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# **COMPETITION IN ENERGY MARKETS: TRINIDAD AND TOBAGO CASE STUDY**

**PROJECT: COMPETITION IN ENERGY MARKETS**

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## Glossary of Abbreviations.

ALNG – Atlantic LNG Company.  
BP – British Petroleum  
ECMA – East Coast Marine Area  
IMF – International Monetary Fund  
LNG – Liquefied Natural Gas  
MCF – Thousand Standard Cubic Feet.  
MEEI – Ministry of Energy and Energy Industries  
MMBOE – Million Barrels of Oil Equivalent.  
MMCF – Million Standard Cubic Feet.  
MOPM – Ministry of Petroleum and Mines  
NCMA- North Coast Marine Area  
NEC – National Energy Corporation  
NGC – National Gas Company of Trinidad and Tobago Limited  
NPMC or NP – National Petroleum Marketing Company  
OPEC – Organization of Petroleum Exporting Countries.  
PETROTRIN - Petroleum Company of Trinidad and Tobago  
PowerGen – Power Generation Company of Trinidad and Tobago.  
PPGPL – Phoenix Park Gas Processors Limited.  
PPT – Petroleum Profits Tax  
PSC – Production Sharing Contract.  
RIC – Regulated Industries Commission  
RMC - Retail Marketing Contract  
T&TEC – Trinidad and Tobago Electricity Commission  
TCF – Trillion-Standard Cubic Feet  
UBOT – United British Oilfields  
UNIPET – United Independent Petroleum Marketing Company Ltd

# COMPETITION IN ENERGY MARKETS

## TRINIDAD AND TOBAGO CASE STUDY

### 1 Introduction

This study is part of a hemisphere wide project on Energy and Sustainable Energy Development undertaken by OLADE / University of Calgary and funded by the Canadian International Development Agency (CIDA). The goal of the Project is to enhance policy making of OLADE member countries in the areas of rural energy, energy markets, and climate change among other issues. More specifically, the study is one of four country case studies which forms part two of the wider project. The objective of the case studies is to provide an analysis of the operational experience of the study countries with national energy markets liberalization. The case study countries are: Trinidad and Tobago, Brazil, Chile and Peru.

The approach to this project recognizes that Trinidad and Tobago is uniquely featured among the four countries, as the only island and the only net energy exporter. Additional characteristics impacting on market liberalization include the market size, structure of upstream energy supply, structure of market demand and Government's fiscal policy. Trinidad and Tobago embraced the free market economic philosophy, while under the influence of the multilateral lending institutions in the late eighties. In the 1990's, Government identified several policy initiatives aimed at introducing competition in markets for power generation and transportation fuels. However, progress in the last fifteen years has been slow, at best, in part due to changed economic circumstances and the unique characteristics of this energy surplus economy.

## **1.1 Objectives of Study**

The objectives of the study are the following:

1. To provide an overview of the energy markets in Trinidad and Tobago.
2. To analyze how the distinguishing features of the market have impacted imperatives of and approach taken towards liberalization policy formulation and implementation.
3. To provide an account by sector of what has been accomplished with respect to liberalization.
4. To distill lessons learnt from the Trinidad and Tobago experience.

## **1.2 Scope of Study**

An outline of the major sections of the study is provided hereafter:

- i. Overview of the Energy Sector:** This introductory section will provide a high level description of the history growth and structure of the energy sector in Trinidad and Tobago. Important elements in this section will be the major transition points and the drivers behind those changes. The study will examine the development of the energy sector in three periods :
  - a. The early years to 1972.
  - b. Boom and bust: 1973 – 1992.
  - c. The modern era, 1993 to present.
  
- ii. The Context for Market Liberalization** This section will provide details of the wider economic, political and social context that informed initiatives to introduce competition into energy markets. The research here involved examination of policy documents and interviews with key policy makers and operatives in the energy sector. Interviews sought to uncover the main drivers behind competition initiatives in the early nineties, and the factors which have influenced the apparent withdrawal from initial objectives.

**iii. Market Liberalization Experience** This section analyses the country experience with market liberalization. It would cover three key sectors of relevance to the Trinidad and Tobago context :

- a. **Power Generation**
- b. **Transportation Fuels, and**
- c. **Natural Gas**

For each sector the study examines the policy objectives and context, the implementation record and the impact. In the latter area, the study will examine issues such as competition, pricing, private participation, local and foreign involvement.

**iv. The Future:** This section attempts to distill the likely course of events in Trinidad and Tobago with respect to the market segments identified. It draws from the interviews with industry practitioners and well as Government officials.

**v. Lessons of Experience.** Recognizing the unique position of Trinidad and Tobago among the case study countries and within OLADE, this section focuses on the key lessons learnt over the period.



## **2 Overview of Energy Sector**

### ***2.1 Historical Antecedents.***

Trinidad and Tobago boasts of having one of the oldest oil industries in the world. The first oil well was drilled in 1857 in the vicinity of Pitch Lake in La Brea. This was two years before Drake's discovery of oil in Pennsylvania, USA, marked the beginning of the modern oil industry. In 1866, Walter Darwant made the first oil discovery in Trinidad, but commercial production did not begin until 1908. The first shipments of crude oil were made in 1913. Electricity use began in 1886, 20 years after first oil discovery, when a group of business men was granted a twenty year franchise to run an electrical power station and tramway system in Port of Spain. The petroleum industry – first oil and lately gas – has dominated the economy of Trinidad and Tobago since the beginning of the twentieth century. Although Trinidad and Tobago is a small player in the international oil market, producing less than 1% of world output, over the last thirty years the country has risen from relative obscurity to be listed among the world's leading exporters of ammonia, methanol and LNG. The sector remains a significant contributor to the economy as a source of foreign exchange, government revenue and a major contributor to Gross Domestic Product. This brief overview of the sector's development may be divided into three eras - early years to 1972; 1973 to 1992; and the modern era - 1993 to present.

### ***2.2 Early Years to 1972***

In this period, the industry was characterized by the almost exclusive investment of foreign multinational firms. Crude production increased rapidly in the early years of the industry, reaching ten million barrels in 1930. This increase continued throughout the decade but production stagnated during the Second World War, when a severe capital shortage prevented the development of new fields.

Oil refining in Trinidad and Tobago also commenced in the first decade after commercial discovery. Historically, oil refining has been the basis for Trinidad and Tobago's importance in the international oil business. The first refineries in Trinidad and Tobago were set up by Trinidad Leaseholds Ltd. in 1912 at Pointe-a-Pierre and by United British Oilfields of Trinidad (U.B.O.T.) in 1913 at Point Fortin. Even from the early years, refining capacity outstripped local production by a large margin and there was a need to import crude to keep refineries operating at capacity.

In 1956, the Pointe-a-Pierre refinery was taken over by Texaco Trinidad Incorporated. Shortly afterwards, a lubricating oils plant and a normal paraffin unit were added. Shell also expanded and improved capacity at Point Fortin, resulting in an overall expansion of the sector during the 1960's, and Trinidad's emergence as a major refining center in the network of the multinational corporations. Despite these expansions, in 1972, the output of the refining sector was heavily biased toward residual fuel oil targeted at markets in the Eastern seaboard of the USA.

During the fifties, the upstream business picked up once again with increased drilling and exploration activity. In 1952, initial steps were taken for the development of offshore resources. Marine drilling commenced in the South West marine area in 1954. Commercial discoveries were made one year later, in 1955; bring with it the country's first "oil boom". Although land production stagnated after 1960, steady growth in total production was maintained due to incremental supplies from marine production. During the years 1966-1968, there was a dramatic increase in oil production from 48.8 million barrels to a peak of 66.9 million barrels. Production subsequently declined after the peak of 1968 as existing marine fields reached a plateau and as land production fell. However, new marine discoveries off the East coast arrested this decline, when Amoco began commercial production in 1972.

Although natural gas production on a commercial basis began in 1940, the first significant use of natural gas outside of the oilfields occurred in the 1950's. Natural gas was used for power generation at the Penal Power Plant in 1953. In 1959, Federation

Chemicals Ltd. pioneered the use of natural gas as a chemical feedstock in the manufacture of ammonia in Trinidad. In 1963, the Port of Spain Power Station was commissioned utilizing natural gas as fuel.

The electricity industry which began as a private business was taken over fully by Government in 1945, with the passage of the Trinidad and Tobago Electricity Commission Ordinance No. 42 of 1945. The Act set up the utility as a statutory Board – The Trinidad and Tobago Electricity Commission – and mandated it to embark on universal distribution of electricity. The Commission had exclusive responsibility for the design, construction, operation and maintenance of Trinidad and Tobago’s electrical transmission and distribution network. By 1964, the number of customers on supply increased to nearly 100,000.

### ***2.3 Boom and Bust 1973-1992***

In this period the industry experienced extremes of economic activity moving from boom to bust. It was a period characterized by rising output and prices of crude oil, the withdrawal of the transnational companies and heavy state investment in the natural gas downstream sector as a deliberate economic development strategy.

Following the commencement of production off the East Coast of the island in 1972, crude oil production increased steadily over a six year period to peak again in 1978 at 83.7 million barrels. Production declined thereafter as existing fields became mature and no new fields were added. Moreover, both the Government and the producing companies shifted emphasis to gas. The dramatic increase in oil prices at the start of the oil crisis in 1973/74 prompted some strategic moves in the industry on the part of both Government and oil companies. Multinationals began restructuring their global operations partly as a result of changing markets but more so in response to pressure from host Governments of oil exporting countries.

The T&T Government had indicated its intent to get greater control of the “commanding heights of the economy”. On August 31<sup>st</sup> 1974, the Trinidad and Tobago government

officially acquired the assets of Shell Trinidad Limited, to form the Trinidad and Tobago Oil Company (Trintoc). As early as 1969, Government in a joint venture with Tesoro Corporation had purchased the assets of a departing British Petroleum to form Trinidad Tesoro. That company's retail distribution network formed the basis for the creation of National Petroleum Marketing Company Limited (NP) in 1972. NP became a monopoly supplier of transportation fuels in the country.

The most significant changes took place in the emerging natural gas sub-sector. Discovery of substantial quantities of natural gas in the East and North Coast marine areas in the early 1970's, combined with the substantial increase in Government revenue from the quadrupling of oil prices ushered in a new phase of industrialization in Trinidad and Tobago. The Government embarked on a deliberate strategy of resource-based industrialization to exploit natural gas resources. The centerpiece of the programme was the creation of the Point Lisas Industrial Estate, which was to become the home of the country's gas-based industrialization activity.

In 1975, Government established the National Gas Company of Trinidad and Tobago Ltd. (NGC), with the sole responsibility for the purchase, sale and transportation of natural gas. The state, through the National Energy Corporation, invested in and managed several energy-based projects located at Point Lisas. Over the period 1979 to 1984, the slate of new plants included iron and steel, ammonia, urea, methanol and additional power generation. Two cross-country natural gas pipelines and port and multipurpose pier facilities at Point Lisas were built as integral parts of the gas driven industrial infrastructure.

Significant expansion also took place in the power generation sector to support the industrialization thrust. The Point Lisas Power station was opened in 1977, and nine new gas turbines were commissioned at that station with the next four years. Capacity was also boosted by the addition of new turbines installed at Penal and Port of Spain.

Amidst a collapsing oil market, Government purchased the assets of Texaco Trinidad Inc., including the large Point-a-Pierre Refinery in 1984. The acquisition brought the two refineries, substantial land and marine acreage under the umbrella of a single company, Trintoc. In 1986, Government completed the process of full state ownership of land-based oil companies with the acquisition of Tesoro's shares in Trinidad Tesoro to form Trintopec. The state companies were merged in 1993 to form Petrotrin, with the state retaining 100% control.

