

**A REPORT OF  
THE TRINIDAD AND TOBAGO  
SUSTAINABLE DEVELOPMENT NETWORK  
(SDNTT)**

**A Guide for Monitoring the Management of Oil and Gas Resources in  
Trinidad and Tobago**

*Gregory McGuire, Dennis Pantin, Dale James and Navin Seeterram*

**Heritage and Stabilisation Fund: Did We Get It Right?**

*Gregory McGuire*

**A Sustainable Development Planning Framework for  
Mega-Projects in Small Places**

*Dennis Pantin*

**NOVEMBER 2009**

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**A GUIDE FOR MONITORING THE MANAGEMENT OF OIL  
AND GAS RESOURCES IN TRINIDAD AND TOBAGO**

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**DALE JAMES AND NAVIN SEETERRAM**

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## List of Acronyms/Abbreviations

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AES: Annual Economic Survey (of Trinidad and Tobago)  
ALNG: Atlantic Liquefied Natural Gas (Company)  
BG: British Gas  
BHP: BHP Billiton  
BP: British Petroleum (Company)  
CNC: Caribbean Nitrogen Company  
CSO: Central Statistical Office (of Trinidad and Tobago)  
CSR: Corporate Social Responsibility  
EIA: US Energy Information Administration  
EOG: EOG Resources (Energy Opportunity Growth)  
FDI: Foreign Direct Investment  
FEE: Foreign Exchange Earnings  
GDP: Gross Domestic Product  
GSTT: Geological Society of Trinidad and Tobago  
H&SF: Heritage and Stabilization Fund  
LNG: Liquefied Natural Gas  
MHTL: Methanol Holdings Trinidad Limited (Company)  
MNC: Multinational Corporations  
NGC: National Gas Company (Trinidad and Tobago)  
NGL: Natural Gas Liquids  
NGO: Non-Government Organization  
Repsol: Repsol /YPF (Company)  
SEDU: Sustainable Economic Development Unit  
SDN: Sustainable Development Network  
T&T: Trinidad and Tobago  
TT\$: Trinidad and Tobago Dollar

### **Units**

BOE/d: Barrels of oil equivalent per day  
BOPD: Barrels of oil per day.  
BPD: Barrels per day.  
Bcf: Billion cubic feet  
Btu: British Thermal Unit.  
Mm cu/ft: Million cubic feet.  
Scf/d: Standard cubic feet per day.  
Tcf: Trillion cubic feet.

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## 1. INTRODUCTION

This report is meant to provide the people of Trinidad and Tobago with a guide to information that would support meaningful participation of civil society in the management of our hydrocarbon resources. It is aimed at reaching the widest possible cross-section of people through multiple distribution channels. These include:

- The organizations comprising the Sustainable Development Network, principal clients of this study;
- Other civil society organizations; and
- The general public.

This document will be available in hard and electronic copy. Three main questions inform this study.

- Why do we, the people of Trinidad and Tobago, need to be informed of what is happening to our hydrocarbon-based oil and natural gas resources?
- What do we need to know?
- Where do we find the information?

Most of this study is devoted to answering the second and third questions. At the outset, however, we must remind ourselves of the reasons information on the state and the use of our oil and gas resources ought to be available to the public.

## 2. WHY DO WE NEED TO KNOW?

Here are four good reasons we need to know:

### *2.1 Property Rights Reason*

It is an established fact that the stability and continuity of a market economy depend on the protection of property rights. International law and conventions seek to protect all forms of property rights, including those of foreign investors, rights of intellectual property, etc.

Now, who owns the oil and natural gas resources of T&T? The answer is simple. Those resources are owned in common by all citizens and therefore constitute the national patrimony. We own them. The State acts as the trustee or custodian—not owner. It therefore has a responsibility and duty to inform us, the owners and hence shareholders, about the situation of the resources. We are also entitled to be involved in the decision-making process regarding the uses of these resources.

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## *2.2 The Oil and Gas Economic Dependence Reason*

The economy is highly dependent on the fortunes of the hydrocarbon sector, in ways that this report will later detail. Several studies show that the economies of countries with hydrocarbons and/ or minerals have performed poorly when compared with those of countries at roughly the same stage of economic development but with no such resources. (This is sometimes called the **Resource Curse**). Moreover, resource-rich countries are prone to experience distortions in the non-resource sectors of their economies, particularly during periods of resource booms. This phenomenon was first identified in a study of Venezuela by Dudley Seers with the suggestion that it was applicable to other mineral producers such as Trinidad and Tobago. Later it has become more popularly known as the **Dutch Disease** following the experience of Holland. As a hydrocarbon-dependent economy, T&T is highly vulnerable to the **Resource Curse** and the **Seers syndrome/ Dutch Disease**. Our own economic self-interest, then, requires us to understand how the hydrocarbon sector operates.

## *2.3 The Finite, Exhausting Resources Reinforcing Reason*

We ought to know not only because of our property rights and our heavy dependence on the fortunes of the hydrocarbon sector, but also because the resources are exhausted as they are used. Unless we continue to find additional reserves of hydrocarbons, they will ultimately be completely used up. So we are highly dependent on resources which we own but which are depleting as we speak.

## *2.4 Role of all relevant stakeholders*

The energy sector is dominated by large international corporations. In negotiations with such corporations, and in general management of energy sector, the capacity of the public authorities is limited. As a result, loopholes are often exploited to the detriment of the national interest. This situation makes the role of civil society even more important. Civil society involvement in resource management issues depends on the availability and analysis of relevant information. It is hoped that this document will contribute to meeting the need for information and analysis.

## **3. WHAT DO WE NEED TO KNOW?**

About eight main sets of information ought to be widely available to the public.

- How dependent are we on oil and natural gas production? More particularly, how much does the hydrocarbon sector contribute to Gross Domestic Product (GDP) and to the balance of payments? In particular, from the exploitation of our hydrocarbon

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resources, how much revenue are we retaining nationally as net foreign exchange earnings and national gains, including but not limited to government revenue (tax and profit income), and employment? What are the key factors that determine these flows?

- How much oil and gas do we have and, based on current and projected rates of use, how long will they last?
- How are we using these resources; that is, what types of outputs are being produced and exported, in what quantities and by whom?
- In terms of value, how much of the inputs (of goods and services) required by the firms for production are sourced locally, and how much sourced abroad?
- Are we receiving the highest feasible level of national return from our oil and gas resources<sup>1</sup> in terms of:
  - Domestic value added;
  - Foreign exchange earnings and national revenue;
  - Building national capacity?
- What are the collective impacts (social, economic and environmental) of hydrocarbon utilization<sup>2</sup>?
- Are we investing captured economic rents in an effort to stave off short-run impacts of price fluctuations and, more importantly, to diversify the economy in order to avoid the inevitable medium to long-run impacts of declining production and prices? (The Heritage and Stabilization Fund<sup>3</sup>)
- What are the legislative framework and the governance structure within which the industry operates<sup>4</sup>?

### **3.1 The Available Information**

One feature of oil and gas management in Trinidad and Tobago is that substantial data are available. The information needs to be in a form that is easily accessible to civil society, and members of the public need to know where to find it. Drawing upon

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<sup>1</sup> This question is distinct from Question 1 which simply seeks to establish the facts with respect to what we are receiving. Question 6 now seeks to relate the actual to the feasible, possible and desirable.

<sup>2</sup> There will be a separate paper on planning for mega-projects as part of this project.

<sup>3</sup> The Heritage and Stabilization Fund will be the subject of a separate paper as part of this project.

<sup>4</sup> The issue of Governance will also be the subject of a separate paper.

available information and knowledge, this section provides answers to the eight questions above.

### 3.1.1 How dependent are we on oil and natural gas industries?

The level of the economy's dependence can be assessed by the contribution of the oil and natural gas industries, (called "the energy sector"), to GDP, government revenue, export earnings, employment and gross capital formation. However, Table 1 indicates the percentage the energy sector has contributed in each macro-economic category between 2002 and 2008. The data are published in this form in the Central Bank's Annual Economic Survey. ([www.central-bank.org.tt](http://www.central-bank.org.tt))

The data show increasing reliance on the energy sector over the five years. In direct employment, however, the sector's share has remained relatively flat in spite of its rapid expansion over the period.

**Table 1: Economic Contribution of Energy Sector 2003- 2008 (Percentage)**

| ITEM                | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 <sup>P</sup> |
|---------------------|------|------|------|------|------|-------------------|
| GDP                 | 36.0 | 38.4 | 39.4 | 42.4 | 40.9 | 39.6              |
| Government Revenues | 42.8 | 41.1 | 52.7 | 61.9 | 55.5 | 57.8              |
| Merchandise Exports | 83.3 | 85.8 | 85.9 | 91.0 | 86.7 | 88.2              |
| Employment          | 3.2  | 3.6  | 3.4  | 3.5  | 3.7  | 3.3               |

Notes: p- provisional

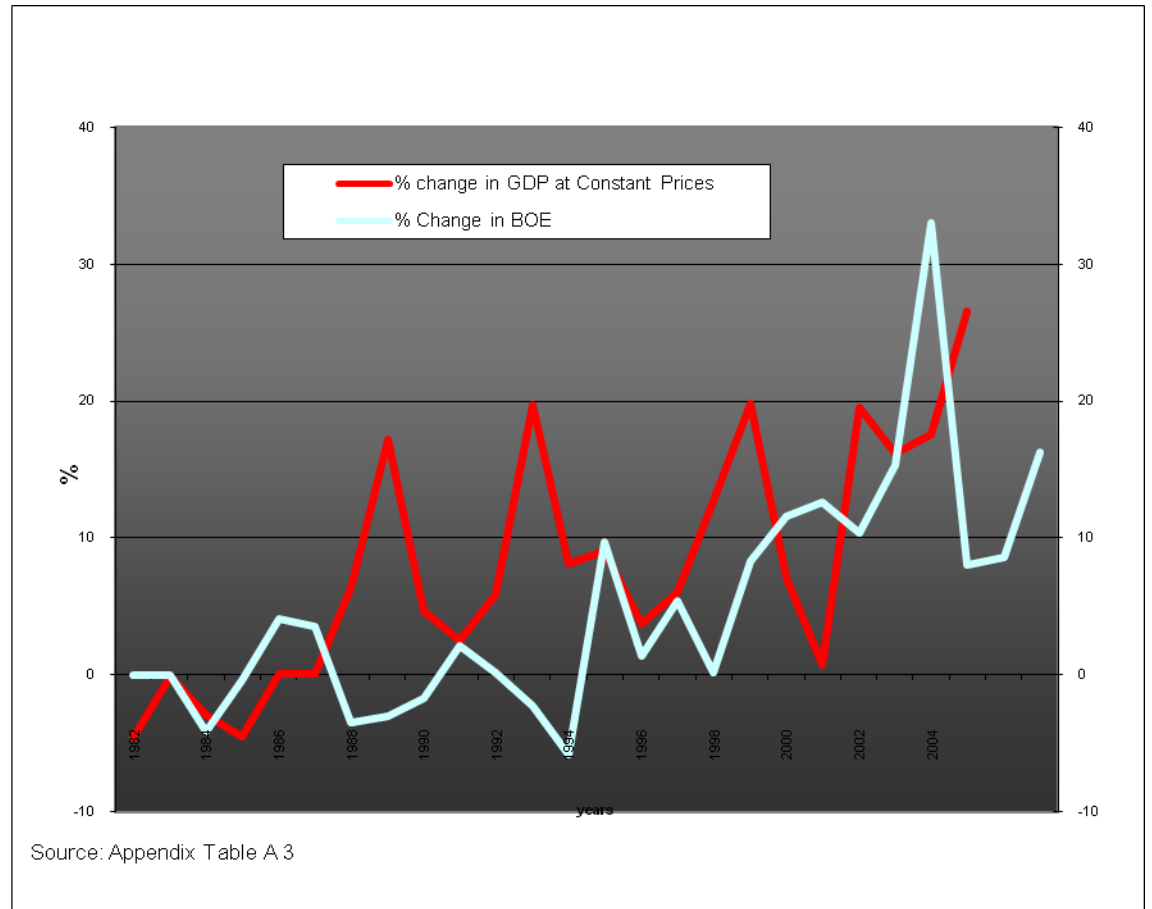
Source: Annual Economic Survey, 2006 – 2008: [www.central-bank.org.tt](http://www.central-bank.org.tt)

### 3.1.2 Gross Domestic Product

Gross Domestic Product (GDP) is a measure of the value of goods and services produced in Trinidad and Tobago usually over a year. Figure 1 below illustrates the relationship between oil and gas and GDP from 1982 to 2007. Changes in GDP strongly correlate (follow) changes in oil and gas output, measured together

as Barrels of Oil Equivalent (BOE)<sup>5</sup>. GDP rises and falls as output of oil and gas moves up and down.

