vehicle population has been steadily increasing, resulting in increased air pollution. Fuel-Cell-powered vehicles can lower these emissions, resulting in a reduction of pollution levels.

Although the development of the Fuel Cell is still some way from commercialization, it is expected that factors such as the numerous potential applications, modular design and efficient utilization will combine to revolutionize the way electricity is used in the 21st century. ■



ERROL MAHABIR: NGC HAS MADE US PROUD

Former Energy Minister Mr. Errol Mahabir visits NGC on the occasion of its 25th Anniversary

The former Minister of Petroleum and Mines, Mr. Errol Mahabir, was the special guest at NGC's Employee Function marking its 25th Anniversary as a corporate entity.

Mr. Mahabir delivered a stirring address, which was very informative, especially for new members of staff who were not very familiar with the early years of NGC's development. NGC's President, Mr. Frank Look Kin, introduced Mr. Mahabir as "my former boss when I was an employee of the Ministry of Petroleum and Mines. Under Mr. Mahabir's tenure as Energy Minister, the conception and birth of NGC, some 25 years ago, took place. He therefore holds a special place in NGC's history".

Gasco is pleased to present to its readers Mr. Mahabir's speech for posterity:

"I wish to thank you most sincerely for having invited me to join you on the occasion of the 25th Anniversary of The National Gas Company of Trinidad and Tobago Limited. Such an anniversary is an important milestone in the life of any organization but when the history of the Company and the crucial role it has played in the economic development of the country are taken into account, then the occasion, as this does, assumes even greater significance.

When I received your President's kind invitation a few days ago, I was abroad on holiday. I therefore spent some time recalling my many years in the Energy Ministry and the circumstances prevailing in our oil and

gas industry in the late 1960s and in the early 1970s and the compelling reasons which led to the establishment of the Company.

As I did so, it dawned on me that I would be addressing employees, none of whom would have been with the Company for 25 years and the majority of whom would have joined the Company after its formative years and may not have a clear idea of its genesis; or they may have been given a distorted picture — always a possibility when people are willing to rewrite history to suit their own agendas. I will therefore give you a brief idea of the events as I

“ All of us in this nation must feel proud of the fact, and your Company must share in the credit, that Trinidad and Tobago has become one of the major gas development centres in the world ”

experienced them, having served as Minister of Petroleum and Mines and Minister of Energy and Energy-based Industries during the period under review.

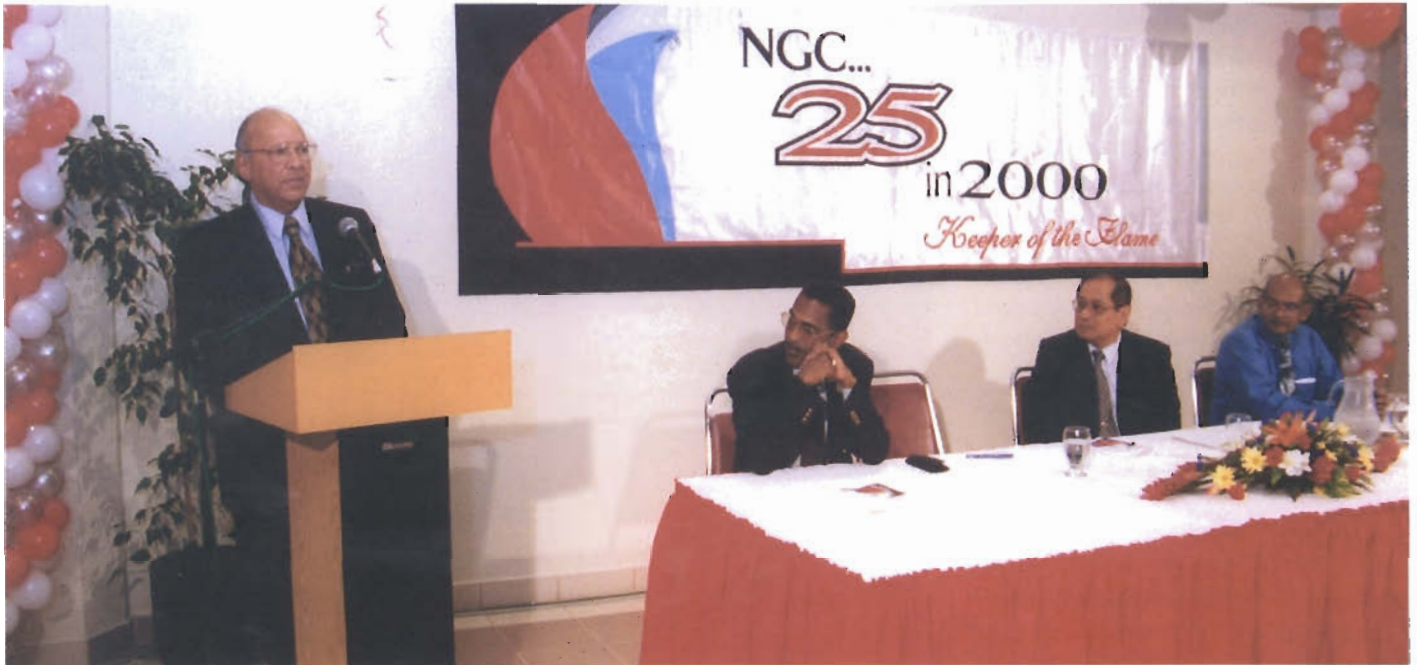
Until the early 1950s, Trinidad and Tobago's oil production came from land operations reaching some 56,000 bpd. In 1954, the companies turned