Strapped for cash in the economic downturn, Government shelved many of its plans for further downstream expansion. In fact, the latter years of this period witnessed three significant developments, none of which required direct state funding. Firstly, the state-owned oil companies offered underutilized or marginal acreage to small companies on a lease-operator-ship and farm-out programme. More significantly, the state-owned companies also formed a joint venture, Trintomar, to conduct exploration and production activity in the southeast marine area. After initial success, production declined as a result of a well accident. The only other new investment in the latter years of this era was the establishment of a gas processing plant, Phoenix Park Gas Processors, funded largely by private foreign investors.

## ***2.4 Modern Era – 1993-present***

Resource-based industrialization entered a new phase of development in the 1990's. This modern era was characterized by state divestment of its holdings in the sector and the injection of significant private capital, local and foreign, and the consequent rapid expansion of natural gas utilization. Natural gas utilization increased from a little over 500 mmscfd in 1993 to cross the 1 bcfd mark by the end of the decade. The expansion occurred in all the major industries - ammonia, methanol, iron and steel and power generation. In 1996, natural gas output for the first time exceeded that of crude oil on an energy equivalent basis, as a result of contrasting output trends. The gap became wider when Trinidad and Tobago entered the Liquefied Natural Gas (LNG) business in 1999 with the coming on-stream of ALNG train 1. Since then, LNG production capacity had

expanded to 4 trains producing some 15 million metric tonnes per year, bringing total natural gas utilization to 3.1 billion cubic feet per day by year end 2005.

The oil sub-sector enjoyed renewed hope in this period. In an effort to rationalize the operations of the nationally owned oil companies, the Point Fortin refinery was mothballed in the late 1990s and a major upgrade project commenced at Point a Pierre. It was expected that the upgrade would greatly enhance the complexity and flexibility of the refinery. Crude oil output trended downward until the discovery in 2002 and subsequent production of new reserves by BHP Billiton. Crude oil production in 2005 amounted to 52.4 million barrels, the highest level in 15 years.

The electricity sub-sector experienced major restructuring in this era. Government undertook the partial divestment of the assets of the Trinidad and Tobago Electricity Commission (T&TEC) in 1994. This signaled the return of private participation in power generation for the first time in nearly 50 years. Prior to 1994, the electricity sector was operated by T&TEC as a state-owned vertically integrated monopoly. The divestment of the power generation business took effect in 1994 when the Power Generation Company (Powergen), a foreign/local joint venture, commenced operations. Trinity Power, a fully foreign owned independent power producer (IPP), commenced operations in 1999.

## ***2.5 Recent Performance***

### **Industry Organization**

The Trinidad and Tobago petroleum industry exhibits a mixed market structure at various stages of the value chain.

The upstream business consists of the group of largest companies, which are mainly foreign owned. These include the local subsidiaries of international giants BP Trinidad and Tobago, BG Trinidad and Tobago, BHP Billiton, and Repsol YPF. EOG Resources,

a small US independent, and state-owned Petrotrin complete the picture of major firms in the exploration and production business. There are also a number of small independent operators, mostly locally owned, which produce under Lease Operator and Farm-out<sup>1</sup> contracts, mainly on land.

In the case of the refining business, 100% state-owned Petroleum Company of Trinidad and Tobago Limited (Petrotrin) is the only player. The company owns the 160,000-bpd refinery situated at Pointe a Pierre, which exports most of its output to the Caribbean and Central America, with occasional cargoes sold internationally. Formed in 1993 with the merger of petroleum operations of then existing state companies Trintoc and Trintopec, Petrotrin is an integrated company producing about 40 % of the crude oil required for its refinery. While the refinery must import crude to meet its capacity requirements, some 55 per cent of crude oil produced locally is exported.

There are two players in the Transportation Fuels market. State owned National Petroleum Marketing Company (NPMC) is the main distributor of transportation fuels and lubricants in the domestic retail market. In 2002, the United Petroleum Distributors (Unipet) commenced operations as a relatively small wholesale distributor supplying its branded petrol stations.

The major transnational corporations also dominate the upstream segment of the natural gas sub-sector. However, state-owned National Gas Company (NGC) owns and operates the cross country pipeline network – which now comprises four major pipelines. In addition, NGC plays several roles including that of gas merchant and aggregator. Apart from sales to LNG, all natural gas utilized in Trinidad and Tobago is sold through NGC. Its subsidiary, the National Energy Corporation (NEC), is responsible for Business and Infrastructure Development. There is a single gas processing plant Phoenix Park Gas Processors Limited, which is a joint venture between NGC and Conoco.

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<sup>1</sup> Lease operators hold sub-leases from the State Oil Producing Company Petrotrin. They produce wells in mature depleted areas since their operating costs are lower than the State Company. Holders of Farm-outs, unlike lease operators, can explore leases and drill wells as well.

Large privately owned firms dominate downstream petrochemical and heavy industries. The most significant elements of the sector are 4 LNG Trains, 7 methanol plants including two of the largest in the world, 10 ammonia plants, 1 urea plant, an iron and steel complex, and two independent power producers. The majority of NGC's customers are in the Light Industrial and Commercial (LIC) subsector, which comprises over 110 firms. However, with an average LIC consumption of less than 100 MCFD, this sector accounts for less than 1 % of total gas sales.

### **Legislative Framework and Governance**

The Ministry of Energy and Energy Industries is responsible for the monitoring, control and regulation of the energy and mineral industries (Act #46 1969). The Ministry is also involved in policy making and implementation. However, the most important decision making body with respect to energy sector policy matters is the Cabinet Standing Committee on Energy. This ad hoc committee is comprised of ten (10) Ministers of Government, senior technocrats from the Ministry of Energy and Energy Industries, Ministry of Finance and Ministry of Planning, and the Chairmen and Chief Executives of the energy sector state enterprises, including NGC, NEC, Petrotrin and T&TEC.

Matters related to fiscal policy, taxes and exemptions are under the purview of the Ministry of Finance.

The Environment Management Agency (EMA) is the approving agency for environmental matters.

A Natural Gas Act has been contemplated for several years but has not come to fruition.



## Reserves

As of 1 January 2005, Trinidad and Tobago had proven reserves of natural gas estimated at 18.8 Trillion cubic feet (Tcf), with additional probable reserves of 9.3 Tcf and possible reserves of 7.7 Tcf. Most of the gas reserves are located in two major areas -- the East Coast Marine Area (ECMA), with approximately 70 per cent of reserves, and the North Coast-Marine Area (NCMA). Many consider Trinidad and Tobago to have undiscovered gas resources in the region of an additional 60-80 trillion cubic feet. Natural gas reserves have increased significantly over the last 10-12 years. In 1993, when the decision to pursue the first LNG project was made, the country's total reserves stood at only 12.9 trillion cubic feet, 58 % of which was in the proven category. Today (2006) total reserves stand at approximately 35 trillion cubic feet, of which 18.8 Tcf are proved.

As of 1 January 2005, proven crude oil reserves stood at 620 million barrels, while probable and possible reserves amounted to 404 million barrels and 1688 million barrels respectively.

TABLE 1

### HYDROCARBON RESERVES (1.1.05)

	<b>Proved</b>	<b>Probable</b>	<b>Possible</b>
Crude Oil (MMBO)	620	404	1688
Natural Gas (Tcf)	18.8	9.03	7.07
<b>Source: Ministry of Energy and Energy Industries</b>			

## **Exploration Activity**

Over the last five years, Government policy has demonstrated an acute awareness of the need to replace reserves and build up reserves capacity. Conscious of the fact that only about 2/5 of the country's marine acreage has been explored. Government has embarked on an aggressive programme of licensing in order to boost the exploration effort. Competitive bid rounds in 2003-04 and again in 2005 have opened the door to a number of companies to engage in fresh exploration in what the industry considers to be challenging and complex geology. The new exploration activity is focused primarily on three areas: Deep horizons on land in the Southern Basin, the shallow marine acreage, and the Deep Atlantic Acreage including acreage off Tobago.

Several international companies operate or are involved in exploration in Trinidad and Tobago. Table 2 below shows the lists the companies which have held or are holding exploration licenses in the form of Production Sharing Contracts (PSC's ) since 1995.

Chart 1- Location of Reserves – gives a glimpse of the location and sizes of exploration blocks.

The signing of 4 new production sharing contracts in 2005 coupled with the planned work obligations of the existing producers is expected to set the stage for a very active year of exploration in 2006. A total of nine exploration wells are forecast, compared with only two in 2005. The Ministry of Energy is currently assessing bids submitted in response to the Competitive Bidding Order 2006, which invited bids for 11 new blocks.

**TABLE 2**

**Trinidad and Tobago Production Sharing Contracts**

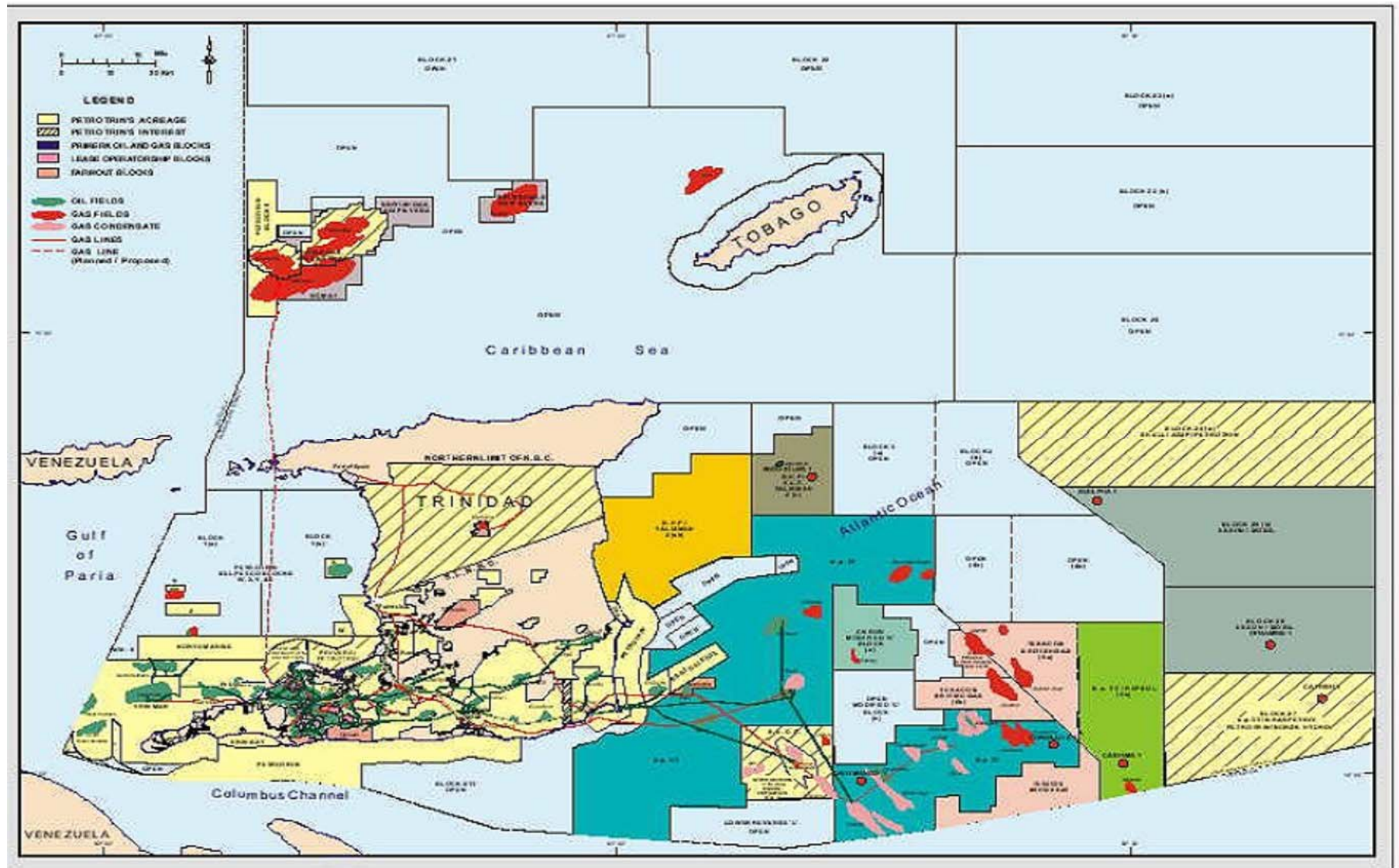
*1995-2005*

<b>Blocks</b>	<b>Area (hectares)</b>	<b>EFFECTIVE DATE</b>	<b>Company/Consortium (Operator's name listed first)</b>
2(c)	51,772	April 22, 1996	BHP/Elf /Talisman
2(ab)	133,504	June 4, 1996	BHP/Talisman
Modified U(a)	38,881	July 17, 1996	Enron
S11(b)	39,260	November 6,1996	Elf/Amoco /Repsol
5(b)	73,691	January 20, 1997	Amoco/Repsol
NCMA1	93, 949	March 26, 1997	British Gas/Agip/ Deminex
4(a)	45,743	June 25, 1997	Conoco
4(b)	75,333	June 25, 1997	Conoco
5(a)	40,761	December 10 1997	British Gas/Texaco
25(a)	138,811	February 4 1998	Shell/Agip
25(b)	139,076	February 11 1998	Exxon
26	119,520	February 11 1998	Exxon
27	117, 880	February 18 1998	Arco/Braspetro/Union Texas
3(a)	614 sq. km	April 22 2002	BHP Billiton /BG/Talisman/Total Fina