Figure 1: Changes in Total and Energy GDP



<sup>5</sup> 1 Barrel of Oil Equivalent (BOE) is equivalent to 5.8 thousand cubic feet of natural gas (Mcf)  
1 boe=5.8 Mcf

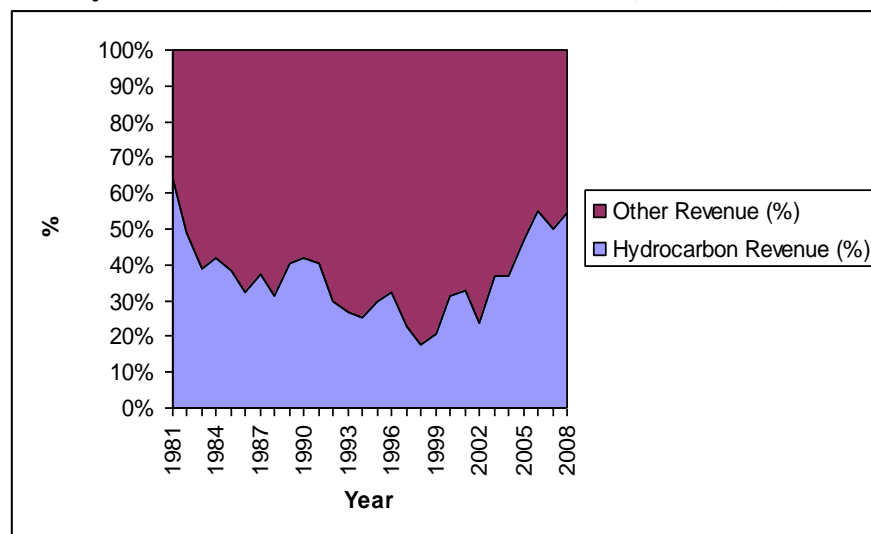
### 3.1.3 Government Revenue

Hydrocarbon revenues, as reported in the government statistics, comprise taxes and royalties paid to the government under the Petroleum Taxes Act. This category of revenue includes only payments made by companies in the exploration and production business and the refining business (Petrotrin). It does not include payments to the government by Atlantic LNG, the petrochemical industry, or the National Gas Company. These businesses fall under the Income Tax Act and their payments are not counted as part of government hydrocarbon revenue!

Figure 2, based on Appendix -Table A4 shows the share of hydrocarbon revenue in total government revenues from 1981 to 2008. Several features of the data should be noted:

- The government's revenue dependence on hydrocarbons remained strong, in excess of 30%, even in 1986-1987 when prices were lowest.
- The share of hydrocarbon revenue after 2006 climbed back to the level of dependence experienced in 1981—the peak year of the earlier oil boom.
- Revenues from oil and gas are reported together, making it difficult to accurately separate the contribution of oil from that of gas. It is known, however, that in 2001 and 2002, revenue from gas surpassed that from oil (See figure 3). Since then, the ratio may have been altered because oil prices have nearly quadrupled.
- Natural gas taxation from downstream industries is reduced by tax incentives granted in the form of tax holidays and duty-free concessions. These incentives usually run for five to 10 years.

**Figure 2: Share of Hydrocarbon Revenue in Total Revenue (1981-2008)**



Source: Appendix Table A4

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**Box 1 provides summary details on the petroleum taxation system.**

**BOX 1**  
**System of Hydrocarbon Taxation**  
*(Adopted from the website of the Ministry of Energy)*

The fiscal regime in Trinidad and Tobago can best be described as an enhanced two-tier system consisting of production-based Royalty, Production Levy and Supplemental Petroleum Tax (S.P.T.), supported by a profits-based corporation tax which includes the Petroleum Profits Tax (P.P.T) and an Unemployment Levy. Incentives and allowances are structured into the system to encourage investment, particularly in exploration projects and in enhanced oil recovery schemes.

The petroleum taxation system was revised in 1992 to improve its competitiveness by providing additional relief to new investors, and a S.P.T. rate structure sensitive to oil price variation. The system includes the following:

- A Royalty charged at a rate of 12.5% of all petroleum produced.
- A Production Levy of up to 3% of gross income from crude oil. The Petroleum Levy and Subsidy Act determine the Petroleum Production Levy which is charged on companies which produce crude oil. The Levy provides the subsidy for petroleum products sold on the domestic market.
- A Supplemental Petroleum Tax (S.P.T.) charged on production of crude oil and based on an oil price sensitive rate structure. This ranges from 0% for crude prices under US\$13.01 a barrel to a maximum of 35% for crude prices in excess of US\$49.50 a barrel.

Supplemental Petroleum Tax is computed on gross income from crude oil less allowances for royalty payments and various expenditures incurred in exploration and development activity. In addition, companies are eligible for a "productivity allowance", equivalent to a 20% reduction in S.P.T. rate, on all production in excess of 90% of the preceding year's average. A "small field" allowance equivalent to a 20% reduction in the S.P.T. rate is also granted for fields in which the production rate is less than 200 barrels a day for each well.

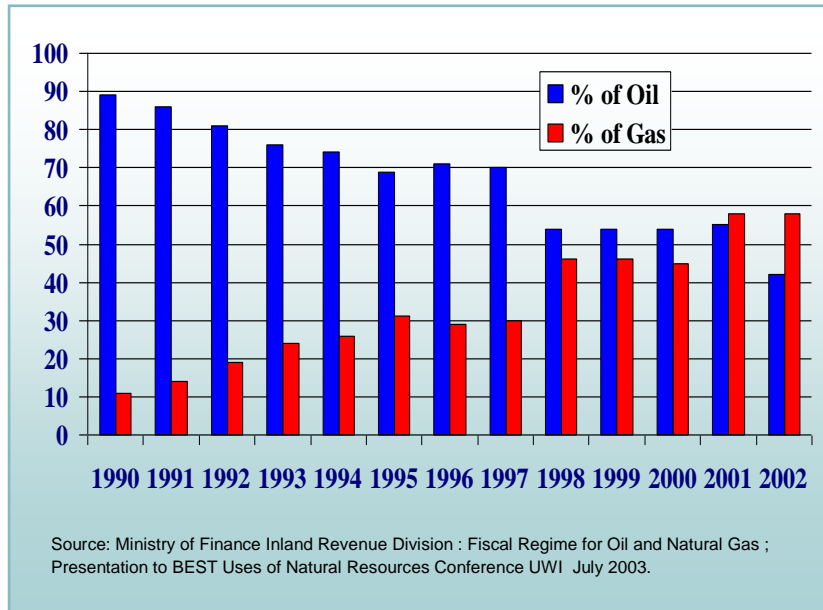
- A Petroleum Profits Tax (P.P.T.) or corporation tax charged at a rate of 50% of gross revenues from all sources less deductible expenses and allowances.
- An Unemployment Levy of 5% is also charged. Eligible deductions include operating and administrative expenses; royalty, production levy and S.P.T. payments; capital allowances (depreciation); and a heavy oil allowance on projects designed to recover crude of 18 degrees API specific gravity or lower.

For the computation of supplemental petroleum taxes (SPT), the following allowances are written off:

- A geological and geophysical allowance up to 50% of geological and geophysical costs
- An exploration allowance up to 100% of direct costs of drilling exploration wells
- An incremental investment allowance up to 40% of direct intangible drilling costs and 40% of tangible costs incurred in development activity and
- Royalty payments.

Additionally, capital allowances, as provided under the Income Tax (in Aid of Industry) Act are also applicable as well as other concessions that may be given under the Customs Act and Value-Added Tax Act.

**Figure 3: Oil vs. Gas % of Revenue**

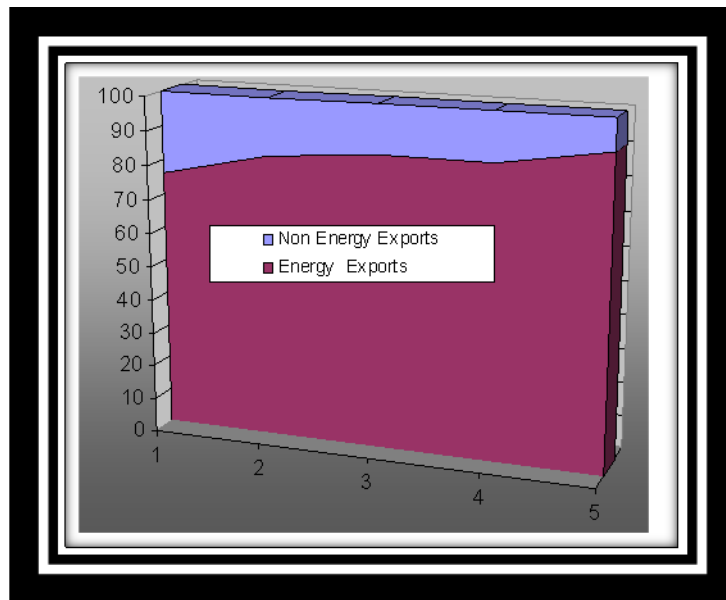


### 3.1.4 Foreign exchange earnings

Export earnings (of foreign exchange), including exports from oil, LNG and petrochemicals, depict a more representative picture of the sector than does the government revenue statistic. Figure 4, based on Appendix - Table A5, shows the historical share of hydrocarbons exports in total export earnings. The share of hydrocarbons in foreign exchange earnings in 2007 was equivalent to the level experienced in 1981, when it had peaked at about 90.2%.

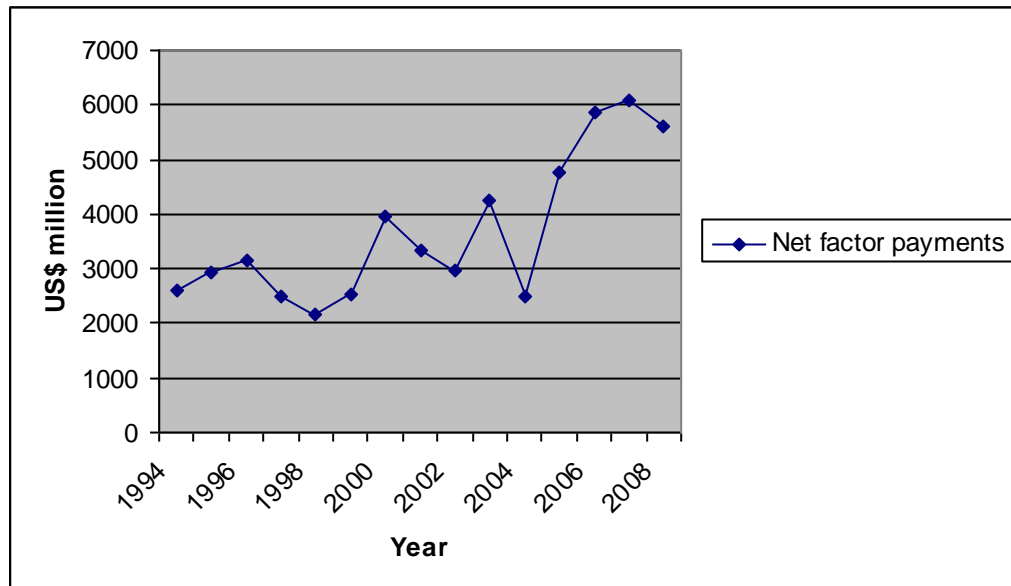
Part of the foreign exchange earned is subsequently repatriated by foreign-owned firms in the form of profits and other payments to shareholders abroad. Such payments are recorded in the Balance of Payments—Services Account as “Net Factor Payments”, or “Net Investment Incomes.” The data are not disaggregated to determine the exact share of the energy sector. Given the dominance of the foreign firms, however, it is reasonable to assume that the energy sector companies account for the bulk of these outflows, which amounted to US\$964 million in 2007, up from US\$397 million three years earlier.

**Figure 4: Energy vs. Non Energy Exports**



Source: Appendix Table A5

**Figure 5 Net factor Payments (1994-2008)**

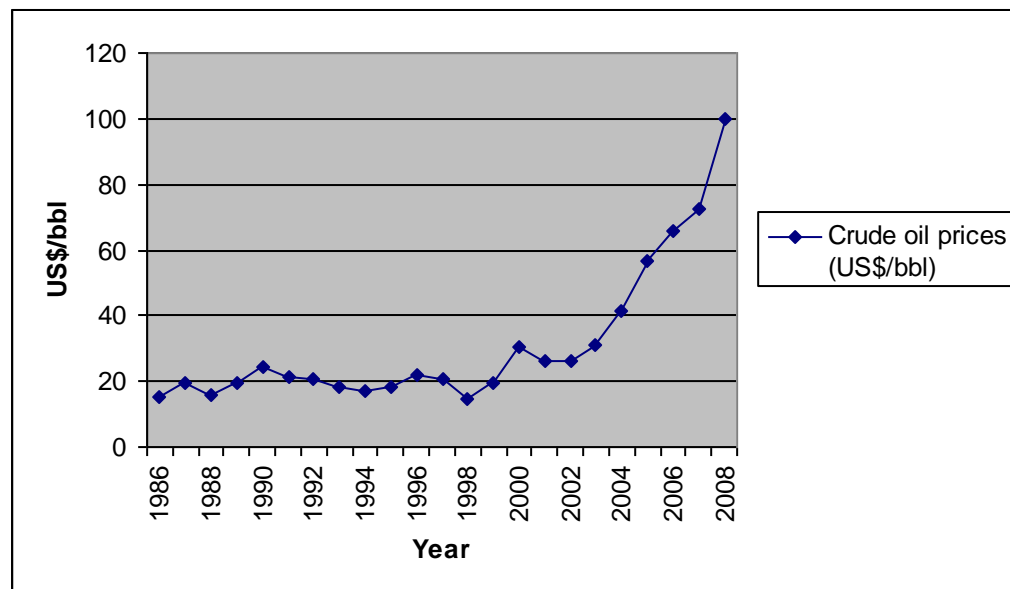


Source: Appendix Table A5

### 3.1.5 Oil and Gas Prices

A familiar feature of the annual Budget presentations and subsequent discussions is the concern with the likely prices of oil and gas. International market prices are the most volatile and unpredictable factor in the determination of government revenue from oil and gas. Prices are generally determined by international market conditions. Figure 6 shows oil prices from 1986, as represented by West Texas Intermediate (WTI) marker crude. A steady upward climb from 2002 is evident. However, prices came crashing down from a peak of US\$149/bbl in July 2008 to under US\$ 50/bbl by year end. Crude oil of the various grades produced in Trinidad and Tobago does not command the same price as WTI. Crude produced in the East coast marine area— “Galeota Blend”—fetches a price of about US\$ 8-10/barrel less than WTI, while land and South West Coast Marine crude sell for about US\$ 20/ barrel less. As a rule of thumb the average price of Trinidad and Tobago crude is about 20% below the price of WTI.