their attention to offshore fields, producing oil in the shallow waters of the Gulf of Paria. The decade of the sixties marked the start of a new era in crude oil production, as the oil companies looked further offshore for new sources, this time to the Atlantic Ocean. Intense drilling activity off the south-east coast led to significant discoveries of crude oil and associated natural gas which culminated in commercial production. The first major gas find was made in 1968 off the south-east coast of Trinidad. Seismic data, the use of improved technology and subsequent discoveries established the fact that a gas province of great potential existed in the waters of Trinidad and Tobago.

Our Prime Minister, Dr. Eric Williams, was determined to ensure that our energy resources were utilized in the best interests of Trinidad and Tobago to promote industrialization, and to foster social and economic development, a policy which I am happy to note continues to be applied today.

In delivering the 1970 Budget he stated: "The decade of the 1970s begins most propitiously with the prospects of a high level of offshore production of natural gas and low sulphur crude petroleum. There are very few developing countries in the world which begin the decade with such assets. It is for us to utilize these assets for the national benefit, so that by the end of the decade we can look back upon an era of unprecedented economic and social development."

In the early 1970s, the Government



Former Energy Minister Mr. Errol Mahabir addresses the NGC staff body. At the head table from left: Mr. A. Gervais, VP Corporate Services; Mr. F. Look Kin, NGC's President and Mr. Winston Doodnath, Manager Finance.

formulated a new industrialization policy, the goal of which was to replace economic dependence on sugar and other agricultural exports with industrial projects. These projects would necessitate the exploitation of the country's hydrocarbon reserves, particularly the abundant reserves of natural gas, which had been confirmed by companies operating in the marine areas. Remember Dr. Williams' phrase "Here at Point Lisas sugar cane gives way to wire rods."

Natural gas, both as a raw material and as a fuel for gas-based electricity generation, was seen as an important precursor in the massive industrialization programme. The focal point of economic planning during this decade was the establishment of a number of energy-based and energy utilizing industries which would optimize the use of the nation's hydrocarbon resources.

The Government was also concerned about the fact that there was need to attract industries, particularly those utilizing indigenous raw materials, to

the Point Lisas Industrial Estate, which was in the process of being established — the very Point Lisas for which there was no shortage of critics and detractors and which today is a successful world-class industrial complex, with an efficient multipurpose harbour, the centrepiece of our industrial development.

In 1975, a conference, attended by senior representatives of Government Ministries and Statutory Authorities, the domestic and international oil and financial community, the Labour Movement and the University of the West Indies, was convened on "The Best Use of Our Petroleum Resources". This historic and productive conference endorsed the need to use natural gas as a trigger for industrialization and defined a national strategy for optimizing the development and use of these resources.

The growing importance of natural gas led the Government to define certain criteria which would govern its allocation on a priority basis. These included:

1. All projects, regardless of how prestigious and glamorous they appeared, had to be viewed against hard economic facts and market conditions.
2. Natural gas was to be used for the direct benefit of the largest number of people in the country via electricity generation.
3. Natural gas was to be allocated in such a manner as to promote the greatest number of gas-utilizing small industries to promote entrepreneurship and initiative.
4. The establishment of large energy-based industries that would be independently commercially viable had to be vigorously pursued.
5. Gas was to be used to provide maximum revenues, taking into account its true value as a clean source of energy.

It should be noted that we considered LNG, but that was deliberately given low priority at that time so that we could concentrate on projects which allowed for greater value to be added to our gas, and which had the potential for downstream projects.