<b>Blocks</b>	<b>Area (hectares)</b>	<b>EFFECTIVE DATE</b>	<b>Company/Consortium (Operator's name listed first)</b>
			Elf
Lower Reverse "L"	364 sq. km	April 29 2002	EOG Resources
Block 22, 1a, 1 b	na	July 2005	Petro Canada
Block 3b	na	July 2005	Kerr McGee/ Primera
Block 5c	na	July 2005	Canadian Superior Energy Inc.
Block 4a	na	July 2005	EOG Resources

Source: Ministry of Energy

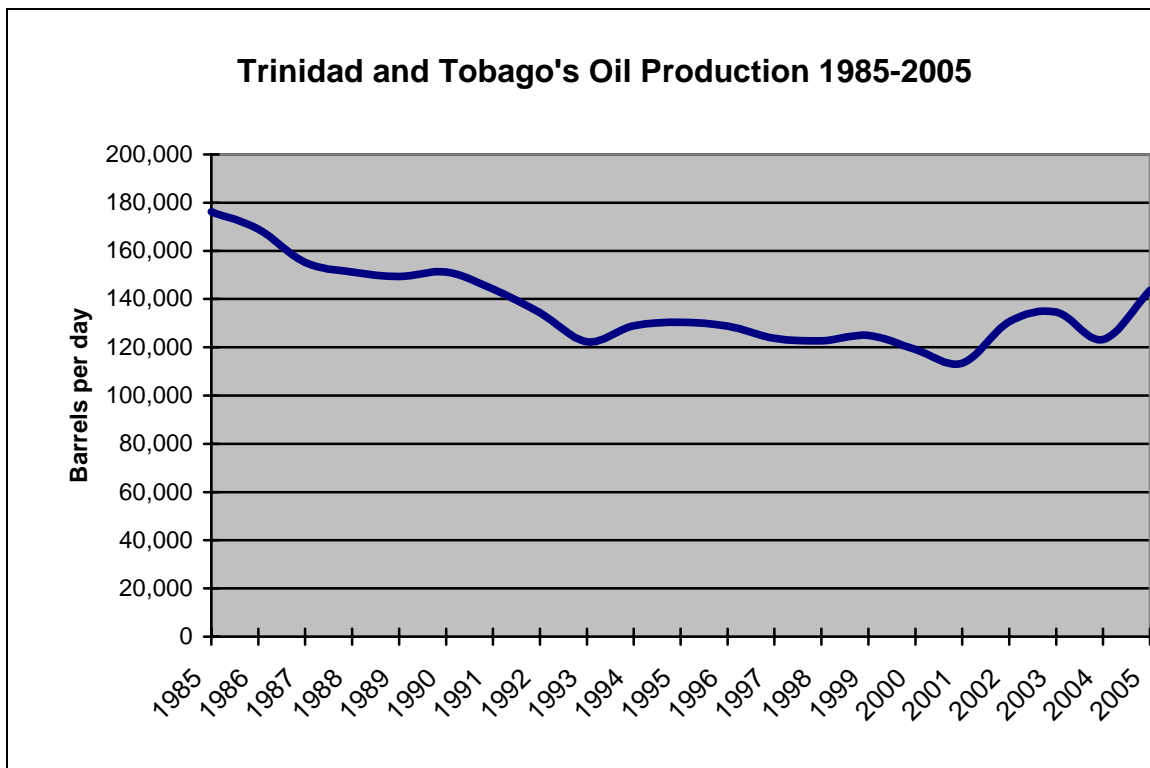
# Chart 1 Location of Reserves



## Crude Oil Production

Crude oil production amounted to 143,700 barrels per day or 52.4 million barrels in 2005, the highest level since 1991. The upswing in output is largely due to the start of production from BHP Billiton, and reverses an enduring decline in oil production dating back to 1978. (See chart 2 below)

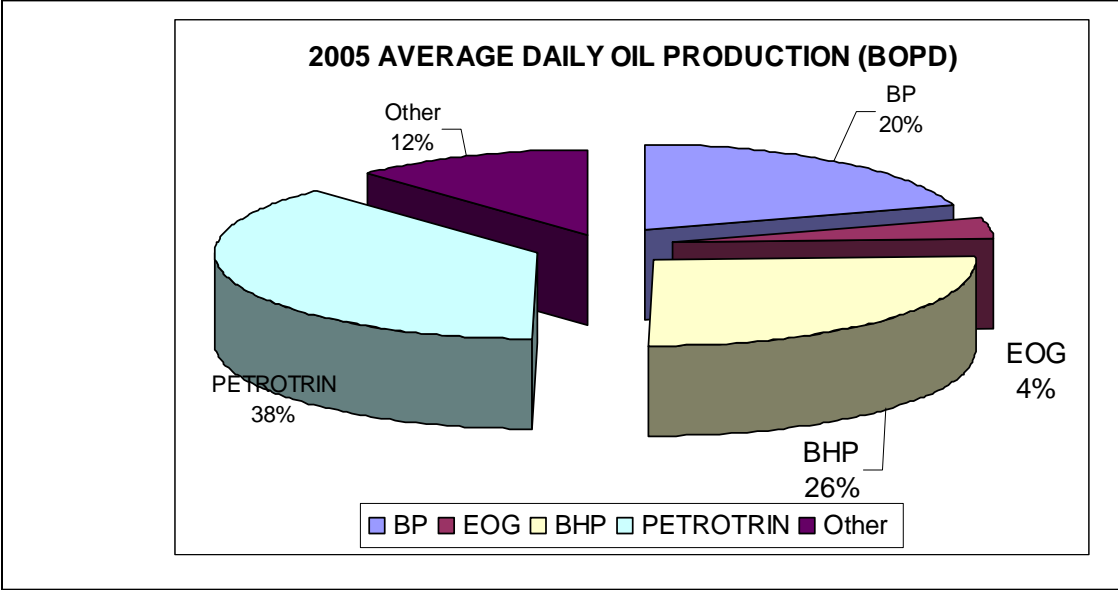
### Chart 2



Source: Ministry of Energy and Energy Industries .

The pie chart below shows the distribution of crude oil production by company in 2005. In terms of company contributions, Petrotrin contributed 38%, BHP Billiton 26% and BP 20%. Other producers, including Repsol and Primera, together earned a 12% share.

Chart- 3



**Natural Gas Production**

In 2005, production of natural gas averaged 3087 million cubic feet per day (MMCF/d). BPTT continued to be the dominant producer, contributing approximately 65 per cent of the gas produced, while BG and EOG produced 20 and 10 per cent respectively. NGC collects low-pressure gas emanating from mature oil fields of Teak, Poui and Sammaan, and compresses it to pipeline pressure for injection into the system, producing about 4 per cent of total supply. Petrotrin and the other small producers produced the remaining gas.

**Table 3**

**NATURAL GAS PRODUCTION 2005**

<b>Company</b>	<b>Volume (MMCF/d)</b>	<b>Per cent (%)</b>
BPTT	1924	62
BG	604	20
EOG	297	10
Petrotrin	130	4
NGC and Others	120	4
<b>Total</b>	<b>3087</b>	<b>100</b>

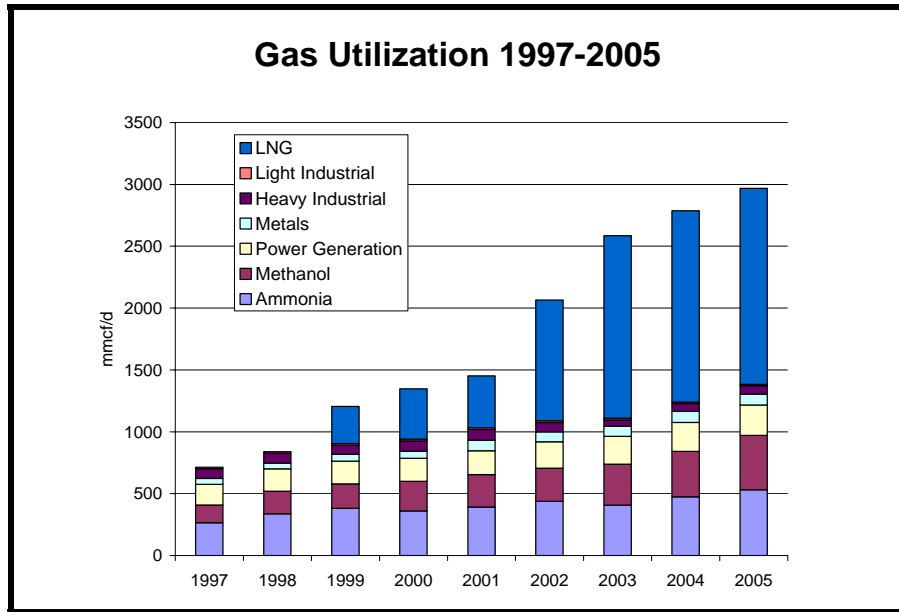
*Source: NGC: MEEI*

**Gas Utilization**

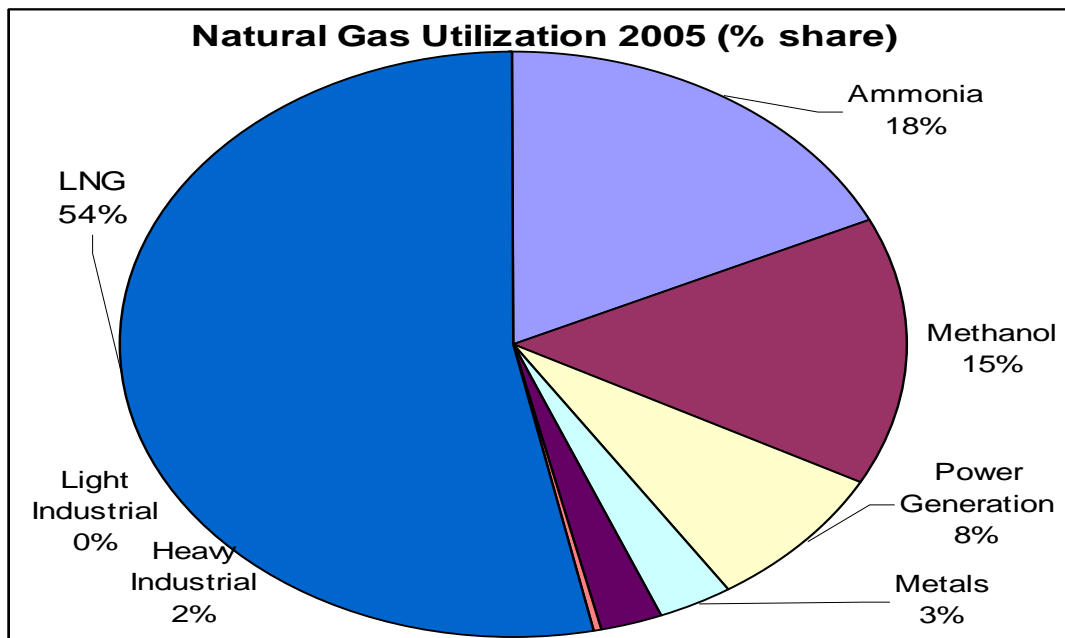
The major gas consumers of natural gas in Trinidad are LNG, Petrochemicals, Power Generation and Iron and Steel industries. In 2005, the largest user of natural gas was Atlantic LNG, which processed approximately 54 per cent of the natural gas produced into LNG for export. The second largest user group was the ammonia plants (18% per cent), followed by methanol (15% per cent) and power generation (8% per cent). Most of the remaining volumes are consumed in heavy industry by iron and steel (3%) and cement plants (2%). The light industrial and commercial sector consumes less than 1 % of the gas by volume but make up the majority of the gas users. The LIC sector comprises over 110 users, including light manufacturers, commercial centers, restaurants, hospitals and transportation businesses. Table 5 shows a list of companies currently involved in downstream business.