Figure 6 Crude Oil prices 1986-2008



Source: Appendix Table A1

In the case of natural gas, the relevant gas price for making estimates of Government revenue has been the subject of much debate and conjecture. The gas price relevant to the Budget calculations is the the average well head price of natural gas in Trinidad and Tobago , which is the price at which the companies’ revenue and tax base is determined. However, the average well head gas price has several components the most important of which are:

- 
- i. The LNG netback price from the USA ( 30%)
  - ii. The LNG netback price from Europe( 25%)
  - iii. The average price from domestic market sales to petrochemical markets( 25%)
  - iv. The average price from sales to other domestic markets.

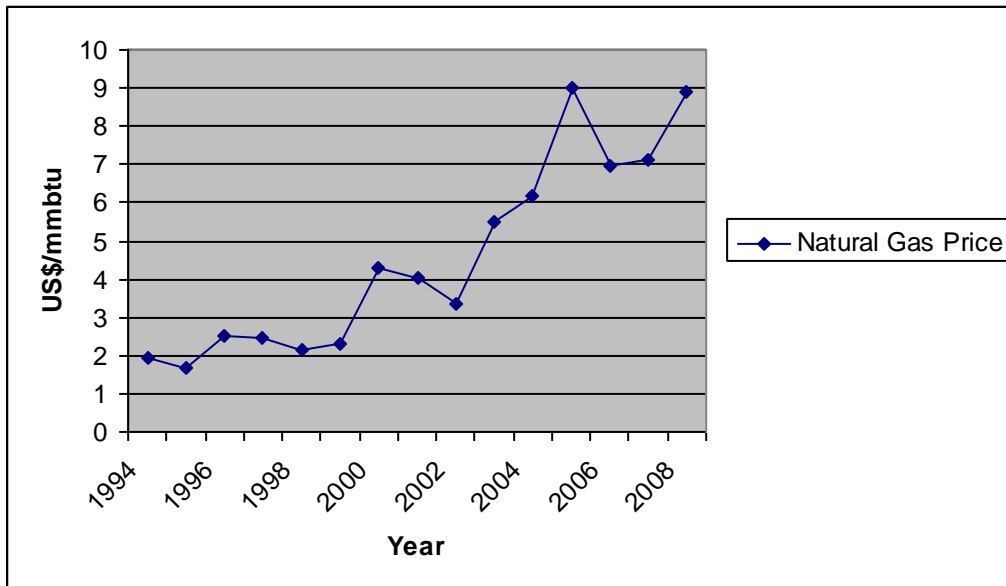
Figure 7 shows natural gas prices at the most popular trading point in the US: Henry Hub<sup>6</sup>. Henry Hub prices indicate trends in LNG selling prices in the US market. The well-head price of gas sold as LNG to the US market may be estimated by taking about 55 to 60 per cent of the US market price. Prices for LNG cargoes to Europe are determined on a different pricing basis<sup>7</sup>, linked to the price of oil and a basket of alternative energy sources. Between 2003 and 2008, the essential story in the natural gas market is that prices have been trending upward to new record levels, though not at the alarming rate of oil prices. Like all most other commodity prices, international gas prices came crashing down by third Quarter 2008. For the fiscal year 2008-09 the Henry Hub price averaged US\$4.53/mmbtu.

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<sup>6</sup> Henry Hub is a major gas collection and interconnection facility in Southern Louisiana US. Henry Hub is owned and operated by Sabine Pipeline LLC, which is a wholly owned subsidiary of Chevron Texaco. The Henry Hub is physically located at Sabine's Henry Gas Processing Plant in Louisiana. The Henry Hub interconnects nine interstate and four intrastate pipelines. Collectively these pipelines transmit gas to meet demand in the North East, South East and Midwest states.

<sup>7</sup> For more information on gas pricing see Gregory McGuire "Understanding Gas Pricing" Gasco News Vol 16 # 3. 2003.

**Figure 7: Natural Gas Spot Prices 1994-2008 (US\$/MMbtu)**

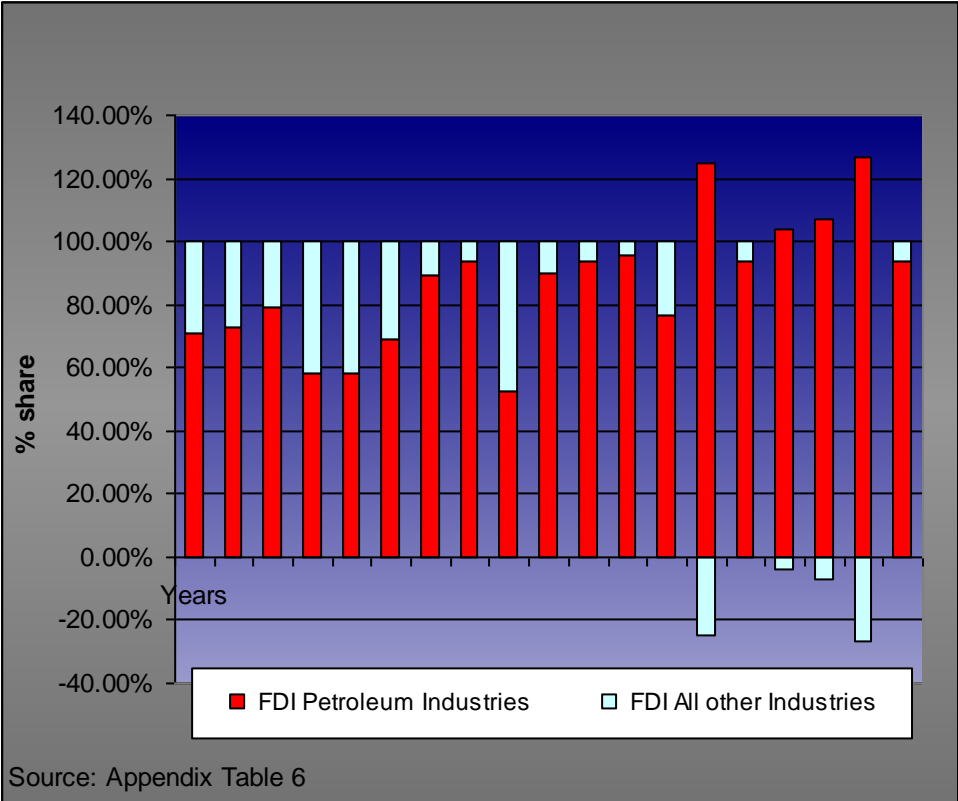


**SOURCE: EIA**

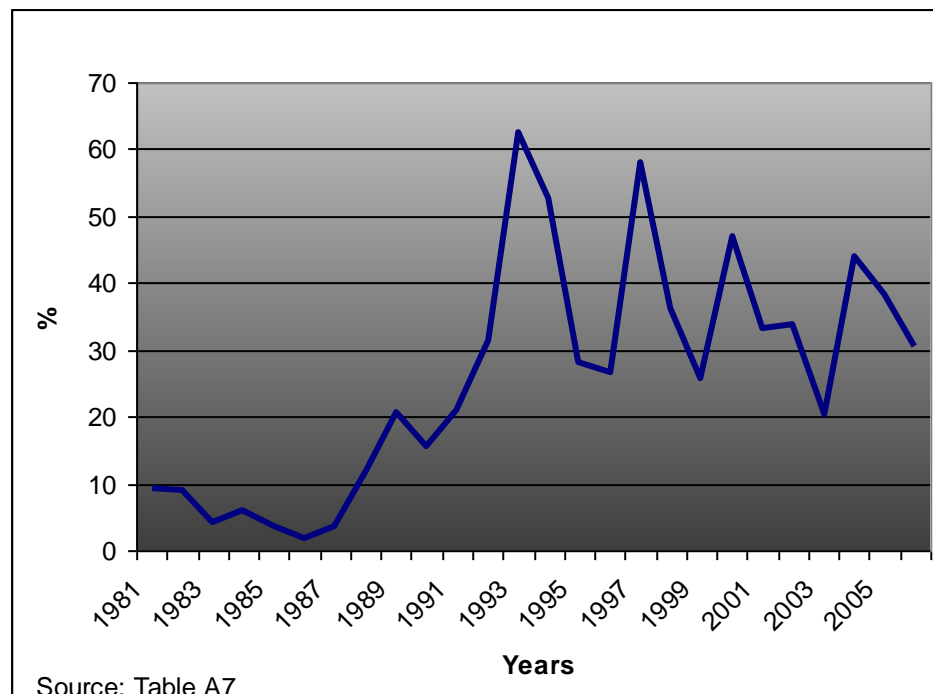
### **3.1.6 Foreign Direct Investment (FDI)**

Figures 8 and 9, drawn from Appendix tables 6 and 7, show the contribution of the energy sector to investment and capital formation. The oil and gas sector has traditionally attracted the lion's share of Foreign Direct Investment, but this has grown even more significantly over the last 15 years, given the investments which have been made in LNG, methanol and ammonia. Appendix Table 75 compares trends in Gross Fixed Capital Formation (Total National Investment) with Foreign Direct Investment over a similar period. Foreign direct investment rose in significance over the last eight to ten years. Indeed, since 1992, foreign capital has played a larger role in the economy than it had in the 1970s. Figure 9 below shows the trend in the share of foreign direct investment in gross capital formation in Trinidad and Tobago.

**Figure 8: Oil Share of Foreign Direct Investment**



**Figure 9: FDI as a % of Gross Capital Formation**



### 3.1.7 Key Information Sources

The extent of economic dependence on oil and gas can be gleaned from the macro-economic statistics in the publications listed below. The data are also available on the websites of these institutions.

*Sources of information:*

- Central Bank of Trinidad and Tobago (Annual Economic Surveys for Various Years) [www.central-bank.org.tt](http://www.central-bank.org.tt)
- Central Bank of Trinidad and Tobago. Summary of Key Economic Indicators-  
[www.central-bank.org.tt](http://www.central-bank.org.tt)
- Central Statistical Office: Trinidad and Tobago Balance of Payments Reports Various Issues. Central Statistical Office [www.cso.gov.tt](http://www.cso.gov.tt)
- Ministry of Finance, Review of the Economy [www.finance.gov.tt](http://www.finance.gov.tt)
- US EIA <http://tonto.eia.doe.gov/dnav/pet/hist/rwtca.htm>
- South Trinidad Chamber of Industry and Commerce- Petroleum Congress Proceedings [www.southchamber.org](http://www.southchamber.org)
- Ministry of Energy and Energy Industries: Annual Reports. [www.energy.gov.tt](http://www.energy.gov.tt)
- International Monetary Fund (IMF) Country Reports; Article IV consultations <http://www.imf.org/external/np/sec/pn/2007/pn07127.htm>

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## 3.2 Oil and gas resources: how much; how long?

Ultimately, the long-term viability of the T&T hydrocarbon sector depends on its reserves. The definition of reserves, the timing and the method of doing updates, and the approach to winning new reserves are essential to enhancing public understanding of this question.

Hydrocarbon reserves are classified into three groups.

- **Proved Reserves**<sup>8</sup>: Those quantities of petroleum which, by analysis of geological and engineering data, can be estimated with a reasonable degree of certainty to be commercially recoverable from known reservoirs under current economic conditions, operating methods and government regulations.
- **Probable Reserves**: Those unproved reserves which analysis of geological and engineering data suggests are more likely than not to be recoverable (*that is, 50-per cent probability*).
- **Possible Reserves**: Those unproved reserves which analysis of geological and engineering data suggests are less likely to be recoverable (*that is, 10 per cent*).