These were some of the main criteria, which informed Government policy as the country moved to transform and diversify the economy.

Let me give you an idea of what we achieved with electricity generation. In 1973, the installed MegaWatt capacity was 274. By 1977, it had increased to 482 MegaWatts and to 855 MegaWatts by the end of 1979. The enormity of this increase is illustrated by the fact that the 855-MegaWatt capacity was greater than the installed capacity of Jamaica, Barbados, Guyana and the Bahamas put together.

The thrust towards the development of energy-based industries was given impetus in 1974, and again in 1975, when the Prime Minister led ministerial delegations to the United States and the Far East. The delegations met in the United States with the most senior representatives of the oil companies operating in Trinidad and Tobago and emphasized the need for companies which had been benefiting from the petroleum industry in our country to show support for the efforts at developing new industries.

Discussions were also held with representatives of the financial institutions in the various countries visited.

One of the first projects to come into being from Government's new industrialization policy was a joint-venture fertilizer plant to produce 1,200 tonnes of ammonia per day. The plant, 51% owned by the Government and 49% by W. R. Grace, came to be known as Tringen — Trinidad and Tobago Nitrogen Company Ltd. — and was formally opened by Dr. Williams on November 29, 1977.

Later, in one of the visits to the United States on which I accompanied Dr. Williams, we met the President and officials of Standard Oil of Indiana (Amoco).



Mr. Errol Mabahir and Mr. Frank Look Kin at the start of proceedings at the NGC Employee Centre.

We convinced Amoco that, particularly since all the crude oil produced off the east coast was being exported (because of its special qualities it could not profitably be refined in local refineries at the time), they should invest in an ammonia plant. In the company, which came to be known as Fertilizers of Trinidad and Tobago (Fertrin), Government held 51% and Amoco 49%.

In early 1975, Cabinet agreed that a contract should be entered into between the Government or its designated agency and Tringen, relating to the sale of gas to Tringen. Cabinet also approved the principles to be incorporated into a contract between the Government or its designated agency and Amoco, relating to the purchase of gas from Amoco.

It was decided that the contracts should be between the companies and an agency to be designated for that purpose. Four alternatives were considered. They were:

1. National Petroleum
2. Trintoc
3. T&TEC.

4. A new company

The first three were ruled out for a variety of reasons and Cabinet, in March 1975, agreed that a new company, to be called The National Gas Company of Trinidad and Tobago Limited (NGC), should be formed and be the designated agency of Government for the purchasing and selling of natural gas in the country to commercial and industrial users. This was an important, far-reaching decision which put NGC in a position to play a vital role in the industrial development of the country, particularly in the use, allocation and pricing of gas. Of course, there were those then, and apparently some of them are still among us, who would have preferred to see NGC confined to the role of ownership of a distribution system.

It is interesting to note what Dr. Williams had to say at the formal opening about the supply of gas to the plant. "Eighteen years ago, the supply of natural gas to the plant was negotiated between W. R. Grace and a transnational company, with little or no reference to the Government.

For the Tringen Project, negotiations took place between Tringen and the Government who owns the gas and the transmission facilities which bring the gas to the plant.”

In August 1975, 25 years ago, Cabinet agreed that the composition of the first Board of Directors of NGC would be as follows:

Mr. Ben Primus

- Chairman

Dr. Kenneth S. Julien

- Deputy Chairman

Mr. Eldon Warner

- General Manager of I.D.C.

Mr. Sam Martin

- Economist, Ministry of Finance

Mr. Knollys Ahloy

- Gas Engineer, TTEC

Mr. Basharat Ali

- Chemical Engineer,
Ministry of Petroleum and Mines

Mrs. Kamla Bholai

- Senior State Counsel,
Ministry of Petroleum and Mines

It was some time before NGC was able to put in place the necessary technical staff, and a great deal of the initial work fell on the members of the Board, particularly on Dr. K. Julien and Mr. E. Warner and the public servants.

It is to the enduring credit of all those who have served this Company at every level over the years, including each and every one of you here today, that the Company has not only successfully discharged its original mandate but, having absorbed the National Energy Corporation, holds today a diversified equity investment portfolio in such companies as Atlantic LNG (10%), Phoenix Park Gas Processors (51%) and 20% interest in Trintomar, among others. Significantly, NGC has also successfully assumed the role of promoter in the establishment of gas-based industries, a role previously performed by government ministries.

We, all of us in this nation, must feel

proud of the fact and your Company must share in the credit that Trinidad and Tobago has become one of the major gas development centres in the world, meeting the criteria set out by the Government in 1975 to transform and diversify the economy.