### Chart 5



### Chart 6



## Ownership Structure

While the state played a major part in the development of the natural gas industry, particularly downstream, the current ownership structure is dominated by foreign private interests. This is a direct consequence of an apparent state policy decision to stay out of direct investment in productive enterprises in the aftermath of ten years of economic decline. Since 1993, most of the investment in the sector has been made by foreign private sector interests. The government's share of the benefits comes largely from the sale of gas to the companies, taxes on these companies, and gas royalties.

TABLE 4 –  
EXISTING GAS-BASED PLANTS (1959-2005)

Company	Start up year	Estimated Cost (US \$M)	Product
YARA ( Formerly Hydro Agri and Fedchem)	1959	n.a.	Ammonia
Trinidad Nitrogen (Tringen) I	1977	125.0	Ammonia
Caribbean Ispat Ltd.(formerly ISCOTT)	1980	468.3	Direct reduced iron, steel billets & wire rods
PCS Nitrogen I (formerly Fertrin, Arcadian)	1981	333.3	Ammonia
PCS Nitrogen II (formally Fertrin, Acadian)	1984	172.5	Granular urea
Trinidad and Tobago Methanol Company (TTMC)	1984	182.8	Methanol
Tringen II	1988	350.0	Ammonia

<b>Company</b>	<b>Start up year</b>	<b>Estimated Cost (US \$M)</b>	<b>Product</b>
Phoenix Park Gas Processors Ltd. (NGLs)	1991	98.8	Propane, butane, and natural gasoline
Caribbean Methanol Company (CMC)	1993	200.0	Methanol
TTMC II	1996	235.0	Methanol
PCS Nitrogen III	1996	75.0	Ammonia
Petrotrin	1997	12.0	MTBE
Atlas Methanol	2002		Methanol
Titan Methanol	2005		Methanol
M5000	2005		Methanol
Caribbean Nitrogen			Ammonia
Nitro 2000			Ammonia

### **3 The Political and Economic Context**

Like many other oil exporters, the Trinidad and Tobago economy experienced boom conditions in the period of the seventies and early eighties, driven by increases in oil prices and production. The period was also characterized by an increase in state participation not only in the energy sector, but in many other aspects of the economy. Blessed with windfall revenues, the State in almost all oil exporting countries expanded its direct involvement in productive enterprises. There were perhaps three primary drivers. The first was to develop industry which would not be attractive to or was beyond the means of the domestic private sector. The second was the popular sentiment that

Government needed to increase the national ownership and control over the “commanding heights of the economy”. The third reason for increased state involvement was to save jobs in ailing industries.

The dramatic fall in oil prices, beginning in 1983, triggered a precipitous decline in the economic fortunes of Trinidad and Tobago and, more than anything else, caused a rethinking and reversal of economic strategy. The changed economic circumstances also had dramatic repercussions in the political sphere. In 1986, the Peoples National Movement (PNM) was voted out after thirty years in office. The National Alliance for Reconstruction (NAR), a fragile amalgamation of opposition forces, was given the task of managing the economy through the very difficult and uncharted waters. In 1988, worsening economic conditions forced the NAR Government to seek structural adjustment assistance from the International Monetary Fund (IMF). In its letter of intent to the Fund, Government succinctly described the roots of the economic crisis that had befallen the country.

“Between 1982 and 1987, the Trinidad and Tobago economy registered six consecutive years of negative economic growth. Over this period earnings from petroleum sector fell by close to one half and Government revenues from petroleum by 40%. The unemployment rate more than doubled from 10 to 22 per cent, and real GDP in 1987 was some 28 per cent below the level of 1982. In addition, despite a significant reduction in imports, there was a loss in foreign exchange reserves of some US \$2.8 billion between 1982 and 1987”.

The Government blamed the severe economic contraction on:

- The weakening and ultimate collapse of oil prices;
- Declining oil production;
- Imprudent demand management, and
- The failure of the Point Lisas energy-based investments to perform as expected.

The recovery programme agreed with the IMF focused heavily on expenditure reduction and efficiency improvements.

“The Government has been focusing a major part of its fiscal effort on improvements in the state enterprise sector with a view to reducing its burden on the Budget. The power utility and some of the recently established energy sector firms in Point Lisas were among those targeted for sale and or restructuring. In its medium term planning framework of the same year the Government emphasized “in 1987, some \$ 967 million was needed to cover the operating deficits and contingent debt liabilities of state enterprises and similarly circumscribed public utilities.” The Government committed that “the continuation of this hemorrhaging of scarce resources to support the state enterprises sector is just not sustainable and threatens to jeopardize priority development activity.” A combination of expenditure slashing and revenue enhancing measures were employed to stabilize the economy. The most telling were the introduction of Value Added Taxes (VAT), and an across the board 10% cut in public service salaries.

In the Medium Term Macro Planning Framework 1989-1995, the Government lays out its overall strategy for dealing with the state enterprises, including those in the energy sector. In broad terms, the strategy revolved around reduction in shareholding, winding up of those that were unviable and improving efficiency of those that were strategic. This policy position initiated a series of divestments within the state sector.

Austerity measures introduced by the then-fractured NAR government contributed to an improvement in macro-economic conditions. However, it came at a heavy price. In 1990 a radical Islamic group unsuccessfully attempted to seize power from the NAR Government. Their rationale was that the poor were being made to suffer by an uncaring Government. Not surprisingly, the NAR lost the 1991 general elections to a resurgent PNM.

The change in Government saw no alteration of the general trends of the reduction of state interest in directly productive enterprises. Speaking in the debate of the 1992 Budget, the PNM Government Industry Minister noted that:

“Government has a role to play in the state sector and that participation will continue at appropriate levels where:

1. The industry or enterprise is of strategic importance e.g. oil, gas and telecommunications.
2. The enterprise provides a social service e. g. T&TEC, WASA, PPTSC.
3. The industry or enterprise is essential to the economic diversification drive and private sector is unable to channel financial resources into such investments- downstream petrochemicals,
4. A foreign investor is interested in a major project but wishes to minimize country risks by including the state as a partner.”

The policy position of political parties in Government during the years of decline and adjustment indicates that their primary concern was reducing the fiscal burden of state enterprises, including those in the energy sector. While there was some interest in improving efficiency, there is no evidence to suggest that issues of market efficiency, pricing and competition were seen as important with respect to the energy sector.

The most significant development at liberalizing the economy occurred in April 1993, when the fixed peg of the TT Dollar to the US Dollar was abandoned and formal exchange controls removed. This together with the removal of restrictions on trade gave some hope that Government would allow greater influence of market forces in determining consumer choices and prices. However, the resumption of economic growth and improving performance of the energy sector slowed moves toward further liberalization in the real sector beyond the partial divestment of one utility.

A pattern of single-term Governments seemed set in 1995 when the PNM failed to win a clear majority. This opened the door for a coalition between the new NAR and the United National Congress (UNC) to take the reigns of Government, with the latter as the controlling party. The business of Government was a new experience for the UNC administration, given the party’s agricultural base. Probably for this reason, the

Government relied heavily on the advice of experts from international financial institutions, particularly with respect to the energy sector.

A near crisis emerged when the collapse of oil prices in 1998-99 was projected to impact heavily on the Government's fiscal position. Against this background, the Government again considered ways of dealing with a projected deficit. In a Letter of Intent to the IMF dated 16 March 2000, the Government stated that "it attaches great importance to reducing the role of the public sector in commercial activities and streamlining the civil service to enhance efficiency." Steps proposed to accomplish these objectives included the sale of shares in National Enterprises Limited, and plans to prepare two other state enterprises for privatization. With respect to the energy sector, the Government merely promised to "allow private sector distributors to enter the retail trade transportation fuels." Enhancement of the operational efficiency and financial viability of the utilities and developing in parallel a regulatory industries commission.

The recovery in oil prices and the rapid expansion of natural gas utilization since 2000 has dramatically turned around the economic fortunes of Trinidad and Tobago. The PNM Government returned to power in 2002 and, in economic conditions similar to those of the earlier "boom" period, has again placed the energy sector at the core of its industrialization and economic development strategy.

## TABLE 6

### TRINIDAD AND TOBAGO

KEY ECONOMICS INDICATORS (1981—2005)

	81-85	86-90	91-95	96-00	2001	2002	2003	2004	2005
Real GDP (Growth)	-2.4	-2.2	1.4	4.9	4.2	7.9	13.4	6.5	7.0
Inflation	13.0	9.8	7.1	4.0	5.5	4.2	3.8	3.7	6.9
Foreign Exchange Reserves	2,183.6	141.1	213.2	1,051.0	1,833.1	1,961.4	2,201.9	4,209.2	6,217.1
Government Surplus/Deficit	-1,765.7	-867.7	-134.7	-212.9	-40.6	186.8	1,835.0	1,932.8	4,967.3
Unemployment	12.1	20.6	18.6	14.1	10.8	10.4	10.5	8.4	8.0
Exchange Rate <sup>1</sup>	2.450	4.287	5.947	6.300	6.231	6.247	6.295	6.299	6.300