### 3.2.1 Oil Reserves

Over the last 12 years, T&T oil reserves have grown as a result of increased exploration, spurred in part by the search for natural gas to supply the new LNG industry. A major success came in 2001 with the discovery by BHP Billiton of the Angostura field; it was the first major oil discovery in over three decades.

Table 2 below shows the oil reserves figures for selected years. Figure 11 shows the country's proven oil reserves against the reserves-to-production ratio. The increase in reserves from around 2000 reflects the presence of oil in new gas fields, peaking with Angostura field discoveries between 2001 and 2003. Over the last two years, however, the steep decline is due in part to a reassessment of the size of oil reserves in new fields. An interesting feature of this chart is that the reserves-to-production ratio has remained within a 10 to 20 year band from 1976

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<sup>8</sup> Proved, Probable and Possible Reserves as defined by the Society for Petroleum Engineers [www.spe.org](http://www.spe.org)

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to the present (Appendix - Table 8). It should be noted, however, that significant portions of our marine areas have not yet been explored.

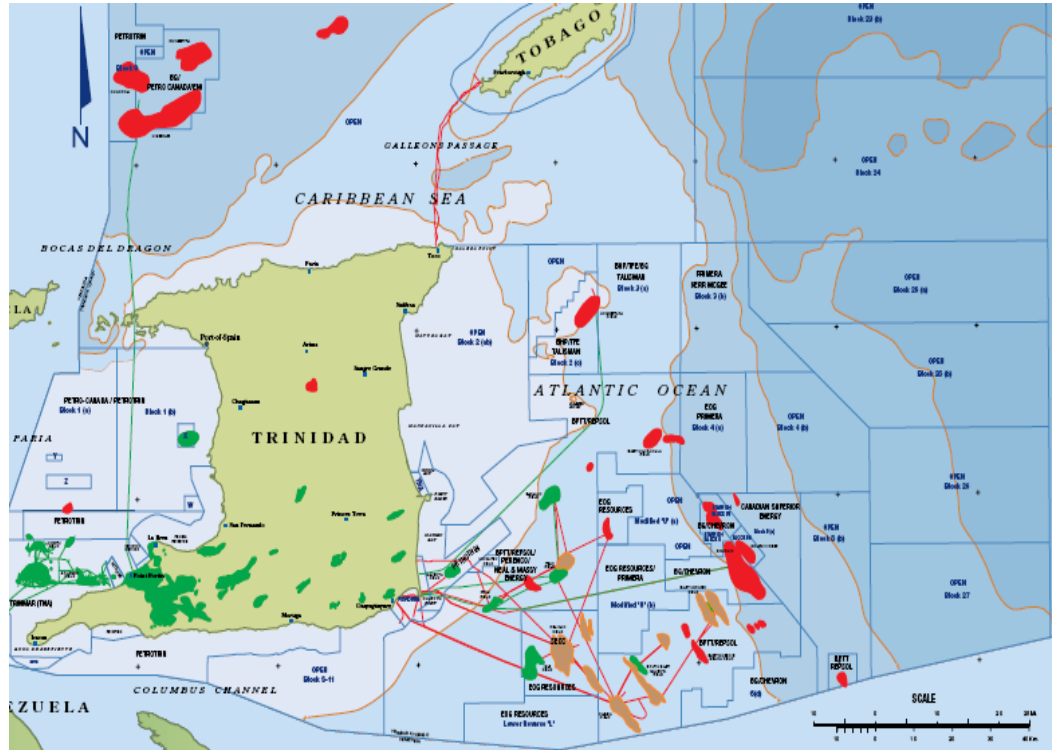
**Table 2:**

**Oil Reserves Selected Years (MMBO)**

|          | 1995        | 2000        | 2004        | 2006        |
|----------|-------------|-------------|-------------|-------------|
| Proved   | <b>551</b>  | <b>716</b>  | <b>756</b>  | <b>605</b>  |
| Probable | <b>381</b>  | <b>460</b>  | <b>358</b>  | <b>321</b>  |
| Possible | <b>2300</b> | <b>1924</b> | <b>1644</b> | <b>1560</b> |
| Total 3P | <b>3232</b> | <b>3100</b> | <b>2758</b> | <b>2486</b> |

Source: Ministry of Energy and Energy Industries [www.energy.gov.tt](http://www.energy.gov.tt)

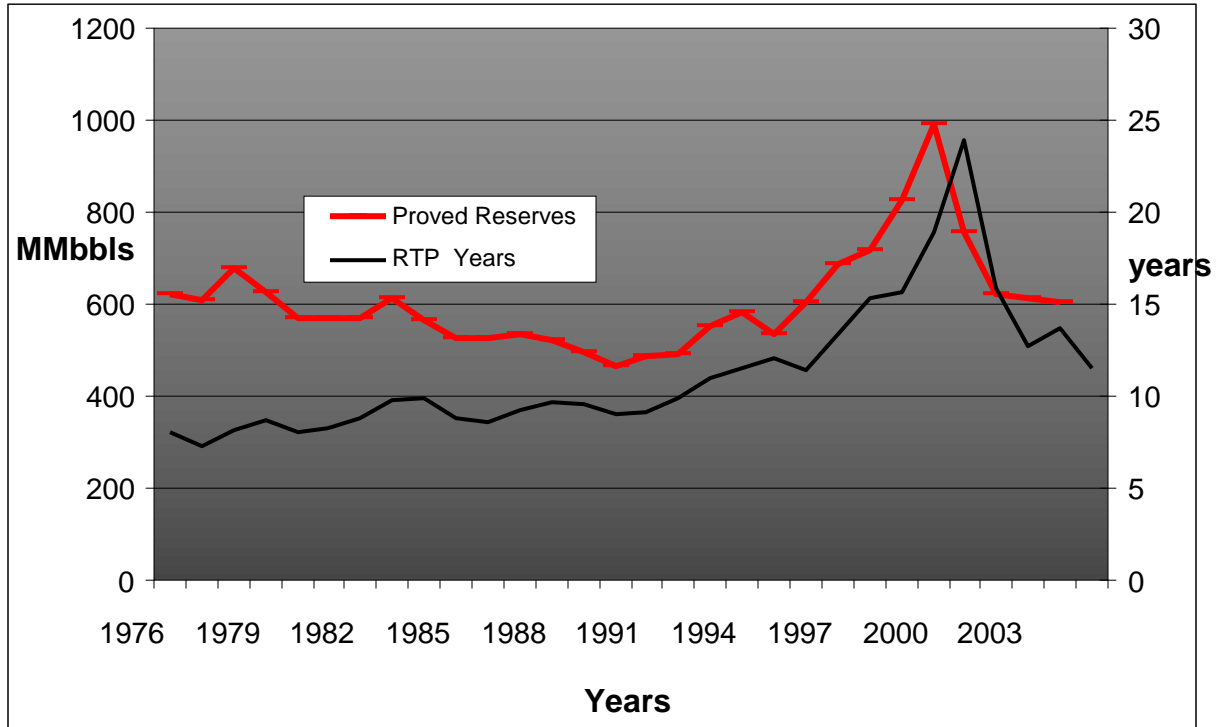
Figure 10: Trinidad and Tobago Offshore Concessions Map



Sources: Ministry of Energy and Energy Industries, Atkins Integrated Oil and Gas

Solutions: [http://downloads.pennnet.com/os/posters/2006\\_07trinidadmap.pdf](http://downloads.pennnet.com/os/posters/2006_07trinidadmap.pdf)

**Figure 11: Crude Oil Proved Reserves and RTP**



Source: Appendix Table A8

### 3.2.2 Natural Gas Reserves

Figure 12, drawn from Appendix - Table A 11, charts T&T gas reserves over the 30-year period from 1976 to 2006. The graph shows overall growth. During the period 1981 to 1992, however, proved gas reserves were in decline partly because of lack of exploration. During that period, the reserves-to-production ratio was in excess of 50 years. A steep increase in gas reserves after 1992 was driven primarily by increased demand in the domestic market, stimulated by expansion in the petrochemical sector. The greatest stimulus for new exploration, however, was provided by the LNG business in Trinidad and Tobago and by the growth in international demand for gas. Proved gas reserves peaked in 2003 at 20.76 tcf. Since then, the rate of consumption has exceeded the rate of discoveries, resulting in a lowering of the reserves-to- production ratio.

Reserves of oil and gas are periodically certified by independent auditors. The latest audit, conducted by the firm Ryder Scott, estimated total natural gas reserves at 30.75 tcf, of which 16.99 tcf are classed as proved reserves. Based on current rates of depletion, the reserves-to-production ratio is now approximately 12.6 years. This estimate, however, refers only to known, proven reserves; it does

not take into consideration the possibility of finding new reserves from new exploration in coming years.

**Table 3: Natural Gas Reserves (tcf) Selected Years**

|   | 1993 | 1996 | 2003  | 2007  | 2008  |
|---|------|------|-------|-------|-------|
| Proved  | 8.2  | 12.3 | 20.76 | 17.05 | 16.99 |
| Probable  | 4.6  | 3.7  | 8.12  | 7.76  | 7.88  |
| Possible  | 1.1  | 2    | 5.85  | 6.23  | 5.88  |
| Total   | 13.9 | 18   | 34.73 | 31.04 | 30.75 |
| Source: <a href="http://www.ryderscott.com">http://www.ryderscott.com</a> |      |      |       |       |       |

**Figure 12 Natural Gas Proved Reserves and RTP (1976-2006)**

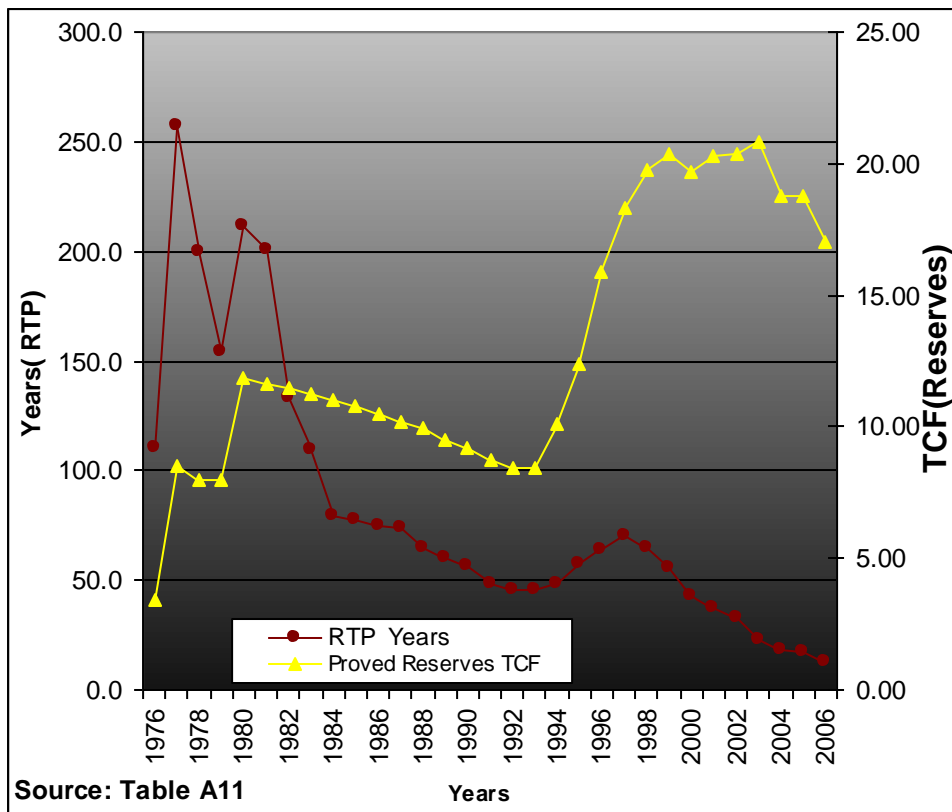
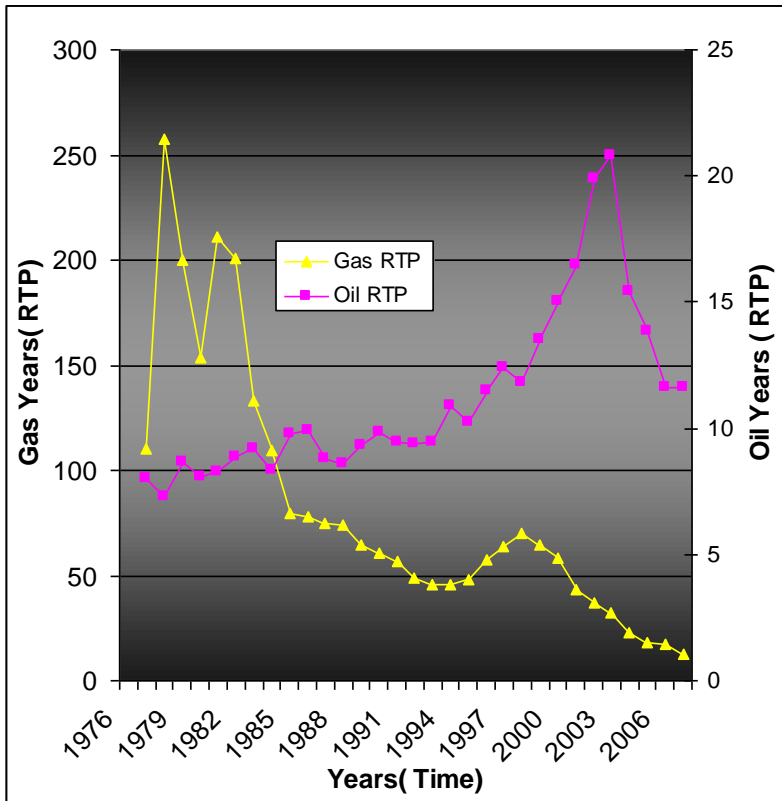