Trinidad and Tobago is a leading exporter of ammonia and methanol, and has a well-established steel industry. Moreover, the country is now on the world map for LNG trade. NGC is currently focusing its efforts at taking the value of natural gas further downstream by seeking to establish an Ethylene Petrochemicals Complex, an Aluminium Smelter and Gas-to-Liquids project. The tree planted 25 years ago and carefully nurtured since then has truly grown, blossomed and borne fruit abundantly!

Meanwhile, through the use of technological innovations and advances, and venturing into water depths of 500 feet, not the less-than-200 feet of yesteryear, more and more sources of natural gas are being discovered. Today, 4D seismic modelling techniques using computers are being developed to help producers locate new oil and gas reserves and expand production from existing fields. Diamond coating of bits is making it easier to drill deeper, cheaper and faster.

Also, the energy market is experiencing an aggressive demand for natural gas in all applications, especially since consumers are being accustomed to its environmental advantages, efficiency and competitive price.

The demand is so great that the U.S. Department of Energy has estimated that “by 2015 natural gas use will rise at more than three times the rate for oil use, with an expected incremental gain in annual gas use of 66 Trillion Cubic Feet”. It has stated further that “the growth in natural gas consumption is

equivalent to more than 33 million barrels of oil a day. In comparison, oil use in 2015 is projected to be 35 million barrels of oil per day higher than it was in 1995.”

Put simply, natural gas consumption is expected to grow at 3.1% a year, the highest among fossil fuels. This is a lot of gas, and where there is a demand, Trinidad and Tobago has a role to play, a role in which NGC will figure prominently.

As we reflect upon the past 25 years, I hope that you will find that in the 1970s the Government sought to use good economic management to improve the performance of the economy and to overcome the diversity of problems which beset all nations, particularly the developing countries. It is this diversity which makes development, and particularly the practical problems of development, so challenging and stimulating.

Yes, as in the case of every country in the world, a review of policies which it adopted over the years will reveal that Trinidad and Tobago made errors — errors of judgement, errors in setting priorities and errors in emphasis.

It is always possible with hindsight to see things much clearer. But progress is based on foresight not hindsight. In the exercise of such foresight we need to take account of all the information available, much of which is inevitably contradictory. But, at the end of the day each of us has to exercise judgement, take a decision and go forward.

As one who was involved in the conception, birth and early development of The National Gas Company, I feel proud of its achievements over the past 25 years. I have every confidence that, as it faces new and increasing challenges in the future, NGC will rise to the occasion and make us exceedingly proud.”

NGC celebrates 25th Anniversary of Operations as 'Keeper of the Flame'

On August 22, NGC marked its 25th year of incorporation as a corporate entity. This special day was celebrated by a gathering of Management and Staff at the Employee Centre, Head Office. The theme of the birthday celebrations was "Keeper of the Flame", in keeping with NGC's mandate to be "the prime mover" or facilitator of gas-based development in the country. A number of events have been planned, including:

- A photographic display, highlighting the history of the natural gas industry in Trinidad and Tobago
- The commissioning of a publication on the history of the natural gas industry in Trinidad and Tobago

Representatives of each of the three major religious groups in the country — Christians, Hindus and Muslims — offered prayers and thanksgiving for NGC's successes over the past 25 years and expressed, too, the conviction that the company would continue to be a leader in the local energy sector.

Like birthdays of yesteryear, there was an address by NGC's President, Mr. Frank Look Kin. Some excerpts are reprinted for Gasco News readers:

"My fellow employees, if we were to go back, we will see that in 1975



NGC's President Mr. Frank Look Kin addresses the NGC employee body at the 25th Anniversary Celebration.

few could have envisaged the NGC of today, and the important and strategic role the gas-based sector would play in the country's economic development. In fact, although NGC's Articles of Association envisioned an important role for the Company at the centre of the natural gas industry, its sole responsibility at its formation was to manage the gas contract between the Government and Amoco for a supply of gas to T&TEC.

Gas sales volume has increased almost 9% per year throughout our history. Today, NGC is selling seven times the volume sold in 1978. We have been very successful at attaining global stature and recognition for Trinidad and Tobago as a player in the natural gas business. Today, T&T is the global leader in the export of ammonia and methanol — over three million tonnes per year. Today, T&T is a large exporter of steel and reduced iron. The country is exporting over 3 million tonnes per year of LNG to the USA and Europe.