## 4 Market Liberalization: The Practice

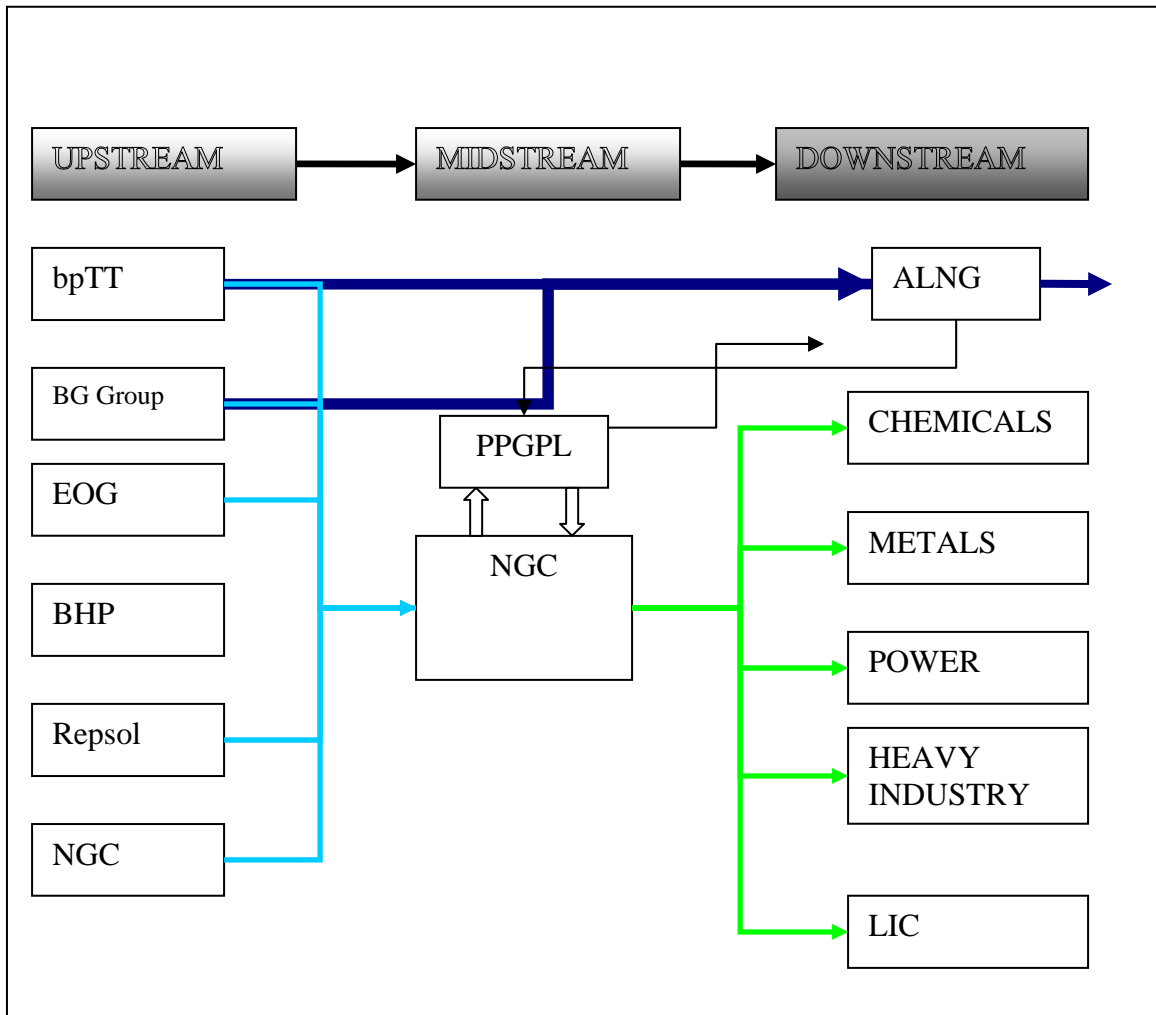
We shall examine the Trinidad and Tobago experience with energy market liberalization in three main sectors: Power Generation, Transportation Fuels and Natural Gas.

### 4.1 Natural Gas

Natural gas is the most widely used source of energy in Trinidad and Tobago, constituting some 80 % of primary energy consumption. Government's deliberate policy decision to use natural gas resources to promote industrialization resulted in a steady increase in natural gas consumption, averaging 8 % per year over the period 1975 to 1995. Over the next ten years, through 2005, the industry achieved a phenomenal compounded growth rate of 18% per annum, led by expansion in LNG production.



**CHART 7**  
**TRINIDAD AND TOBAGO**  
**CONCEPTUAL MAP OF NATURAL GAS FLOW**



**Market Structure**

One of the distinctive features of the Trinidad gas market development is the role played by the state agencies, National Energy Corporation and the National Gas Company. The NEC pioneered the early development of the industry in the period 1975 to 1990. In 1991, NGC’s mandate was expanded from being mainly a merchant and transporter to incorporate the business and infrastructure development functions of the NEC. This

merger was subsequently reversed in 2005 as the NEC resumed business as a stand-alone entity. Together these agencies have played a dominant role in the growth of the natural gas business in Trinidad and Tobago over the last thirty years.

NGC/NEC is dominant in its role and influence in the natural gas industry. As it stands today NGC/NEC is:

- The Merchant Aggregator. With the exception of deliveries to ALNG, all gas sold in the country passed title through NGC. Historically, NGC purchases gas from upstream producers under individual contracts and sells that gas to downstream industry. This historic role has experienced some evolution over the last five years. First, producers sell directly to ALNG without any transfer of title to NGC. Second some producers hold equity investment in downstream plants and supply a dedicated tranche of natural gas directly to the plant on back-to-back contracts with NGC. These contracts now account for about 30 per cent of the total NGC traded volumes and represent a significant departure from the norm.
- The sole transporter and distributor of natural gas. NGC owns all the pipelines in the country, including those delivering gas to ALNG. The distribution system that takes natural gas supply to over 140 customers is also owned and operated by NGC.
- Investor. NGC holds equity in Atlantic LNG, (10% Train 1, 11.11% Train 4), Phoenix Park Gas Processors (PPGPL); 51%, offshore compression Assets, and Offshore producing assets. In addition, NEC owns significant marine infrastructure at Point Lisas and La Brea.
- Business Developer. NGC/NEC has played a central role in developing the gas business. It actively promotes T&T and is often regarded as the one-stop shop for new investors in the business. It also negotiates gas prices for both purchases and sales of natural gas.

On the upstream end of the industry, the most significant feature of the market is the dominant position of one supplier. BPTT currently accounts for 62 % of gas traded, holds 60 percent of the country’s reserves and 30 % of the total marine leases. BP’s dominance is an important factor to consider in terms of market liberalization. BP also has equity interests in LNG, power generation and methanol. Other producers, BG and Repsol, also hold interests in LNG, while EOG Resources holds equity in the ammonia business.

The downstream sector is also oligopolistic in structure, with a few large firms accounting for over 95 % of the total market and over 100 small light industrial and commercial customers with a market share of less than 5%.

**TABLE 7**  
PRICING MECHANISMS IN T&T NATURAL GAS MARKET

<b>Sub sector</b>	<b>Pricing Mechanism</b>
LNG	Netback formula from US and European markets; Arms’ length negotiations
Petrochemicals	Indexed to product prices with floor and in some cases ceiling price determined in arms’ length negotiations.
Metals Industries	Base price with fixed escalator; Arms’ length negotiations
Power	Base price with fixed escalator; determined by Government
Heavy Industry (cement etc.)	Base price with fixed escalator. Reviewed with Government periodically.
Light Industrial and Commercial enterprises	Publicly known base price with fixed escalator. Subject to periodic govt. review

## Natural Gas Pricing

One of the primary drivers for introducing competition to any market is to allow dynamic interaction of supply and demand to determine the price of products or services. This is not always possible in the natural gas business particularly in an undeveloped young market where factors like market size, infrastructure and development goals predominate.

In the early years of the industry, gas prices to all sub sectors were set by Government, and comprised of a base price with a fixed escalator. Gas purchases from upstream producers were also priced on this basis and arrived at through arms length negotiations between the supplier and the Government or its agents (NGC/NEC).

The system has evolved over the last fifteen years. Today, the basis pricing formula is different for each subsector (Table 7). The evolution commenced with the introduction of product related pricing for the petrochemical subsector in the early 1990's. This method, which has been adopted by many gas surplus countries, indexes by formula the price of gas to the product (ammonia, methanol) price (Chart 8). The gas price therefore fluctuates with product prices thereby providing benefits to both the gas supplier/marketer (NGC) and the gas consumer (petrochemical plants). The gas supplier shares some of the market risks and pain in low price periods but receives the rewards when the market improves. The mechanism was partially extended to upstream supply contracts after several years of producer resistance. The product-related pricing formula has been a major factor in enhancing T&T competitiveness and its emergence as the leading exporter of ammonia and methanol.

Pricing arrangements with respect to LNG follow the standard international model where consumer market prices determine values throughout the gas value chain via a netback fraction formula. Gas prices to other industries remain on a fixed escalator basis. In the case of the metals industries, gas prices are determined in arms-length negotiations. Gas prices to the power generation subsector are determined by Government in accordance with its social and macroeconomic objectives. With the exception of the light industrial

and commercial sector, gas prices in Trinidad and Tobago are treated as confidential between contracting parties. The price of gas to light industrial and commercial sector is transparent partly because it is applied to over 90 per cent of NGC's customers and is used as a deliberate marketing tool when seeking to expand the market share. Natural gas has a huge price advantage over alternative fuels despite the Government subsidies on the latter (Table 8).

## TABLE 8

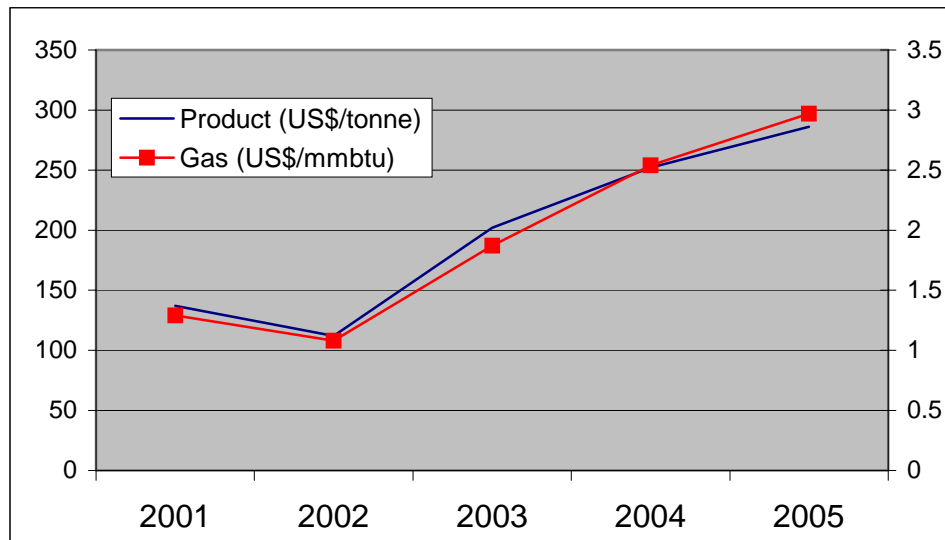
### COMPARATIVE ENERGY PRICES<sup>1</sup> (Effective November 2006)

Energy Source	US Cents/KWH	US\$/MMBTU <sup>4</sup>
Natural Gas 1 <sup>2</sup>		\$1.57
Natural Gas 2 <sup>3</sup>		\$2.58
Diesel Oil		\$6.53
LPG		\$8.79
Elec. D3 <sup>4</sup>	4.45	\$15.00
Elec D2	4.90	\$16.09
Elec- D1	7.35	\$24.22
Notes:		
<ol style="list-style-type: none"> <li>1. Natural gas prices relate to light industrial and commercial customers only. Base prices of natural gas to heavy industry and petrochemical industry are generally lower and fluctuate with commodity prices.</li> <li>2. Natural Gas -1 – Customer pays for the gas connection</li> <li>3. Natural Gas -2 – NGC bears the initial cost of connection.</li> <li>4. Electricity rates quoted are recommendations of the RIC</li> </ol>		

## CHART 8

### TRINIDAD AND TOBAGO

#### AMMONIA AND NATURAL GAS PRICES 2001-05



#### **Market Liberalization and Competition.**

Given the success of NGC's multifaceted contribution to the development of the industry, the market structure was not called into question until 1997. Since then, at least three policy studies have addressed the question of the structure of the natural gas market.

In 1996, the new Government requested assistance from the World Bank to formulate a policy strategy for the natural gas sector. In its final report, the World Bank lauded NGC's contribution but concluded that the industry had reached a stage of maturity that made it unnecessary for Government to allocate more public funds or accept additional risks. It noted however that "the regulatory issue of natural gas is different from that in large countries such as the US and Great Britain where de-regulation was designed to bring benefits to millions of domestic consumers." Despite this caveat, the World Bank made the following recommendations on the role of NGC:

1. Separate NGC's transmission operations by creating a service-driven company that will receive an adequate tariff for non-discriminatory, open access service.
2. Divest NGC's industrial assets in compression, processing, distribution and LNG, as they lose strategic significance.
3. Convert NGC's promotional business into a marketing unit and make pricing and risk more transparent in merchant decisions.
4. Phase out NGC's merchandising function as a sole buyer and seller of natural gas.