Figure 13: Oil and Gas RTP Ratios (1976 - 2006)



Source: Tables A8 and A11

### 3.2.3 Finding New Reserves

Through a process of competitive bidding, the Government facilitates the search for new reserves by granting exploration licenses to companies interested in exploration and production. Companies whose bids are successful are granted production sharing contracts<sup>9</sup> (PSC), by which the State agrees to take a share of

<sup>9</sup> A sample PSC is available on the Ministry of Energy's website: [www.energy.gov.tt](http://www.energy.gov.tt)

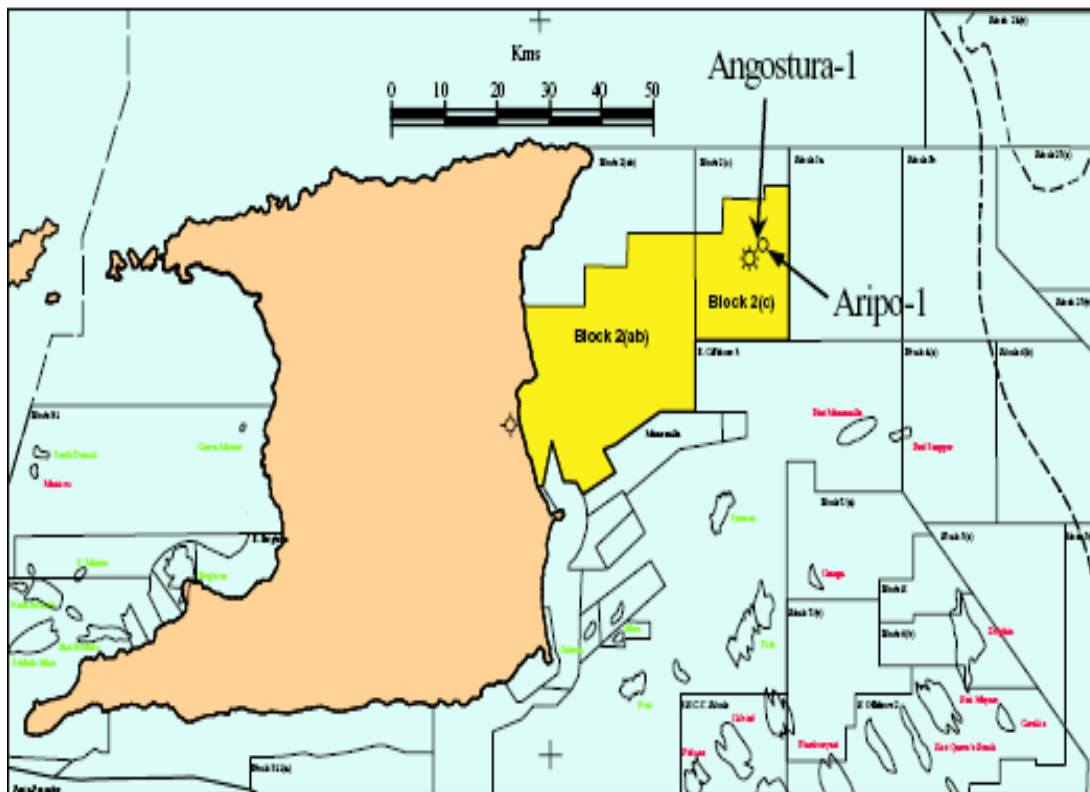
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production as payment for taxes and royalties. Appendix A - Table 7 provides a snapshot of production-sharing contracts offered in rounds of competitive bidding over the last 12 years. Some of these contracts have yielded positive results. One major success was the BHP Angostura area shown in Figure 14.

This information is available from the Ministry of Energy. The Minister keeps a register of all documents related to bid rounds. The map below identifies exploration blocks that have been, or are to be, put out for fresh bids.

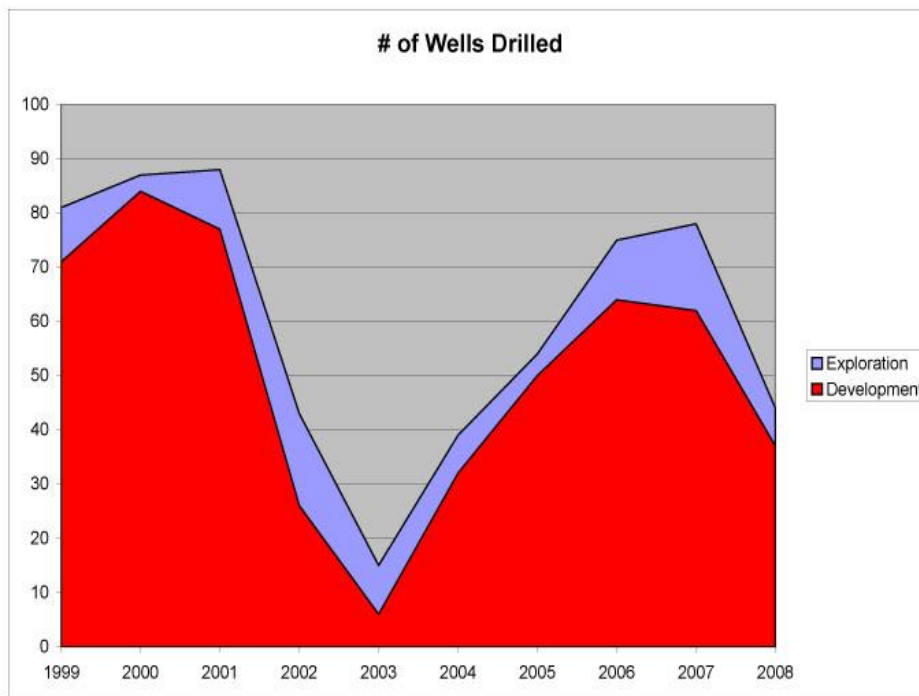
The number of rigs in operation and the number of wells drilled are useful measures of the level of interest or intensity of exploration in a particular area. Figure 15 shows the fluctuating trend in the number of wells drilled. Drilling has slowed appreciably over the last two years, despite the strong demand for petroleum in both local and foreign markets.

**Figure 14: T&T Concessions Map: BHP Discovery**



Source: <http://www.bhpbilliton.com/bbContentRepository/>

**Figure 15: Drilling Activity 1999-2008**



Source : GSTT [http://www.gstt.org/oil\\_gas/oilandgas.html](http://www.gstt.org/oil_gas/oilandgas.html)

### 3.2.4 Key Information Sources

- Central Bank of Trinidad and Tobago (Annual Economic Surveys for Various Years), Handbook of Key Economic Indicators [www.central-bank.org.tt](http://www.central-bank.org.tt)
- Ministry of Finance, Review of the Economy [www.finance.gov.tt](http://www.finance.gov.tt)
- Ministry of Energy and Energy Industries: Annual Reports. Registry of PSC Bids. [www.energy.gov.tt](http://www.energy.gov.tt)
- ***Geological Society of Trinidad and Tobago: [www.gstt.org](http://www.gstt.org)***
- Energy Information Administration:  
[http://tonto.eia.doe.gov/country/country\\_energy\\_data.cfm?fips=TD](http://tonto.eia.doe.gov/country/country_energy_data.cfm?fips=TD)

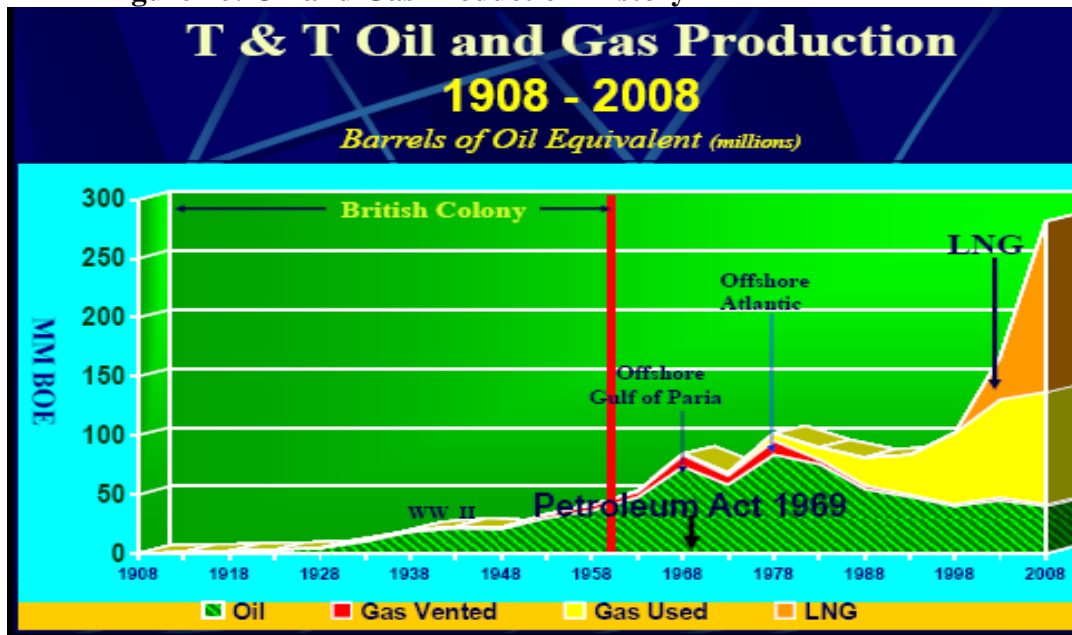
### 3.3 What outputs and by whom?

To what uses are we putting these resources, and who are the companies involved in production of various outputs? The output of the industry may be classified into primary and secondary outputs. **Primary production** includes crude oil, natural gas, condensate, and natural asphalt. **Secondary production** from crude oil comprises mainly petroleum products produced by the refinery—gasoline, kerosene, diesel, naphtha, aviation fuel and LPG or cooking gas.

**Secondary production** from natural gas fall into five main groups: a) LNG or liquefied natural gas; b) petrochemicals; c) metals; d) power; e) light industrial and commercial fuel applications.

This section presents data and sources on production of primary and secondary output by the major producers. Figure 16 provides a historical look at the production of oil and gas in Trinidad and Tobago over the last 100 years, highlighting critical turning points. For a chronological history of the development of the industry, see: <http://www.gstt.org/history/chronology.htm>

Figure 16: Oil and Gas Production History



Source: Trevor Boopsingh – Various presentations.

### 3.3.1 Crude Oil Production

Crude oil production declined steadily, after peaking in 1978 following nearly 70 years of commercial production. The decline trend endured until 2002, following which production was boosted, from output from BHP Billiton's new discovery. Production reached a peak of around 150,000 barrels a day in 2006. The latest available data indicate that crude oil production for averaged 114 thousand barrels per day in 2008, the lowest level in fifty years. As at June 2009, the situation had deteriorated further with the half year production average down a further 5 per cent to 109 thousand b/d. Unofficial data indicate that for the first time since 1958, oil production dipped below 100 thousand b/d in July 2009. (Table 4).

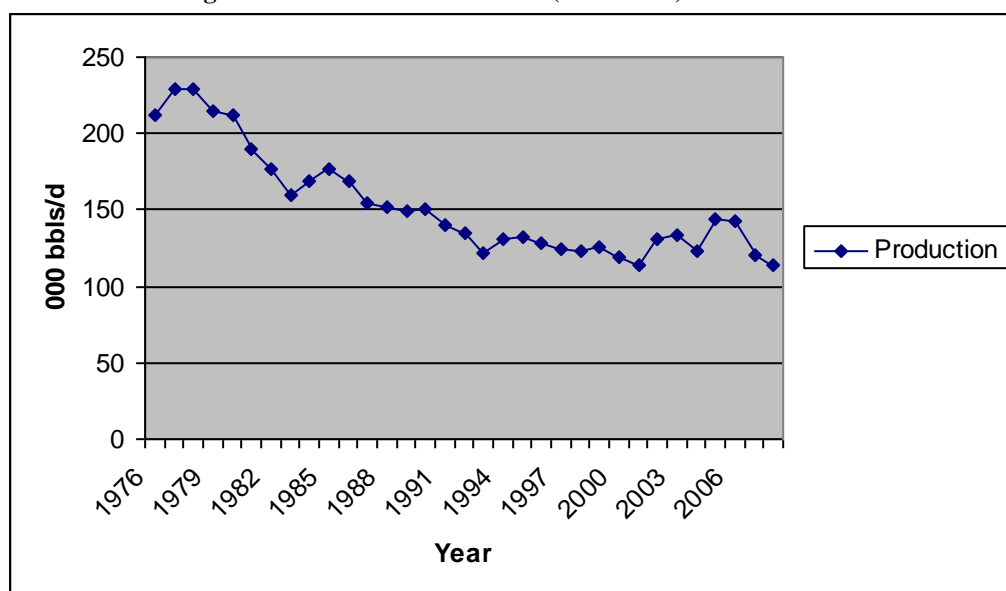
**Table 4: Crude Oil Producers 2008 (bbls/d)**

| Company      | Output        | % Share    |
|--------------|---------------|------------|
| Petrotrin    | 49,830        | 44         |
| BP           | 21783         | 19         |
| BHP          | 19962         | 17         |
| REPSOL       | 11625         | 10         |
| Others       | 10999         | 10         |
| <b>Total</b> | <b>114199</b> | <b>100</b> |

Source: GSTT

**SOURCE: GSTT**

**Figure 17 Crude Oil Production (1976-2008)**



**Source: Appendix Table A8**

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### 3.3.2 Petroleum Products

The Petrotrin refinery at Pointe-a-Pierre, which has capacity to refine some 160,000 barrels of oil daily, obtains its supplies from both local and foreign sources. The Pointe-a-Pierre refinery processes only about 60,000 barrels a day of local crude. Crude produced in the East Coast Marine Area is not considered appropriate quality for optimal processing at the refinery. Instead, producers export it to maximize value. Petrotrin imports crude on the international market.