Over the past 25 years, NGC has sold 3.6 TCF of gas from which it has contributed approximately \$2.8 billion to the Treasury as dividends and taxes. Dividends paid from 1991 to present are TT\$743 million. Through the development of the gas industry, the Government has earned increased revenues of some \$8.4 billion from natural gas, associated condensate and natural gas liquids production over the 25-year period.

It is clear, therefore, that NGC's future role will not be predicated on how it conducted its affairs in the past. In the first place, while there was only one main supplier of natural gas in 1975, today there are three suppliers. Future discoveries from new offshore acreage may well change the offshore producing environment, leading to competition between producers in a scenario where the gas-consuming market will become more demanding. Secondly, there will be competition to determine the products into which natural gas will be utilized — export LNG, ammonia, methanol, electricity for metal production or Gas-to-Liquids.

We will continue to be challenged by being the middleman in the business. With the increasing maturity of the natural gas industry, NGC will seek to change its risk profile in the sale of natural gas by requiring gas producers to accept a greater share of that market risk. What is increasingly obvious is that the magnitude of the risk borne by NGC must be balanced so that both the upstream producers and downstream consumers share with NGC the benefits of the upside market prices as well as the pains during the down cycle.

It is, however, likely that NGC will no longer be solely responsible for bringing new investments into the gas sector. This will be shared with

gas producers. NGC will seek to facilitate and manage the gas developments to meet the needs of the market. Therefore it will be necessary for NGC to expand its transmission system to meet new investment requirements in the sector.

In this regard, it is necessary for NGC to deepen its presence in key positions along the chain, ensuring that the industry continues to develop along the road of diversification where new and expanded opportunities for business and job creation can filter into the wider economy. Moreover, as “Keeper of the Flame”, NGC’s vision is to maintain its prominence in the sector, ensuring that no one player — either on the producer side or the consumer side — dominates or controls the industry at the expense of the country.”

NGC makes investment in LNG 2 and 3

At the recent function marking NGC’s 25th Anniversary, Mr. Frank Look Kin, NGC’s President, told staff members that “while we are cautious about further LNG development in the country, NGC will be participating as an investor in the Atlantic LNG Trains 2 and 3 where slightly over 50% of the country’s gas production will be leaving Trinidad and Tobago in the form of LNG”.

Mr. Look Kin also said that it was critical for NGC, as a state enterprise, to participate in LNG in order to look after the interests of the country. He also added that on top of the company’s 10%

shareholding in Atlantic LNG’s Train 1, the capital expenditure of approximately US\$110 million would be required for a 10% share in the two expanded trains.

SP IV is launched

The National Energy Corporation of Trinidad and Tobago Limited (NEC), a wholly-owned subsidiary of NGC, formally opened its US\$22.3 million Savonetta Pier No. IV on August 4, 2000. Present at the gathering were the Honourable Prime Minister, Mr. Basdeo Panday; Minister in the Office of the Prime Minister, Senator Lindsay Gillette; Mr. Kenneth Birchwood, NEC’s Chairman, and Mr. Prakash Saith, NEC’s General Manager.

NEC’s Chairman, Mr. Kenneth Birchwood, told the gathering that NEC had been instrumental in the development of the Point Lisas Industrial Estate. He said that in NEC’s early years it was responsible for the development of the first gas-based industries at Point Lisas, and later as a subsidiary of NGC its

current focus was to develop a new industrial estate and related marine facilities south of the Point Lisas Industrial Estate. To this end, he said that NEC/NGC and Caroni were involved in discussions, since 600 hectares of land belonging to Caroni had been identified as suitable for industrial use.

In fact, Mr. Birchwood said that since the existing estate at Point Lisas was fast approaching maximum utilization, it was imperative that the lands be prepared. The NEC Chairman added that SP IV’s sister piers had facilitated the export and import of an estimated 10.3 million tonnes of petrochemical and steel products annually.

NEC’s General Manager, Mr. Prakash Saith, addressed the gathering. He listed the technical features of the new pier, highlighting that it was equipped with state-of-the-art safety features and utilities. Mr. Saith also said that this provision of an integrated package of marine assets was critical in attracting new gas-based industries to Trinidad, and he reiterated that the company’s success had transformed NEC into a strong and stable enterprise.



The Honourable Basdeo Panday, Prime Minister, cuts ribbon at the formal opening of Savonetta Pier IV. From left to right: Shabzaad Mohammed, Head, Capital Investments NEC; Senator Lindsay Gillette, Minister in the Office of the Prime Minister; Prakash Saith, General Manager of NEC; Prime Minister Basdeo Panday; Kenneth Birchwood, Chairman of NEC; and Haydu Jones, Supervisor, Marine Terminals.