These far-reaching recommendations stimulated some discussion, but apparently did not lead to any policy action. A draft energy policy published by the MEEI in 2000 did not take a position, indicating instead that Government would initiate a review of the role of NGC in the context of an ongoing Gas Master Plan project. Master Plan consultants Gaffney Cline and Associates again zeroed in on the structure of the industry and the role of NGC. In their 2001 Report, the consultants recommended three fundamental steps to restructure of the gas sector:

1. Remove the monopoly right to buy and sell gas. This was not meant to take away NGC's merchant function but to merely remove the exclusivity. The intent was to create the opportunity for gas-on-gas competition.
2. Allow third party access to transportation infrastructure. This separation of the merchant business from the transportation business was necessary to discourage discriminatory treatment.
3. Place the sector under the oversight of an independent regulator. This would relieve NGC of the burden of being a quasi regulator, a role that could conflict with its role as merchant.

The Gas Master Plan Report evoked no discernable policy response, perhaps because of the change in the political leadership of the country.

The third important policy shaping initiative was part of the current Government's Vision 2020 National Strategic Development Plan. The Report of the Vision 2020 Energy Subcommittee noted that "important elements of the de facto regulatory framework for gas transmission remain informal and not codified into regulations." It confirmed that "both the Gas Master Plan and gas consumers have suggested the need for changes to this framework." (Vision 2020 Energy Sub-Committee Report, p. 7). The need for a "regulatory framework that facilitates open access and pricing" was also mentioned as one of the recommendations coming out of an Energy Subcommittee Workshop. One of the major goals of the Energy Sub-committee Report is "a robust and respected institutional regulatory framework to manage the industry." A specific objective under this goal is "to establish a relevant and flexible regulatory framework" (Vision 2020 Energy Sub-Committee Report, p. 56).

The main policy documents produced over the last ten years recognize the need for some form of market liberalization. Interviews conducted for this study endorse this view; however, no official moves have been made in that direction. There are perhaps four major challenges to be addressed in order to create competitiveness in the gas markets:

1. The role of NGC
2. Allocation of supplies
3. Price determination
4. Transition issues

Stakeholder responses to these issues were interesting. Firstly, what should be the role of NGC? All stakeholders in the market recognize the important role played by NGC/NEC in development of the market. If, however, competition is to be introduced into the market, then it is imperative that the current role of NGC will have to be radically altered. It is on this score that there is some divergence of views on the future. The present situation, which combines government direction with commercial and regulatory functions in one state enterprise, is recognized as inefficient. However, the small size of the market and the dominant position of a few large firms are constraints on the degree of



liberalization that can be attempted. The role of NGC is seen as providing a counterweight to any single customer or producer being able to abuse its position.

The views of the respective stakeholders can be condensed into two options. The first sees NGC retaining its roles as transport service provider and aggregator. In this option, the service provided by NGC should be unbundled to provide greater transparency over the transportation services. NGC should be compensated for risk and receive a share of value derived from the market upside. Government policy direction and business development functions should be handled by a separate agency of Government. In the second option, there is direct sale between producers and consumers. NGC is only a transporter of gas, with its tariff and service quality regulated and monitored as any other utility. In both instances NGC's investments are placed into a separate investments company so as to avoid conflicts of interests.

Second, can the market mechanism allocate supplies in a manner consistent with national objectives? Historically the problem of supply allocation to various end uses has been solved by Government through NGC/NEC in accordance with its own strategic preferences. In a liberalized market with producers having an unfettered right to market, their choices may be very different. In the current market scenario for example producers view LNG as the market with the highest net-back value in the short term. Left to their own designs incremental supplies would be channeled to LNG at the expense of other sectors. Several negative consequences are envisaged. The availability of gas to petrochemicals and other downstream industry becomes a major issue. There might be a more rapid depletion of the country's natural gas reserves than otherwise. The state loses control over the use of natural gas as a strategic asset. Both the socio-economic goals (cheap electricity) and the macro-economic objectives (deepening and diversifying downstream) are threatened. Whereas there may be short-run benefits in terms of increased revenue from Government, the country may have sacrificed its longer term goal of sustainable development. One solution proposed for the allocation problem is legislation that would mandate every producer to dedicate a minimum percentage of their reserves to the domestic market. Those reserves should be sold on a competitive basis

under short-term contracts. Government, however, still loses some of its control over the use of resources.

The third issue is that of price determination. In large developed markets, particularly of the north, natural gas is like any other commodity. It is widely traded and prices are determined by the interaction of supply and demand in a dynamic competitive market. In the Trinidad and Tobago context, natural gas is used in different applications (petrochemicals, LNG, iron and steel), each with a different pricing structure. In a liberalized market structure there may be a tendency for prices to converge towards the highest value or greatest volume. In the Trinidad context, this means convergence towards LNG prices. The prospect of such a development has tremendous adverse implications on the viability of the industries, which, in part, were built in T&T because of the competitive advantage provided by low-cost gas supply. However, some suppliers see linkage with Henry Hub as one way of reducing the differential that now exist between netback well head prices from LNG as opposed to petrochemicals.

The fourth set of challenges relates to the transition mechanisms. Any shift from state monopoly control to a competitive market must be accompanied by legislative reform. When the state is as heavily involved as it is in Trinidad and Tobago, problems of transition are multiplied. NGC holds multiple purchase and sales contracts with disparate terms and conditions, including price and duration. Then, there is the issue of the supply to sectors that currently receive Government subsidized prices.

Competition in gas markets in Trinidad and Tobago is achievable, at best, in the medium term horizon of 5 to 8 years. The state's desire to use natural gas as a critical element of its industrialization strategy and market imperfections seem to be the biggest deterrents. An evolutionary approach and flexibly regulatory oversight will perhaps be the most immediate steps to competition.

## **4.2 Power Generation**

### Structure of the Electricity Sector

The power generation sector in Trinidad and Tobago comprises one transmission and distribution company (the Trinidad and Tobago Electricity Commission, or T&TEC) and two power generators, Powergen and Trinity Power. T&TEC purchases bulk electric power from the independent generation companies for resale to its domestic, commercial and industrial customers. T&TEC is also responsible for procuring natural gas for the generation companies, through a contract with the National Gas Company of Trinidad & Tobago Limited (NGC).

The Power Generation Company of Trinidad and Tobago (Powergen) was established as a joint venture created out of the partial divestment of T&TEC'S generation assets. Current shareholders are T&TEC (51%), Mirant Corporation (39%) and BPTT (10%). Powergen's current installed capacity is 1178 MW, consisting of 100% single cycle gas-fired generation. Powergen owns and operates power stations at the following locations:

Port of Spain (308 MW)

Point Lisas (634 MW)

Penal (236 MW)

The company sells bulk power to T&TEC under a 15 year power purchase agreement (PPA). The PPA specifies the mechanism for determining the price to be paid by T&TEC for bulk power, based on capacity and demand charges. Periodic adjustments in price are based on changes in fuel costs and inflation.

Trinity Power Limited first commenced operations in September 1999 as InnCogen Limited. Trinity Power Limited is owned by a consortium of American companies, with Power Management Company holding a controlling interest. Trinity Power's current total installed capacity is 225 MW. It sells bulk power to T&TEC under a 30-year power purchase agreement (PPA) for 195 MW. The agreement features terms similar to the Powergen agreement.

## Demand

T&TEC serves in excess of 350,000 customers in Trinidad and Tobago, broken down as follows:

1. Domestic

All domestic and household electricity supplies for use by one family living in one residence, supplied from one meter

2. Commercial

Electricity supplies for purposes other than domestic and household in a single installation supplied from one meter at low voltage

3. Industrial

Three Phase Low Voltage supply for all purposes supplied and metered at one point

D1: Low voltage supply: 230 Volts to a Maximum of 199 kVA and 400 Volts to a maximum of 350 kVA

D2: High Voltage supply for loads from 200kVA to 3999kVA at 6.6kV, 12kV, 33kV or 66kV, depending on locality and on the operating convenience of the Commission

D3: 33kV or 66kV or 132kV for loads from 4000kVA to 25000kVA

E: Very Large Load: 66kV or 132 kV for loads over 25,000 kVA

4. Street Lighting

The Commission provides this service to private individuals and organizations as well as to public sector agencies charged with the responsibility of securing safety on the roadways and on public property.

Over 97% of the population has access to electricity, and losses are estimated in the 8 to 10% range. T&TEC supplies power to Tobago via submarine cable and maintains an 11 MW diesel station on the island as back-up supply. Table 9 shows each group's share of the market, based on electricity sales and number of customers in 2003.

:

**TABLE 9**

## ELECTRICITY MARKET SHARES

<b>Class of Customer</b>	<b>Market Share based on Electricity Sales</b>	<b>No. of Customers</b>
Domestic	25.3%	312,805
Commercial	9.5%	32,419
Industrial	64.7%	2,409
Street Lighting	0.5%	N/A

Source: Table 4.1, Page 59, Table 4.2, Page 68, Regulation of Electricity Transmission and Distribution, June 01, 2006 – May 31<sup>st</sup>, 2011, Final Determination, June 2006, Regulated Industries Commission.

From 1992 to 2003, total sales of electricity in Trinidad and Tobago increased at a compound average growth rate of 5.5%. The industrial sector grew at the highest rate of 5.82%, while the commercial sector grew at 4.94%. Domestic sales grew at 5.07%. This demand growth is given in Table 10 below.

**TABLE 10**

## ENERGY CONSUMPTION (GWH) BY CLASS, 1992-2003

<b>Year</b>	<b>Domestic</b>		<b>Commercial</b>		<b>Industrial</b>		<b>*Total</b>	
	GWh Sold	Share (%)	GWh Sold	Share (%)	GWh Sold	Share (%)	GWh Sold	Share (%)
1992	894.6	26.6	342.0	10.2	2,116.2	62.8	3,367.3	100
1993	935.9	28.0	334.5	10.0	2,062.3	61.6	3,347.2	100
1994	921.2	26.4	343.9	9.9	2,210.5	63.3	3,490.6	100
1995	897.2	26.3	319.9	9.4	2,178.1	63.9	3,410.2	100
1996	1,002.0	25.4	360.4	9.1	2,565.6	65.1	3,943.7	100
1997	1,060.2	24.3	410.3	9.4	2,877.6	65.9	4,363.9	100

1998	1,117.9	23.8	432.3	9.2	3,127.4	66.6	4,696.4	100
1999	1,144.7	23.4	456.6	9.3	3,270.5	66.9	4,889.1	100
2000	1,250.6	24.9	475.1	9.5	3,271.7	65.2	5,015.4	100
2001	1,285.0	24.1	522.9	9.8	3,513.1	65.8	5,339.8	100
2002	1,398.7	24.8	520.2	9.2	3,706.8	65.7	5,646.0	100
2003	1,541.6	25.3	581.4	9.5	3,942.0	64.7	6,088.1	100