In recent years, the refinery has been able to maintain a capacity utilization level in excess of 90 per cent (Table 5). The refinery product mix (Figure 18) indicates that low-value residual fuel oil still constitutes 34 per cent of the product mix. Investments are being made to upgrade the refinery so that it could reduce the share of low-value residual fuel oil in the overall product mix.

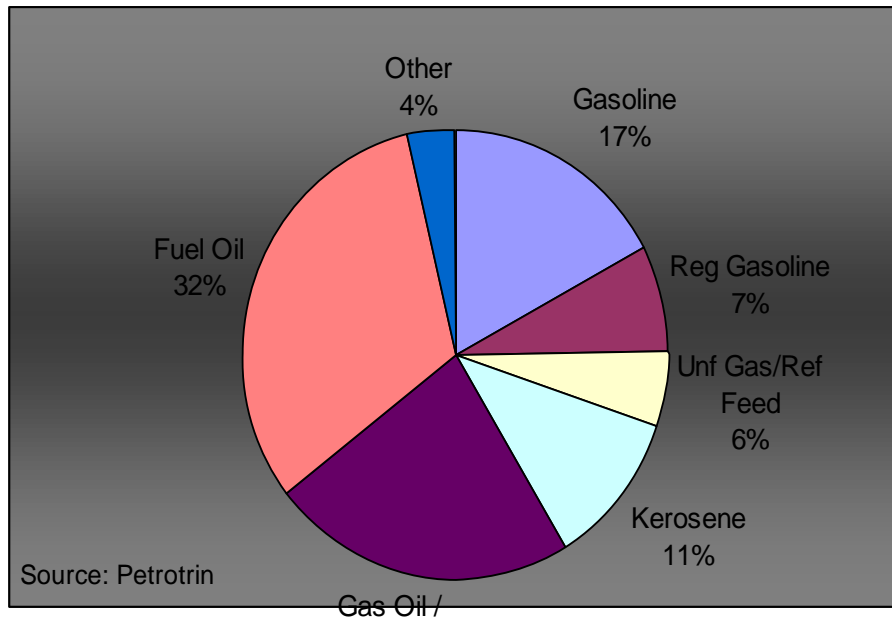
**Table 5: Refinery Throughput (000 bbl)**

| Year | Through/Put  | Imports      | Capacity Utilization% |
|------|--------------|--------------|-----------------------|
| 2002 | <b>54801</b> | <b>32241</b> | <b>82</b>             |
| 2003 | <b>54512</b> | <b>33186</b> | <b>85</b>             |
| 2004 | <b>47838</b> | <b>22772</b> | <b>79</b>             |
| 2005 | <b>60088</b> | <b>34200</b> | <b>94</b>             |
| 2006 | <b>55602</b> | <b>29728</b> | <b>92</b>             |
| 2007 | <b>56132</b> | <b>34315</b> | <b>93</b>             |
| 2008 | <b>55398</b> | <b>33415</b> | <b>92</b>             |

Source: Central Bank of Trinidad and Tobago, Annual Economic Survey,

2006-2008 : [www.central-bank.org.tt](http://www.central-bank.org.tt)

**Figure 18: Refinery Product Mix**

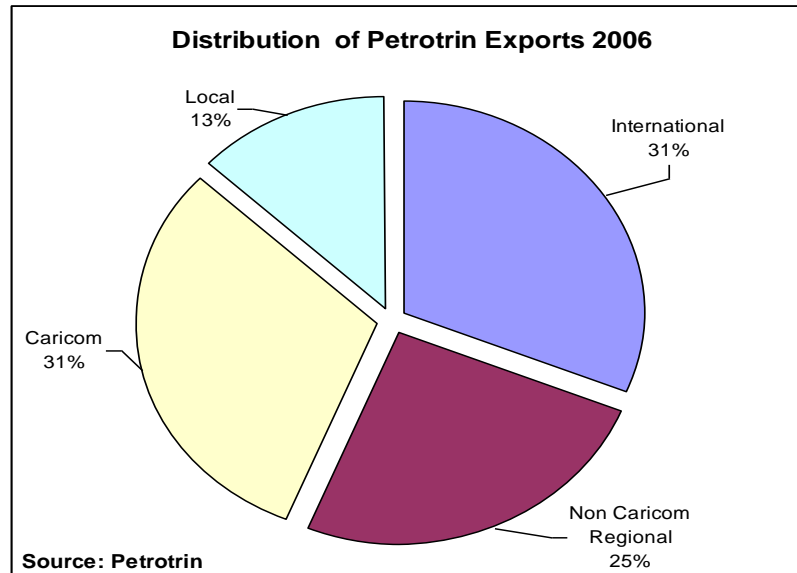


### 3.3.3 Petrotrin's regional and international markets

Although it is a small player in the international market, Petrotrin exports its products, which include propane gas, aviation fuel, motor gasoline, kerosene, gas oil, fuel oil, and bitumen, throughout the world (Figure 19).

The local market accounts for 20,000 barrels a day of refined products from Petrotrin. Up to 2006, the Caricom market and the French-speaking islands purchased an average of 50,000 barrels of oil per day. A similar amount was sold to the USA, while buyers in the Northern Caribbean and in some Central and South American States imported an average of 40,000 barrels a day. With the advent of Venezuela's Petrocaribe, Petrotrin has been forced to seek alternative markets for its refined products. A buoyant international market has facilitated Petrotrin in meeting what would have otherwise been a daunting challenge.

**Figure 19: Petrotrin Exports**

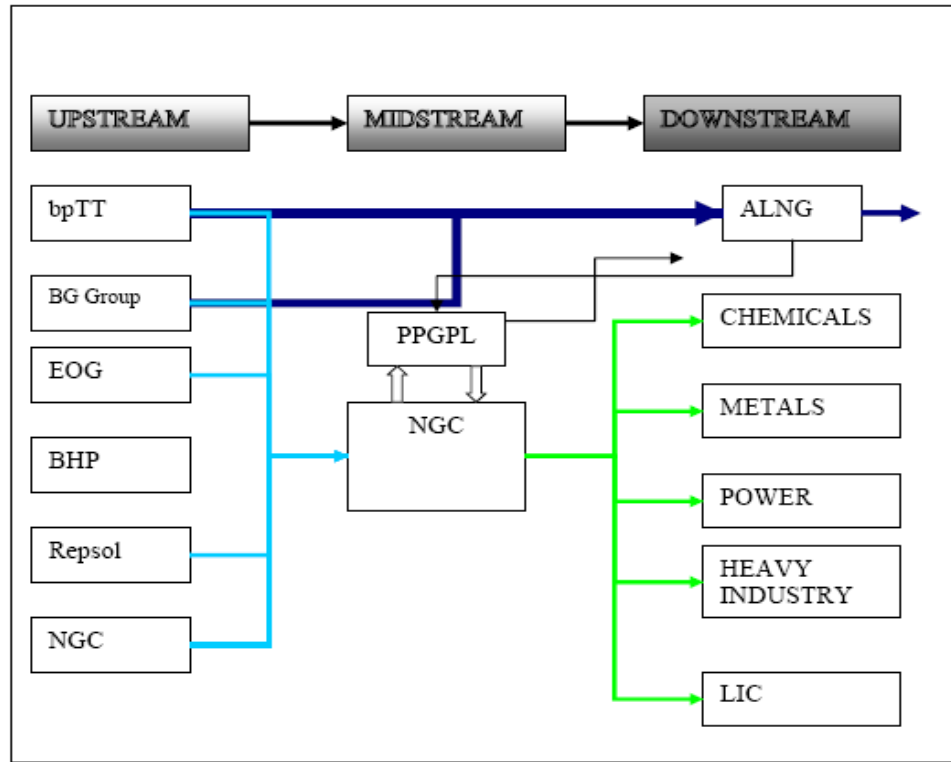


### 3.3.4 Natural Gas Markets

The natural gas market in Trinidad and Tobago is unlike that of the USA or Europe. In these advanced markets, competitive structures exist, along with a strong regulator. The Trinidad and Tobago market is an evolving one with several different structures characterizing the domestic gas segment, as distinct from the LNG segment. In the domestic market, the National Gas Company ([www.ngc.co.tt](http://www.ngc.co.tt)) plays multiple roles as the merchant aggregator, pipeline, and retailer. Producers sell gas to the NGC under contracts of 10 to 20 years. NGC then sells to firms in the domestic market on varying terms. Price and other contract arrangements are negotiated at an arm's-length basis with all firms, except for power generation and the light industrial and commercial sector, where there are predetermined rates.

However, the local market is evolving, and several contracts have recently been entered into directly between the consumer and the gas producer. In all such cases, the upstream gas supplier has had an equity stake in the downstream plant. With respect to the LNG business, NGC provides pipeline transportation services. Gas is sold directly to the plant or to processors. In 2007, gas sales to LNG constituted about 54 per cent of total gas utilization. Figure 20 provides a conceptual map of gas flows in the Trinidad and Tobago gas market.

**Figure 20: Conceptual map of T&T Gas Flow**



Source: A Brief Note on the Issue of Competition in the Natural Gas Market in Trinidad and Tobago, Gregory McGuire, Mimeo

### 3.3.5 Natural Gas Production

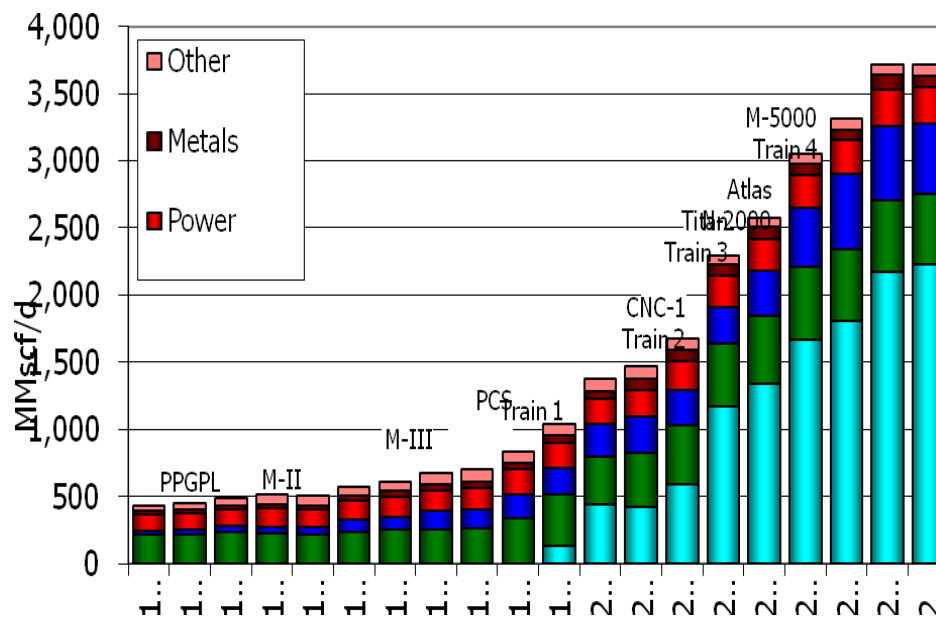
Between 1987 and 2008, T&T natural gas production has increased significantly. This is due in part to the establishment of four LNG plants between 1999 and 2006. Table 6 lists the major natural gas producers in Trinidad and Tobago in 2008. It shows the dominant role played by foreign enterprises in the key natural gas sector, accounting for over 95 per cent of total production. BPTT delivers the lion's share of output (62 per cent) while national firms contribute less than 7 per cent. The historical trend in gas utilization over the period 1995 to 2008 is shown in Figure 21.