Mr. James Trim, NGC's Head, Environment, Safety and Security and Coordinator of the Emergency Response Exercise in Port of Spain.

Nitrogen. PCS, which has shut down two of its four ammonia plants at Point Lisas, said in a press release that it intended to restart to full operating capacity by July 1. The two plants, which have a combined capacity of 80,000 tonnes a month, went out of operation when the old contract between NGC and PCS expired on December 31, 1999.

While the details of the contract are confidential, PCS said the contract improved its cost position and made it more competitive on a global basis.

respect to the programming and configuring of equipment and the customization of software. The Factory Acceptance Test (FAT) on all radio equipment has been successfully completed. FAT has been completed on equipment for the BCC, the Programmable Logic Controllers (PLCs) and the PLC integrated FAT. The entire system is expected to be ready for testing by February 2001.

Update on SCADA

NGC's Engineering Division has reported that, as of October, its DataFlow Project or SCADA was approximately 70% complete, with construction currently in progress at a number of locations. Construction works at the Master Control Centre (MCC), located at NGC's Warehouse Complex, and the Backup Control Centre (BCC), located upstairs of NGC's Head Office, are now nearing completion. Both locations will soon be ready for the installation of control equipment (workstations, UPS, radios etc.)

Also, other work directly managed by NGC is in progress at a number of consumer and valve stations. These include civil work modifications to the stations, piping modifications (including hot taps) and construction of shelters to house the equipment.

Work managed by NGC's main contractor, SAINCO, is also in progress at a number of field locations. These include the installation of actuators on selected valves, installation of telecommunication masts and other general electrical and instrumentation works.

Moreover, while field construction is in progress, work is proceeding with

NGC pays dividend to government

While retaining sufficient funds to carry out its operations and maintain the viability of the company without having to rely on Government's support, NGC paid the Government of Trinidad and Tobago an interim dividend of TT\$50 million for the year 2000. Since 1993, total dividends paid by NGC have amounted to TT\$750.2 million. ■

NGC/PowerGen stage Emergency Exercise

On August 24, NGC, along with PowerGen, mounted a full-scale Emergency Response Exercise at PowerGen's electricity generating facility in Port of Spain. The exercise brought together key emergency response players in the country, testing the companies' preparedness for dealing with emergencies.

NGC, PCS Nitrogen sign new contract

NGC announced that it had signed a new natural gas sales contract with PCS

EOG makes gas discovery in Osprey Field

In July, Enron Oil and Gas (EOG) Resources Managing Director Mr. Lindell Looger announced that his company had found significant gas in its offshore Osprey Gas Field located 20 km east of Mayaro. Mr. Looger was speaking from the Soca Samba ferry which had taken him to see the arrival of the Labrador 1 drilling rig from Chile. EOG said that the initial capital outlay for exploration and plant investment could reach US\$25 million.

It is estimated that the Osprey Field could have reserves of more than 1 TCF and a lifespan of up to 20 years, but EOG intends to explore deeper to discover the field's full potential.

The Osprey gas find is of special interest for the continued development of the local market. The gas has been earmarked for use as feedstock in Caribbean Nitrogen's 1,860 metric-tonnes-per-day ammonia plant, scheduled to be completed in 2002. EOG is also a shareholder in the plant.

BHP makes new gas find

In June, Broken Hill Proprietary (BHP) Petroleum Trinidad Limited announced it had made a second gas find in its 51,000-hectare Block 2 (c), which is located off the north-east coast of Trinidad. Mr. Nicholas De Verteuil, Vice President, BHP Trinidad, said the latest discovery, the Aripo 1 well, was located 40 km off the east coast of Trinidad.

BP and Repsol new gas find

BP and Repsol recently announced that they had made a major new deep-water natural gas find off the south-east coast of Trinidad.

The find, estimated to be 2 TCF, was made from Manakin 1 exploration well in Block 5 (b) at a depth of 730 feet. The gas reservoir adjoins the Trinidad-Venezuela boundary line.

According to Larry Tiezzi, President of the BP Exploration Business Unit, "the find reinforces Trinidad and Tobago as a world class hydrocarbon province".

Rich gas find in 'Red Mango' Exploration Well

BP announced in September that it had made the largest single discovery of natural gas in the history of Trinidad and Tobago with the discovery of around 3 TCF of natural gas in the Red Mango exploration well, which is located 35 miles east of Galeota Point. The discovery is BP's second major gas find for the year and its fourth in the last three years.