\* Total includes Domestic, Commercial, Industrial and Street Lighting figures

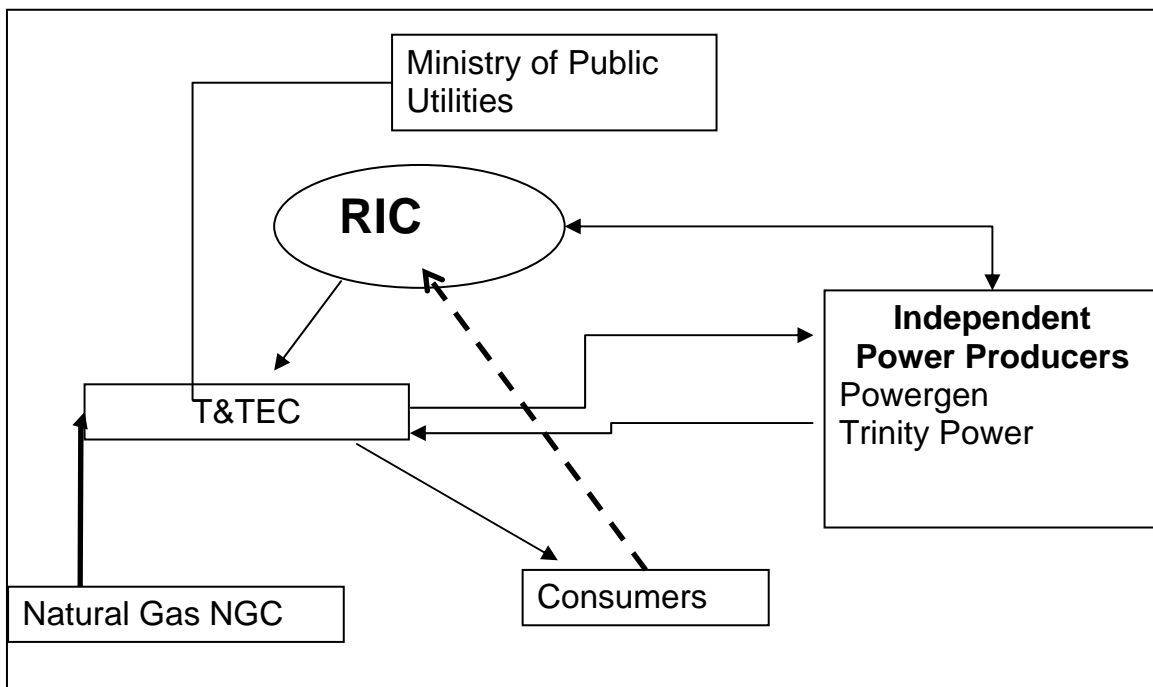
Source: Table 4.1, Page 59, Regulation of Electricity Transmission and Distribution, June 01, 2006 – May 31<sup>st</sup>, 2011, Final Determination, June 2006, Regulated Industries Commission.

## Institutional Framework

The institutional framework for the management of the electricity sector is defined in two pieces of legislation: The T&TEC Act and the RIC Act. The Ministry of Public Utilities and the Environment is the line Ministry for T&TEC and sets sector policy. Under the RIC Act, the Minister is responsible for granting licenses and under the T&TEC Act, a reporting and oversight role for the Ministry is also specified. The Ministry of Energy and Energy Industries is responsible for the companies involved in power generation and for policy direction of NGC, the supplier of natural gas.

### **CHART 9**

#### **POWER GENERATION SECTOR INSTITUTIONAL FRAMEWORK AND STRUCTURE**



Regulation of the power sector is in the hands of the Regulated Industries Commission (RIC), a statutory body established under the Regulated Industries Act of 1998. The Commission came into being on June 1, 2000, replacing the Public Utilities Commission, which performed a comparable function since its establishment in 1966. The RIC ensures that good quality and efficient services are being provided at fair and reasonable costs in Trinidad and Tobago. T&TEC, Powergen and Trinity Power come under the purview of the RIC.

### **Electricity Tariffs**

Tariffs for the electricity service are recommended by the Regulatory Industries Commission (RIC). The process requires T&TEC to present its case for a rate review to the Commission. The RIC does its own research and reporting on issues relevant to the rate increases and publishes a review of the condition and performance of the utility. The RIC then conducts public hearings on the rate case. Members of the public are invited to submit objections or comments to the RIC. The RIC's rate recommendations are then made public, but final approval of any rate increase is given by Government. Table 11 provides a comparison of electricity tariffs existing before the last RIC rate determination with the tariffs recommended by the Commission. In November 2006, Government approved the new tariffs for the commercial and industrial classes of customers. However, households continue to enjoy power at US 3.5 cents per kWh, as Government deferred decision on the new tariffs until an unspecified future date.



**TABLE 11**

T&T ELECTRICITY TARIFFS 2006  
(US cents/KWH)

<b>Customer Class</b>	<b>Current</b>	<b>RIC</b>	<b>% Increase</b>
	Avg US¢/kWh	Avg US¢/kWh	
A- Residential	3.58	5.00	39.4
B- Commercial	3.85	6.19	60.8
D1 Small Industrial	5.86	7.35	26
D2 Medium Industrial	4.35	4.9	12.5
D3 Large Industrial	3.36	4.45	32
E Very Large Industrial	2.78	3.31	19

### Policy Framework

Coming out of the period of economic decline and structural adjustment in the 1980s, the Government of Trinidad and Tobago embarked on an economic development strategy that focused on private investment as the engine of growth in the economy. The “Medium-Term Policy Framework: From Stabilization to Growth, 1993-1995” was developed with three basic objectives:

- (a) Improved fiscal and monetary management;
- (b) Increased reliance on the private sector for investment and growth;
- (c) An export-led approach to growth and employment creation.

Under this framework, ample and reliable electricity and improvements in the financial and operational efficiency of state enterprises were prerequisites for a nation seeking a

place in the world of international commerce. The intent was to reduce Government subsidies to state enterprises gradually over the medium term, with the expectation that these entities would achieve financial viability in the shortest possible time. It was stated that Government's participation in commercial activity would continue only in special and limited circumstances, which included areas of strategic importance to the growth of the economy. Government seemed committed to the restructuring and upgrading of the public utilities to enable them to deliver an efficient and reliable service at affordable rates.

### Market Liberalization and Competition

Consistent with the policy position of the Government, T&TEC was identified as an early candidate for divestment. During 1993, the possibility of encouraging foreign private sector investment in the generation of electricity was examined and the relevant legislation was amended to facilitate the process, as well as to allow T&TEC to form companies, to hold shares and to differentiate between the operations of the transmission and the distribution subdivisions.

In the formation of the Power Generation Company of Trinidad and Tobago, foreign partners paid some US\$ 72 million for 49% of the equity stake of the new company and committed to inject a further US\$ 36 million for plant refurbishment and maintenance. This was designed to improve the company's overall performance and operating efficiency. Additionally, funds were provided to T&TEC to eliminate the arrears owed by local government.

Although driven largely by the need to place T&TEC on a sound financial footing, there was hope that the sale of T&TEC's generation assets would have been the start of a full liberalization of the electricity sector. In some quarters, it was hoped that the sale of T&TEC would be completed with a public issue of shares. However, no further developments took place in this regard for several years. However, in 1999, InnCogen Limited commenced operations as the second independent power producer (IPP). The

InnCogen project was approved on grounds that it was to have been a co-generation facility to supply power to industrial plants within a designated industrial space. The excess power was to be sold to the national grid. However, the planned industrial complex never materialized; subsequently, a 30-year power purchase agreement was arranged between InnCogen and T&TEC.

Although neither of the two IPP in operation in Trinidad and Tobago can be directly linked to a policy of market liberalization, there have been several benefits that can be attributed to this change in the sector's production structure. These include:

- Improvements in reliability of service due to systematic maintenance programmes conducted by the IPPs. Both PowerGen and Trinity Power, under their power purchase agreements, have commitments to pre-determined operational performance standards. For example, with respect to availability, PowerGen has improved from 65% availability in the 1990s to the current level of 82% availability. PowerGen also maintains its expected standard of less than 5% of forced unplanned outages.
- Dividends received by T&TEC from its part ownership of PowerGen
- Improvements in T&TEC's own performance as a result of the concentration of resources on transmission and distribution issues. Over the period 1999 to 2003, the reliability of supply for transmission and distribution segment of the electricity sector has consistently improved.
  - The number of faults per 10 km of distribution lines has decreased from 4.10 in 1996 to 2.20 in 2001. The number of faults per 20 km of transmission lines has decreased from 9.36 in 1996 to 4.80 in 2001.
  - The percentage of interruptions not restored within 4 hours has decreased from 54% in 1996 to 9% in 2001. The percentage of interruptions not restored within 12 hours has decreased from 19% in 1996 to 1.3% in 2001.
- The existence of the two IPPs opens up the possibility of real competition for additional supplies as demand grows. When T&TEC determines that new power

generation capacity is required, an international competitive bidding process is undertaken in which pre-qualified single companies or joint ventures are allowed to participate. In the most recent of these exercises (January 2004), Powergen was awarded a 15-year contract to provide an additional 200 megawatts of power to T&TEC by 2007. Fulfillment of this contract requires PowerGen to install new generation capacity at its Point Lisas Power Station.

### **Outlook and Constraints**

Electricity demand growth in Trinidad and Tobago over the next five years will be driven by ongoing rapid industrialization, population growth and an accelerated housing construction programme. The demand forecast produced by the RIC is given in Table 12.

**TABLE 12**

FORECAST OF ELECTRICITY CONSUMPTION (KWH), 2006-2009

<b>Year</b>	<b>Domestic</b>	<b>Commercial</b>	<b>Industrial</b>
2006	1,747,989	675,738	4,670,711
2007	1,814,120	700,250	4,841,666
2008	1,881,795	726,106	5,025,309
2009	1,949,005	752,704	5,213,109

Source: Table 4.3, Page 68, Regulation of Electricity Transmission and Distribution, June 01, 2006 – May 31<sup>st</sup>, 2011, Final Determination, June 2006, Regulated Industries Commission.

To meet projected future demand for electricity, expansion of capacity of existing IPPs and/or the establishment of new IPPs would most likely be required. This would create an opportunity for eligible service providers to participate in the competitive bidding process for a share in the electricity market. But competition in the power market does not go beyond the periodic long-term power purchase agreement. Currently, several

factors inhibit the emergence of a fully liberalized electricity sector in Trinidad and Tobago:

- It is the standard practice in a fully liberalized market for IPPs to source their own fuel supplies. However, the supply and pricing of natural gas, the main fuel used for power generation, is controlled by the state. Agreement with the power producers requires T&TEC to procure natural gas from the National Gas Company and provide it to the power plants for processing. The IPP then charges T&TEC a conversion fee or tolling charge for producing the electricity. NGC provides T&TEC with the required gas at special low price determined by government. This is a major reason why Trinidad and Tobago customers still enjoy the lowest price of electricity in the region.
- T&TEC continues to hold a majority interest in Powergen; therefore, the latter's involvement in competitive bids cannot be seen as being at arms' length.
- The existing power purchase agreements limits T&TEC and Government from opening up the transmission and distribution business to private-sector participation.
- Trinidad and Tobago's relatively small market presents few options for market segmentation for the supplier. The market has not yet reached the scale to allow several players to exist. This factor also encourages supplier preference for long-term (15 years or more) power purchase agreements.
- Electricity prices are regulated by the RIC, which reviews proposals submitted by the utility and makes recommendations based on the commission's own research and analysis of local and foreign electricity practices. However, the RIC only makes recommendations. It is the Government that finally decides on the implementation of the new tariff. Such direct state interference in the setting of tariffs is at best anticompetitive.

Having defined a specific role for the electricity sector in the industrialization process, Government would ensure that several control mechanisms remain in place to achieve their wider objectives. Most stakeholders are of the view, therefore, that no policy shifts

will occur in the short or even medium term. Real competition in the power market is likely to be a long-term phenomenon, at best.

### **4.3 Transportation Fuels**

#### **Structure of the Local Transport Fuel Sector**

The retail market for Transportation fuels is still a virtual monopoly with the National Petroleum Marketing Company (NPMC) as the dominant firm. The Petroleum Product Act of 1969 sanctioned NPMC as the only wholesaler of petroleum fuels. NPMC retail distribution network comprised a nationwide network of over 154 stations. Only 28 of these are company owned and operated. The vast majority (69) are Company owned but operated by dealers under the terms of a Retail Marketing Contract. The fifty-seven (57) other stations are dealer owned and operated under the NP brand. NPMC is also engaged in the blending and marketing of lubricants and the wholesaling and retail distribution of LPG.