**Table 6: Natural Gas Producers (2008)**

| COMPANY                                       | OUTPUT (MMscfd) | % Share |
|---|-----------------|---------|
| BPTT  | 2521            | 62%     |
| BGTT  | 895             | 22%     |
| EOG Resources                                 | 365             | 9%      |
| Others (Petrotrin, NGC, Trinmar, BHP, Repsol) | 269             | 7%      |

Source: Ministry of Energy and Energy Industries, Consolidated Monthly Bulletins 2008

**Figure 21: Natural Gas Utilization 1995-2008**

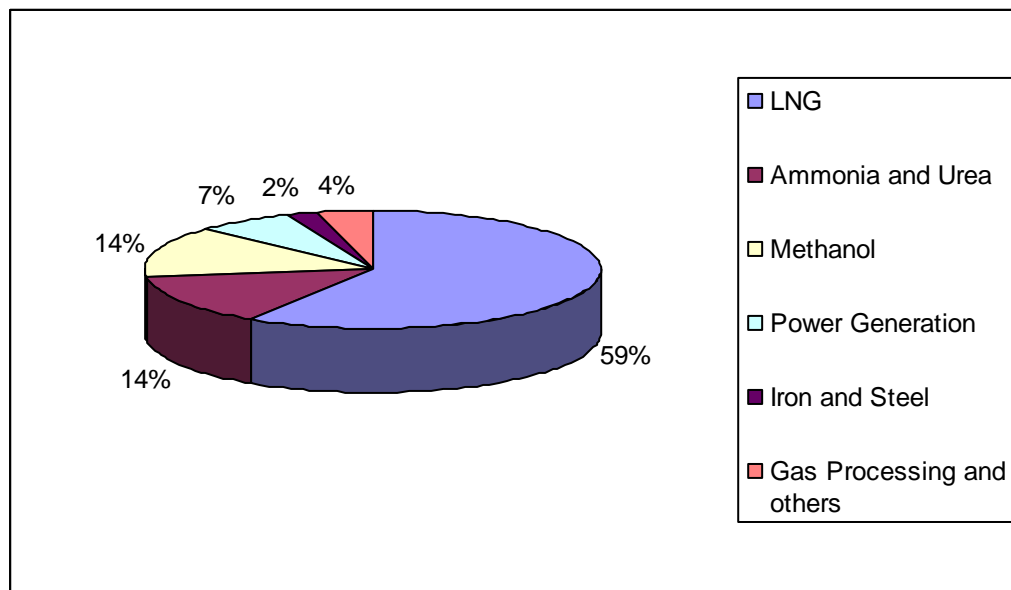


Source: National Gas Company of Trinidad and Tobago Limited

### 3.3.6 Gas Utilization

LNG has emerged as the dominant use, but the Trinidad and Tobago market provides for diverse applications of natural gas. Among gas-producing and gas-exporting countries, this country has one of the most diverse industries. Apart from LNG (59 per cent), the principal uses of natural gas in T&T include power generation (7 per cent); methanol (14 per cent); ammonia (14 per cent); iron and steel, (2 per cent); and other heavy, light, industrial and commercial applications (4 per cent) (Figure 22). The number of natural gas consumers now exceeds 140, the vast majority (122) of them being light industrial and commercial customers.

Figure 22 Natural Gas Utilization 2008



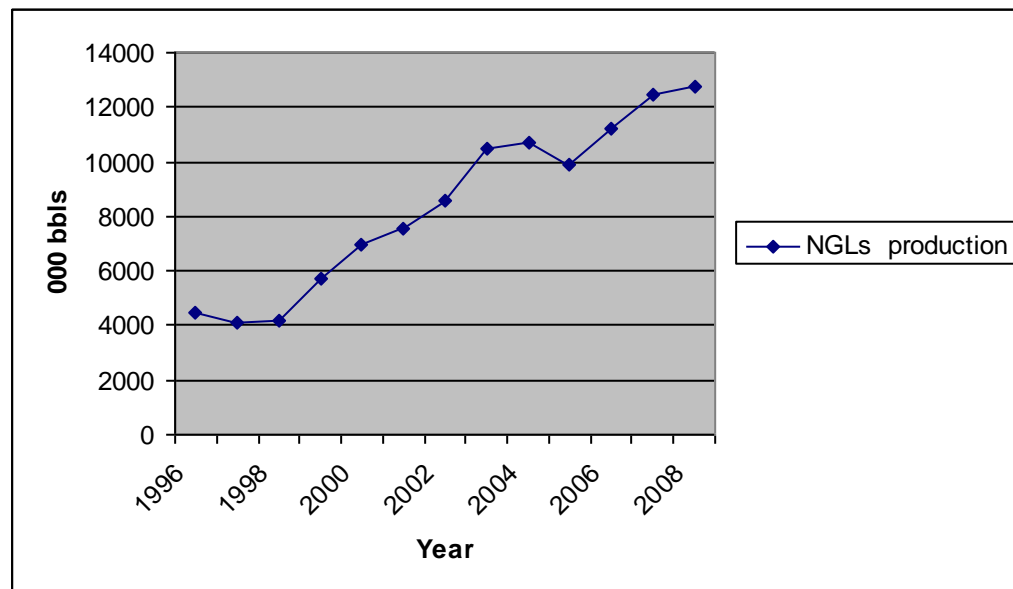
Source: Ministry of Energy and Energy Industries, Consolidated Monthly Bulletins 2008

### 3.3.7 Natural Gas Liquids

The familiar household cylinders of “cooking gas,” also known as LPG, contain a combination of propane and butane. These are two forms of natural gas liquids (NGLs), or heavy hydrocarbons, which are extracted from natural gas. Others include natural gasoline, ethane and pentane. This process is known as liquids extraction and is conducted at Phoenix Park Gas Processors Limited (PPGPL), which was established in 1991. PPGPL is a joint venture owned by NGC (51 per cent), Conoco (39 per cent), and Pan West (10 per cent).

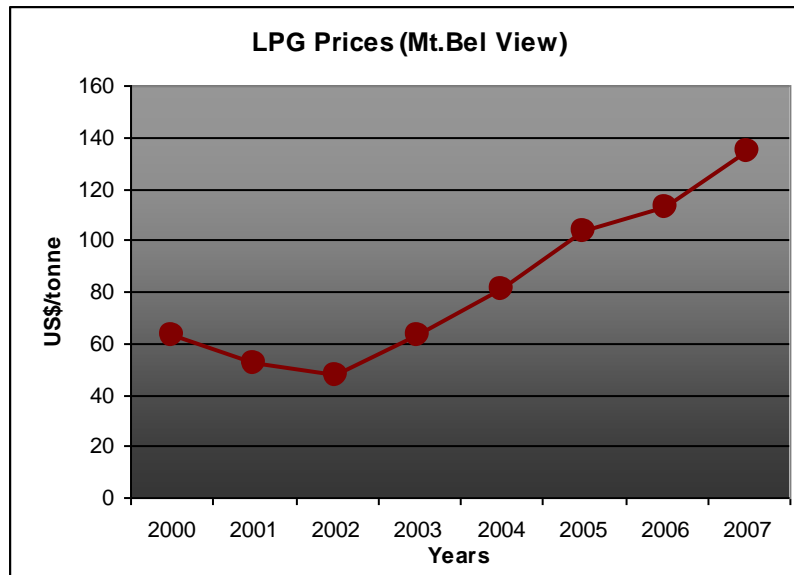
These components are removed from the natural gas to leave near- pure methane for use as the main feedstock in the manufacture of petrochemicals such as methanol, ammonia and urea. Figure 23 tracks the growth in natural gas liquids (NGL) production over the life of the Phoenix Park plant. The steep increase experienced reflects the increase in volumes of liquids becoming available from the Atlantic LNG operations.

**Figure 23: Natural Gas Liquids Production (1996-2008)**



**Source:** Appendix Table A12

**Figure 24: LPG Prices (2000-07)**

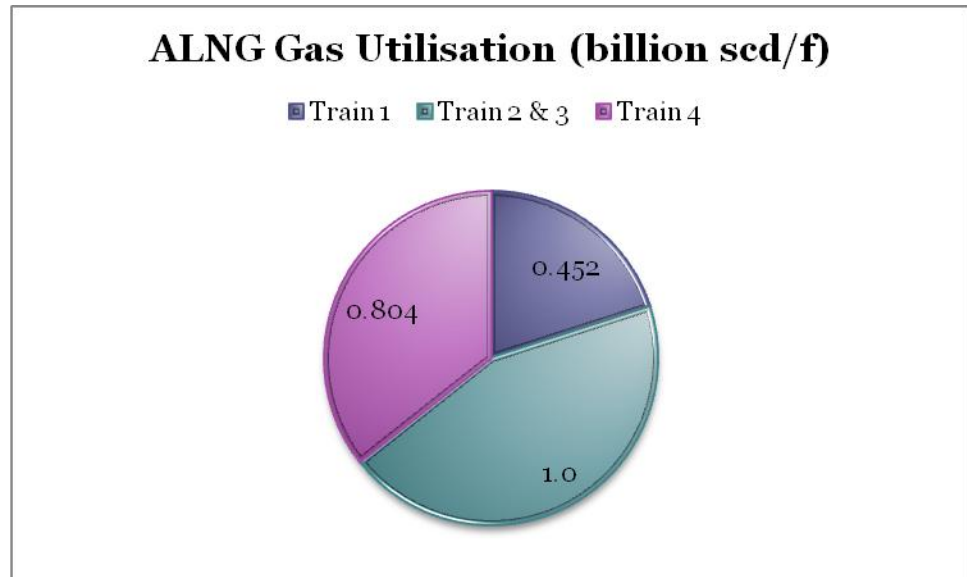


SOURCE: Pheonix Park Gas Processors Limited

### 3.3.7.1 Liquefied Natural Gas

T&T has been involved in oil production for 100 years, but has only recently emerged as a major player in natural gas, particularly with liquefied natural gas (LNG). Atlantic LNG (ALNG), which owns and operates the LNG plants in Point Fortin, has risen to become the single largest exporter of LNG to the USA. Atlantic's annual collective production capacity reaches 16.1 million tonnes of LNG. The pie chart below (Figure 26) provides information on the amount of natural gas utilized by all four LNG plants in T&T, based on their nominal capacity. LNG currently consumes around 55 per cent of natural gas produced in Trinidad and Tobago. The Atlantic LNG website provides useful information on the liquefaction process (LNG Facts and Fun). [www.atlanticlng.com](http://www.atlanticlng.com).

Figure 25: LNG Gas Utilization



**SOURCE: Table 7**

### 3.3.7.2 Ownership Structure

The name Atlantic LNG represents all the LNG liquefaction facilities at Point Fortin, but it should be noted that there are four plants (called Trains) and three different ownership structures and gas-supply arrangements. The principal companies involved in the LNG business at Point Fortin are Bp ([www.bp.com](http://www.bp.com)); Repsol/YPF ([www.repsolypf.com](http://www.repsolypf.com)); BG ([www.bggroupp.com](http://www.bggroupp.com)); Suez LNG districts ([www.distrigas.com](http://www.distrigas.com)); and National Gas Company of T&T ([www.ngc.co.tt](http://www.ngc.co.tt)).

Table 7 displays the ownership structure and the gas supply arrangements associated with each plant.

**Table 7: Atlantic LNG Arrangements**

| Plant & Capacity                     | Ownership  | Gas Supply   | Marketing   |
|--------------------------------------|--|--|---|
| Train 1<br>( 450 MMscfd)             | Bp- 34%<br>BG-26%<br>Repsol/YPF - 20%<br>Suez LNG- 10%<br>NGC- 10% | 100%<br>Bp   | Enagas 40% ( Spain)<br>Suez 60% ( Boston)         |
| Train 2 and 3<br>450mmscfd.<br>Each) | Bp 42.5%<br>BG-32.5%<br>Repsol YPF- 25%                            | 62.5%<br>Bp<br>37.5% BG                                | Bptt-62.5% Spain<br>Bg-37.5% USA                  |
| Train 4<br>800 MMscfd                | Bp 37.78<br>BG-28.89<br>Repsol-22.22<br>NGC-11.11                  | Bp<br>37.78<br>BG-28.89<br>Repsol- 22.22<br>NGC- 11.11 | Bp 37.78<br>BG-28.89<br>Repsol-22.22<br>NGC-11.11 |

SOURCE: MEEI; ALNG

### 3.3.7.3 LNG markets

In 2006, Atlantic LNG accounted for seven per cent of the world's LNG production. The major markets for Atlantic LNG exports are the US, Spain, Puerto Rico and the Dominican Republic. Atlantic LNG actually commands about 72 per cent of the American market and 1 per cent of the European market.

### 3.3.7.4 LNG Revenues

Between 1999 and 2006, the estimated value of LNG sales was US\$16 billion (Table 8). Total taxes paid to the T&T government from Trains II, III and IV are estimated as US\$396 million. This is equivalent to a tax take of roughly 2.5 cents /dollar of gross sales revenue. However, these are only rough estimates, and this underscores the need for greater transparency concerning company payments to the government.