BP installation off the south-east coast of Trinidad.

British Gas bids on offshore blocks

In the Ministry of Energy's recent bid round which closed on March 31, British Gas (BG) was the company most interested in the five blocks offered. BG, in conjunction with other companies, bid on four of the five blocks, that is BG in joint venture with Veba of Germany for Blocks 1(a) and 1(b); in consortium with BHP of Australia and Talisman of Canada for Blocks 3(a) and 3(b). CL Financial, a local conglomerate, made a bid for the fifth block, Modified U(b), while state-owned Petrotrin made its bid for Block 1(a).

Phoenix Park achieves award

Phoenix Park Gas Processors Limited (PPGPL) won first place at the annual Gas Processors Association (GPA) Safety Award ceremony held in Atlanta, USA, in May.

PPGPL competed with companies from the Far East, the Middle East, Europe and the Americas which had completed between 101,000 and 500,000 hours of work without injury to employees.

In a statement from the company, PPGPL's Managing Director John Wright said the award was evidence that PPGPL was a world-class performer in the field of safety. He acknowledged the commitment of all employees to the safety process.

Mr. Stephen Harris, PPGPL's Safety,

Health and Environment Manager, also said that his company continued to display safety leadership in a dynamic and growing industry that was faced with many challenges. Mr. Harris added that PPGPL was close to completing eight years without "lost-time-injury".

PPGPL is a subsidiary company within the NGC Group of Companies.

T&T hosts Latin American Methanol Conference



Overhead of Methanol Plant at Pt. Lisas Industrial Estate.

Trinidad and Tobago hosted over 200 international delegates at the 5th Latin American Methanol Conference in May. The conference was the third to be hosted in this country.

At the opening, the Honourable Prime Minister, Mr. Basdeo Panday, made the point that over the years the energy sector had fuelled unprecedented growth in

infrastructure, services, benefits and opportunities, so much so that the sector now employed 19,000 people directly.

Moreover, he said that, because of energy sector support for the National Energy Skills Center, more than 1,100 graduates had been trained in energy-related skills and 10,000 in its computer literacy programme.

Also speaking at the conference was Senator Finbar Gangar, the Honourable Minister of Energy and Energy Industries, who said that the phasing out of the use of fuel additives (MTBE), because of health concerns, hung over the methanol industry, dampening its prospects. He said that since methanol was one of the key ingredients used in the manufacture of MTBE, the phasing out scenario would be a serious blow

for the industry.

The Minister said that about 30% of this country's methanol went into MTBE production and the future would rely heavily on methanol finding a new market. He said that the prospects for growth lay in the usage of Fuel Cell technology and olefins, which are expected to take off in the coming years.

New methanol plant next year

Plans are proceeding for the construction of Trinidad and Tobago's sixth methanol plant at Point Lisas. The plant, which will have a design capacity of 5,000 metric tonnes per day, will be outfitted with Lurgi technology.

Construction of the new plant, to be called Atlas Methanol, will start by the end of the first quarter of 2001.

Venezuelan cooperation a possibility

At the recently hosted 5th Latin American Methanol Conference, the Honourable Prime Minister, Mr. Basdeo Panday, and Energy Minister Senator Finbar Gangar said that government intended to seek Venezuela's cooperation in exploiting the natural gas reserves that adjoin this country's boundary line with the South American republic. Senator Gangar identified three prospective and viable marine locations – two located off the south-east coast and one in the north-west. These locations straddle the maritime boundary line between the two countries.

The Minister explained that Trinidad and Tobago's long-term vision to utilize the large, unused gas reserves close to the border with Venezuela could complement and create a significant LNG hub at Point Fortin.



Titan Methanol Company, Pt. Lisas Industrial Estate.

Iron plant closes

In June, joint venture partners Cleveland Cliffs, LTV Corporation and Lurgi AG confirmed they had closed their Cliffs Iron Briquette plant located at the Point Lisas Industrial Estate. This development meant that the Cliffs and Associates (CAL) plant would be two years behind production schedule as it should have been producing since the fourth quarter of 1998. Company officials said that the plant would be down for an additional eight months so that a feasibility study and analysis could be conducted on the facility's production unit.

The company is said to have faced consistent mechanical difficulties in getting its iron ore feedstock through the discharge system and into its briquetting machine. These

difficulties have escalated construction costs from US\$150 million to approximately US\$168 million.