The NPMC monopoly on the wholesaling of transportation fuels was broken in 1999, when UNIPET was granted a wholesale license as part of the partial liberalization of the transportation fuels market. UNIPET now operates a network of nine (9) service stations.

Supplies of transportation fuels are sourced from Petrotrin, the State owned integrated oil company. Wholesalers are not permitted to import fuel supplies and Petrotrin is not permitted to be involved in the retail sector. The market falls under the purview of the Ministry of Energy and Energy Industries.

#### **Price and Subsidy Issues**

In Trinidad and Tobago, as in most oil exporting countries, the retail price of petroleum fuels is set by Government. Moreover, since the passing of the Petroleum Production Levy and Subsidy Act, in 1974, Government has pursued an active policy of subsidizing prices of petroleum fuels. The subsidy mechanism involves the reimbursement of the

wholesalers for the difference between the international market price and the controlled consumer price of petroleum fuels.

Wholesalers, NPMC and Unipet, acquire product from Petrotrin at international prices. Retailers sell to consumers at fixed Government controlled retail prices. Government then refunds the wholesalers for the difference in the fuel costs. Part of the subsidy is recovered by Government through the Petroleum Levy, which is charged to the oil-producing companies in direct proportion to their share of total production.

While crude oil prices have increased sevenfold (700%) since 1986, retail prices of transportation fuels in Trinidad and Tobago have actually declined in real terms. Nominal prices of gasoline have doubled, while diesel has increased by only 14 % in 20 years. (Chart 10)

**CHART 10**  
T & T LIQUID FUEL PRICES ( 1986-2006)

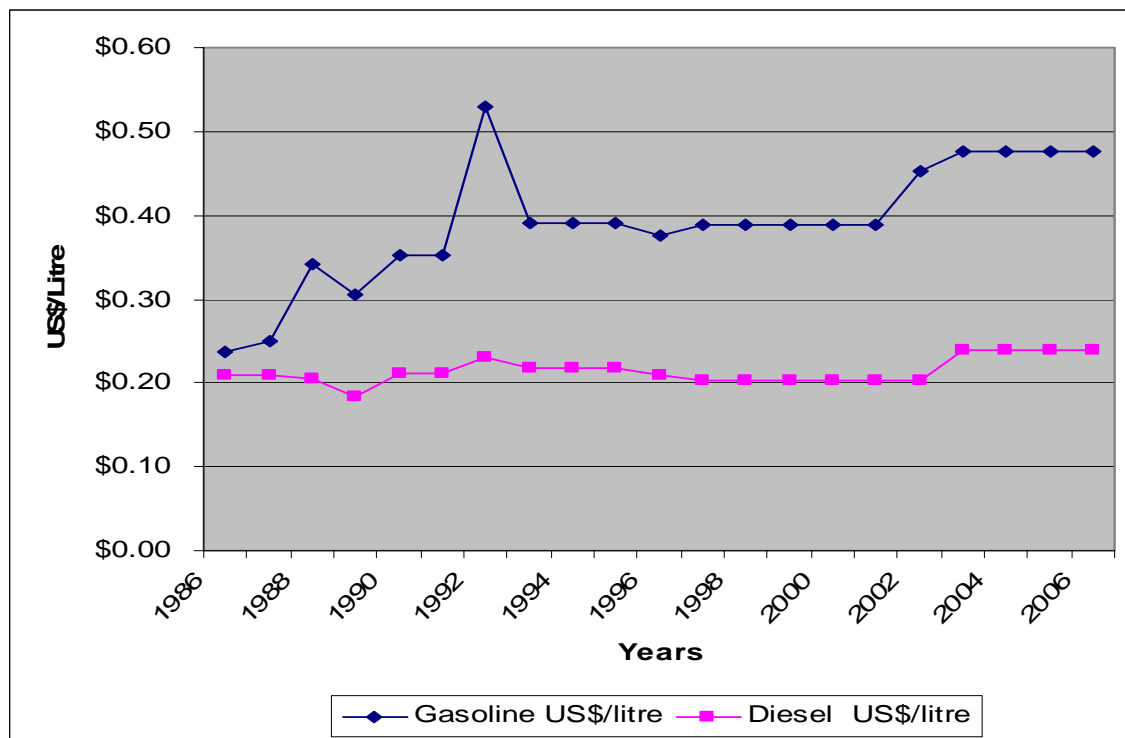
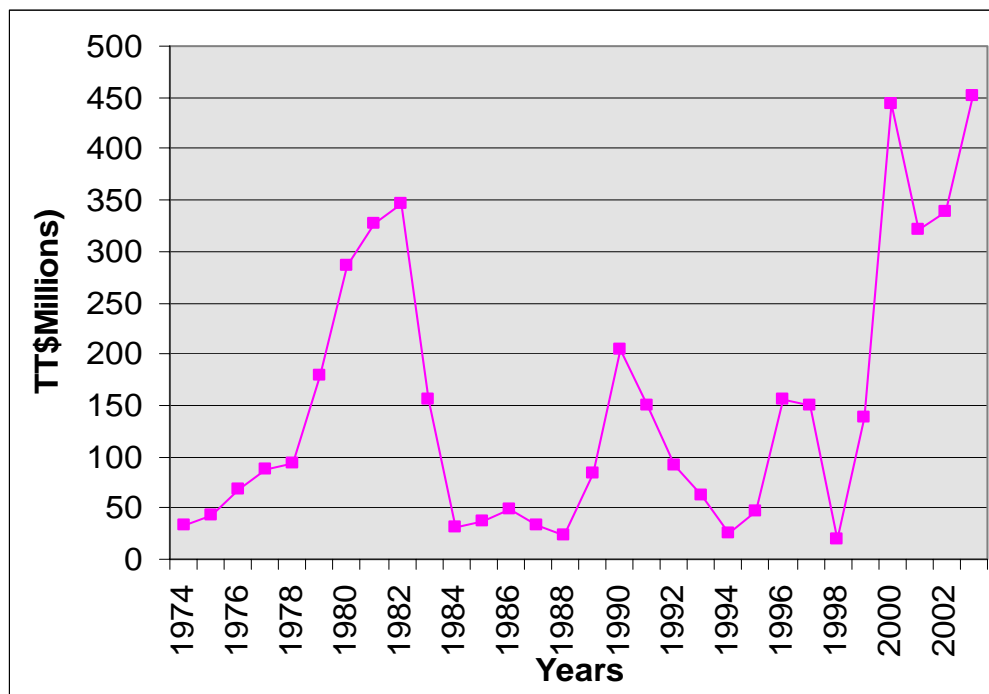


Chart 11 shows the trend in the gasoline subsidy paid to wholesalers over the period 1974-2003. The cyclical behavior and close correlation with oil prices as in the late 1970's and early 2000's is clearly evident.

## CHART 11

TRINIDAD AND TOBAGO  
PETROLEUM FUEL SUBSIDY ( 1974-2003)



The subsidy policy was introduced in 1974 to shield the economy from the effects of rising international oil prices. Since then, however, no attempt has been made to rationalize or to adjust the subsidy scheme to reflect present market value. Over the period, 1996-2004, the petroleum subsidy amounted to a whopping TT\$2.9 billion. Finance Minister Conrad Enill reported that in fiscal 2005 alone, the subsidy cost Government \$1.2 billion. The subsidy is estimated to reach \$1.5 billion in the fiscal year 2006.



## **Competition in Transportation Fuels Market**

The retailing of petroleum fuels in Trinidad and Tobago has a very colourful history with respect to competition. In the early years (pre 1963) there was an open competitive market involving the main multinational corporations engaged in the industry – Shell, BP, Texaco and Esso. Aggressive competition for market share led to the indiscriminate establishment of petrol service stations, particularly in the urban centres and allegations of malpractices on the part of public officials. The Government was forced to intervene.

Government appointed a Committee to undertake an in-depth examination of the economic viability of petrol stations under existing and likely conditions. The Committee recommended that, "...the Government should, through legislation, create orderly and equitable conditions under which the distribution of gasoline products in Trinidad and Tobago could function in a planned and equitable manner. The proposed legislation would seek inter alia, to prevent any undue losses to the Government from the consequences of destructive competition between the Wholesalers and the Dealers; to guard against malpractices connected with the distribution of petroleum products; to create a just equilibrium between the four Wholesalers and to stabilize the retail trade in gasoline in the interest of the rank and file of the Petroleum Dealers, the consuming public, and employees working at gasoline stations." By 1969, the State was quite willing to acquire the assets of BP and subsequently place the retail operations of all companies under the control of NPMC.

In 1996, thirty years later, the Petroleum Retail Committee in their final Report on a study of the Retail Marketing of Petroleum in Trinidad and Tobago questioned whether continued involvement of the state was necessary, or even prudent. The report made it clear that de-regulation of the market was the best course of action, and would indeed be capable of yielding the best benefits to all parties involved. Moreover, the Report concluded that the State had failed to meet many of its own stated requirements as set out in their retail market policies, especially in terms of product quality control, environmental degradation and optimal distribution network.

The report noted widespread dissatisfaction about the state-controlled market among stakeholders – consumers, wholesalers, retailers and suppliers alike. Some 69% of people surveyed in 1996 by Market Facts & Opinions supported opening up the local retail sector to new entrants. “Customer interests in lower prices could also be met by the market mechanism, as a de-regulated market was probably the best way to achieve competitive prices.”

Wholesalers and retailers felt that, under the current arrangements, their margin on fuels was inadequate, and this was, in fact, a major contributor to the progressive deterioration of the distribution network. Petrotrin argued that ex-refinery prices were unfair to the refiner. The solution was either to establish a more appropriate pricing arrangement among the players, or allow the market to decide the levels of prices and respective margins.

In contrast, Government officials believed that “Demonopolisation would hurt NPMC’s ability in the fuel and lubes market and would jeopardize its ability to function as a support system to Government in fulfilling its social obligations.” If the NPMC had to exist under competitive terms, then the Committee felt greater co-operation between NPMC and Petrotrin needed to be fostered.

The recommendations of the Committee leaned toward the concept of Phased Deregulation, and mirrored the opinions of another 1996 study by MCT and Associates called ‘A New Regulatory Paradigm; From Regulation to Competition.’ The latter report concluded that privatization, or at least demonopolisation, offered the greatest benefits over time, and had proven an effective strategy in fuel distribution and marketing sectors internationally.

Indeed by the turn of the century, the MEEI had taken a policy decision to liberalize the retail fuel market. NPMC was to be given a few years to prepare for competition. A key element of the strategy was the modernization of its distribution network, most visibly

through the establishment of super stations inclusive of convenience stores or ‘Quick Shoppe’. Some service stations were upgraded to be more efficient, ergonomic, aesthetically pleasing and environmentally friendly. Convenience stores were introduced to increase their appeal in the face of expected foreign competition.

However, with the subsequent change of government in 2002, the policies toward liberalization seem to have gone into abeyance. Three factors seem to have contributed to the stalled effort. First, there has been a distinct lack of interest in the domestic retail sector by the multinationals. Many argue that this is because the wholesale/ retail margins are too low to attract these companies to return to Trinidad. Secondly, the current Government believes that if it leaves the market to itself, remote areas that would not be profitable to private sellers would fall off the distribution grid, disadvantaging the population there. The argument is made that NP’s larger station network realizes diseconomies of scale. Thirdly, the State’s ideology is that the subsidy is one of the tangible means by which the populace can directly benefit from the hydrocarbon boom.

The above factors suggest that liberalization and demonopolization of the petroleum fuels market as envisaged by the 1996 Committee will remain on hold while the buoyant economic conditions persist.

## **5 Lessons of Experience**

The Trinidad and Tobago case study revealed some very interesting lessons, which are included in a separate document.

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