Titan on stream

Titan Methanol, the country's fifth methanol plant located at Point Lisas, has reported that it is in full production. On September 3, Titan said it had passed its performance tests during which it ran at 103% of its design capacity. Acceptance of the plant came 36 months after the Engineering Procurement and Commissioning contract went into effect. The lack of an oxygen supply that was to have been purchased over the fence from an adjacent plant was the main cause for the delays experienced by the plant after mechanical completion in December 1999. Titan has a production capacity of 2,500 metric tonnes of methanol per day and is owned by BP, Beacon Investment Fund and Saturn Methanol.

GTLs plant for Trinidad

It was reported in June that REEMA International Corporation started basic design and engineering work on a GTLs plant to be located in Trinidad. It is reported that the plant will convert 100 MMscf/d of natural gas into 10,000 bp/d of diesel, jet fuels, naphtha and other speciality products.

Moreover, NGC is currently in discussion with several other companies involved in the GTLs technology, including Shell, Syntroleum and Sasol. In September, Mr. Charles Baisden, NGC's Manager, Project Development, attending SMI's GTLs Conference in London, said that the country did not wish to only monetize its stranded gas by going into LNG as a sole option, but also to implement a GTLs plant where benefits would redound to the country. According to Mr. Baisden, the potential benefits included higher value-added downstream products than LNG, utilization of local oil and refinery infrastructure, replacement for dwindling oil reserves, and production of speciality products with a much larger global market than petrochemicals and LNG.

New appointments in the Energy Sector

Over the past six months there have been a number of new appointments in the energy sector in Trinidad and Tobago. In May, Mr. John Andrews, a former Permanent Secretary to the Prime

Minister and Head of the Public Service, was appointed Chairman of Atlantic LNG. He replaced outgoing Chairman, Mr. Martin Houston, the former General Manager of BG, Trinidad.

In August, BP Trinidad announced the appointment of Mr. Robert Riley as its new Associate President. Mr Riley, the former Vice President, West Business Unit, is the first Trinidadian to head the company, replacing Mr. David Wight who had been transferred to head a BP affiliate company in Alaska.

In October, the Power Generation Company of Trinidad and Tobago (PowerGen) announced the appointment of a new General Manager, Mr. J. Garth Chatoor, as PowerGen's first local in that company's top executive post.

Also announced was the appointment of Mr. David D'Andrade as President of Farmland/MissChem, one of the eight ammonia plants located at Point Lisas.

LNG shipment for Puerto Rico

Cabot LNG, one of the partners in Trinidad's LNG Train 1, recently announced it had made its first delivery of LNG to Puerto Rico's first Independent Power Plant (IPP) and LNG Receiving Terminal, the EcoElectrica facility, under a 20-year agreement.

The facility, located near the city of Ponce, is a 507 MW natural gas power plant, which would generate as much as 20% of that country's electrical demand. The complex includes not only the power plant, but also a state-of-the-art LNG import terminal with 3.8 billion cubic feet of storage and a plant for desalinating water.

T&T set to be LNG hub

At the Society of Gas Tankers and Terminal Operators (SIGTTO) meeting held in September, the Energy Minister, Senator Finbar Gangar, said that a natural gas alliance between Venezuela and Trinidad and Tobago could create a major force in the LNG industry.

The Minister spoke of integrating the local LNG industry with Latin American energy markets and said there was a possibility for the creation of an LNG hub in the country. He added that there were plans to step up natural gas production by drilling nine new wells in the year 2001 and reviewing the non-associated gas reserves in the country. ■

One
Moment
Please



Green Iguana (*Iguana iguana*)

This fascinating species, with its bright green, soft, leathery scales, is one of the most attractive reptiles native to Trinidad and Tobago. Also one of the largest, it can grow to up to seven feet long. The Green Iguana ranges from Central to South America, including some of the West Indian islands. In the wild, iguanas eat mostly leaves and flowers, though they occasionally swallow insects hiding in the plants they prefer! Iguanas are social reptiles, basking and foraging in groups. Their main habitat is the leafy lower level of the rainforest, though deforestation often drives them into built-up areas, and they are not an uncommon sight on suburban lawns in Trinidad and Tobago.

Iguanas are wonderful swimmers. They use their tails to propel them through the water, and though they cannot breathe underwater they can hold their breaths and remain submerged for up to 30 minutes. The Iguana's only predator is man, and in fact hunting for food has put these big lizards on the "threatened" list.

Photo by Mark Meredith



**THE NATIONAL GAS COMPANY
OF TRINIDAD AND TOBAGO LIMITED**

The power of two. NGC and YOU®

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