**Table 8: Atlantic LNG Total Sales and Revenues 1999-2006**

| Year         | US sales<br>(Million<br>mmbtu) | US Revenue<br>(US\$M) | Non US<br>sales<br>(Million<br>mmbtu) | Non US<br>revenue<br>(US\$M) | Total<br>sales<br>(Million<br>mmbtu) | Total<br>Revenue<br>(US\$M) |
|--------------|--------------------------------|-----------------------|---------------------------------------|------------------------------|--------------------------------------|-----------------------------|
| 1999         | 52.3                           | 128.57                | 25.5                                  | 74.4                         | 77.8                                 | 202.97                      |
| 2000         | 101.9                          | 360.05                | 54.0                                  | 206.4                        | 155.9                                | 566.45                      |
| 2001         | 100.9                          | 430.17                | 40.2                                  | 162.1                        | 141.2                                | 592.27                      |
| 2002         | 155.6                          | 544.69                | 49.8                                  | 192.9                        | 205.4                                | 737.59                      |
| 2003         | 389.4                          | 1,903.23              | 62.6                                  | 322.0                        | 452.0                                | 2,225.23                    |
| 2004         | 476.0                          | 2,860.78              | 44.4                                  | 280.3                        | 520.4                                | 3,141.08                    |
| 2005         | 452.4                          | 3,579.51              | 67.5                                  | 620.5                        | 519.9                                | 4,200.01                    |
| 2006         | 400.9                          | 3,022.23              | 178.3                                 | 1402.6                       | 579.2                                | 4,424.83                    |
| 2007         | 723.9                          |                       |                                       |                              |                                      |                             |
| 2008         | 737.6                          |                       |                                       |                              |                                      |                             |
| <b>Total</b> | <b>3,590.9</b>                 | <b>12,829.24</b>      | <b>522.28</b>                         | <b>3,261.17</b>              | <b>2651.8</b>                        | <b>16,090.42</b>            |

Source: Ministry of Energy and Energy Industries—Petroleum and Petrochemical Industry Monthly Bulletins (April 1999-December 2008)

### 3.3.8 Sources of information:

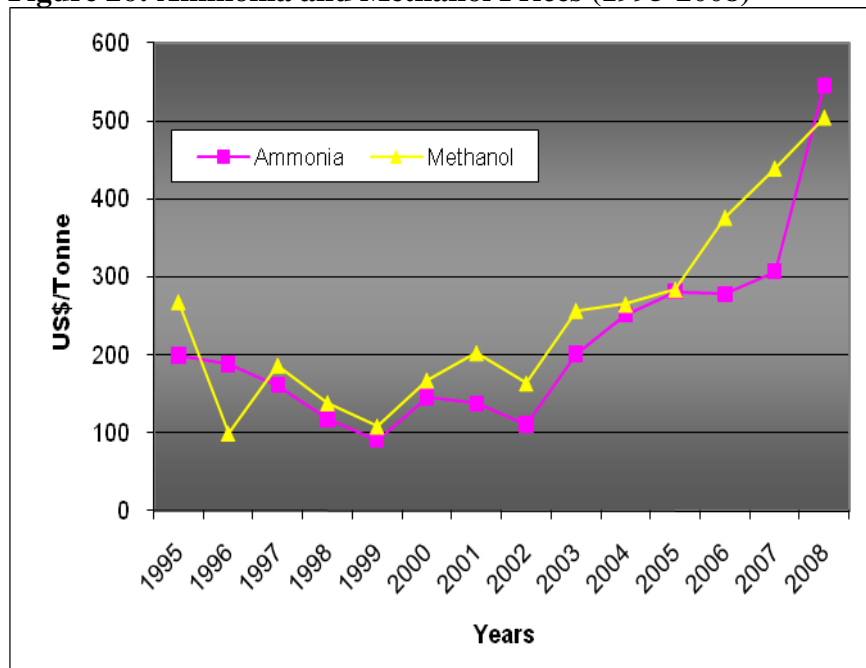
Important sources of information for this section include:

- Central Bank of Trinidad and Tobago Annual Economic Survey and Economic Bulletin. [www.centralbank.org.tt](http://www.centralbank.org.tt)
- Ministry of Energy and Energy Industries: Annual Reports and Monthly Statistical Bulletin
- The Energy Journal  
[http://tonto.eia.doe.gov/country/country\\_energy\\_data.cfm?fips=TD](http://tonto.eia.doe.gov/country/country_energy_data.cfm?fips=TD)
- Oil and Gas Journal <http://studio-5financialcontent.com>
- Penn Energy Oil and Gas Research International Data
- American Association of Petroleum Geologists
- Geological Society of Trinidad and Tobago [www.gstt.org](http://www.gstt.org)
- [www.bp.com](http://www.bp.com)
- <http://www.bg-group.com/OurBusiness/WhereWeOperate/Pages/TrinidadandTobago.aspx>
- [www.atlanticlng.com](http://www.atlanticlng.com)
- World Gas Intelligence  
[http://www.energyintel.com/PublicationDetail.asp?publication\\_id=10](http://www.energyintel.com/PublicationDetail.asp?publication_id=10)
- **Natural gas.org** [www.naturalgas.org](http://www.naturalgas.org) Section 1
- Centre for Liquefied Natural Gas [www.lngfacts.org](http://www.lngfacts.org)
- Federal Energy Regulatory Commission <http://www.ferc.gov/industries/lng>

### 3.3.9 Petrochemical Industries

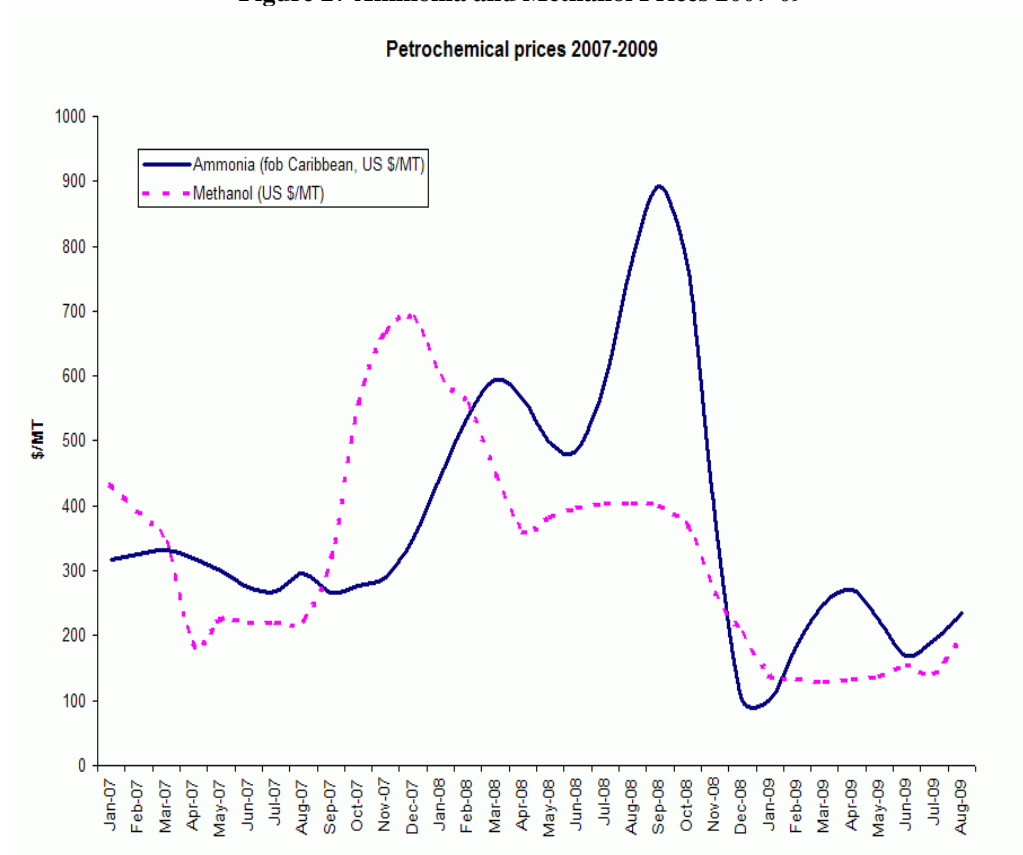
Trinidad and Tobago has a vibrant natural gas-based petrochemical sector now in its 50th year. In this section, focusing on prices, production and exports, we profile these downstream oil and gas-based industries. Appendix - Table 12 provides an overview of the production trends of various downstream industries. Appendix - Table 13 and Figures 26 and 27 offer a vivid picture of price movements for major downstream products since 1995. Notice the simultaneous price increases across all commodities from 2001 to mid 2008 followed by the precipitous collapse in the wake of the global financial and economic crisis Figure 27 shows pricing trends over the period 2007-09. Details on the various sub-sectors appear later in this section.

**Figure 26: Ammonia and Methanol Prices (1995-2008)**



SOURCE: APPENDIX TABLE A13

Figure 27 Ammonia and Methanol Prices 2007-09



Source: Green Markets; CIMA Methanol Monthly

### 3.3.9.1 Ammonia Industry

Trinidad and Tobago has been in the fertilizer business since the opening in 1959 of the Federation Chemicals plant (now Yara) ([www.yara.com](http://www.yara.com)). New investment in the fertilizer industry did not come until nearly 20 years later with the start-up of Trinidad Nitrogen in 1978. Two new plants were built in the 1980s- Fertrin in 1983 and Tringen II in 1988. In the 1990s, the next major expansion entailed an upsurge of both foreign and domestic private capital in the industry. The former Fertrin plants changed hands twice and are now owned by PCS Nitrogen, with double the original capacity ([www.potashcorp.com](http://www.potashcorp.com)). Point Lisas Nitrogen Limited had been established by a joint venture of two US companies- Farmland Industries and Mississippi Chemicals in 1998. Both filed for bankruptcy in 2003 and the company is now owned by Terra Industries Limited ([www.terrannitrogen.com](http://www.terrannitrogen.com)) and Koch Mineral Services ([www.kochind.com](http://www.kochind.com)). Local conglomerate CL Financial also entered the fertilizer business in 2002 with the Caribbean Nitrogen plant (2002) and in

2004 added N2000 ([www.clfinalcial.com](http://www.clfinalcial.com)). The plants are owned by a consortium of companies, including EOG Resources and Koch Industries.

Trinidad and Tobago is presently a major global fertilizer-producing centre. Ten fertilizer plants operate here, of which nine produce ammonia and one, urea. This country is also the world's leading exporter of ammonia. Figure 28 illustrates T&T total production and exports for both urea and nitrogen from 1984 to 2008.

**Figure 28: T&T Fertilizer Production and Exports (1984-2008)**



**Source:** Central Bank of Trinidad and Tobago, Annual Economic Survey (various issues)

Appendix - Table A14 gives a breakdown of the ammonia producers in Trinidad and Tobago, their capacity and ownership.

### 3.3.9.2 Methanol Industry

Trinidad and Tobago's six methanol producing plants are owned by two groups of companies. Tables 9 and 10 detail the ownership structure of these firms. CL Financial, through its holding company, Methanol Holdings Trinidad Limited (MHTL) ([www.ttmethanol.com](http://www.ttmethanol.com)), holds 11.25 per cent of four firms, and majority ownership (64.3 per cent) of the largest company (Table 9).

**Table 9: MHTL Methanol Plants**

| Plant Name   | Capital Cost<br>(\$M (US)) | Plant Capacity<br>(000Tonnes/yr) | Efficiency<br>(Msc/ Tonne ) | CL<br>Financial% | Consolidated<br>Energy Limited<br>(Ferrosstaal and<br>Helm)% |
|--|----------------------------|----------------------------------|-----------------------------|------------------|--|
| Trinidad and<br>Tobago Methanol<br>Company I             | 172.9                      | 500                              | 29.1                        | 11.25            | 88.75  |
| Caribbean<br>Methanol Company<br>limited                 |                            | 500                              | 35.3                        | 64.9             | 35.1   |
| Trinidad and<br>Tobago Methanol<br>Company Limited<br>II |                            | 550                              | 32.2                        | 11.25            | 88.75  |
| MIV Methanol<br>Plant                                    |                            | 550                              | 37.9                        | 70               | 30   |
| M5000 Mega<br>Methanol Plant                             |                            | 1900                             | 28.2                        | 64.3             | 35.8   |

Source: Methanol Holdings Trinidad Limited

MHTL has the capacity to produce approximately 4.1 million metric tonnes of methanol a year, making it the second largest producer of methanol in the world, commanding almost 10 per cent of world methanol production. A breakdown of MHTL exports show that 65 per cent of its exports go to the US, and 34 per cent to Europe. The local market accounts for one per cent of all sales of methanol. The net foreign exchange derived from the MHTL plants in 2006 was estimated as US\$141 million.

**Methanex Company** of Canada (<http://www.methanex.com>) also operates two large methanol plants in T&T. Methanex is the largest producer of methanol in the world. In 2006, its revenue from all its international operations was approximately US\$2.1 billion. Methanex's 2006 annual report notes that its Latin American operations, defined to include two plants in T&T and four in Chile, contribute significantly to its global dominance in the methanol market. Closeness to the export markets and easy access to cheap natural gas have been even more important

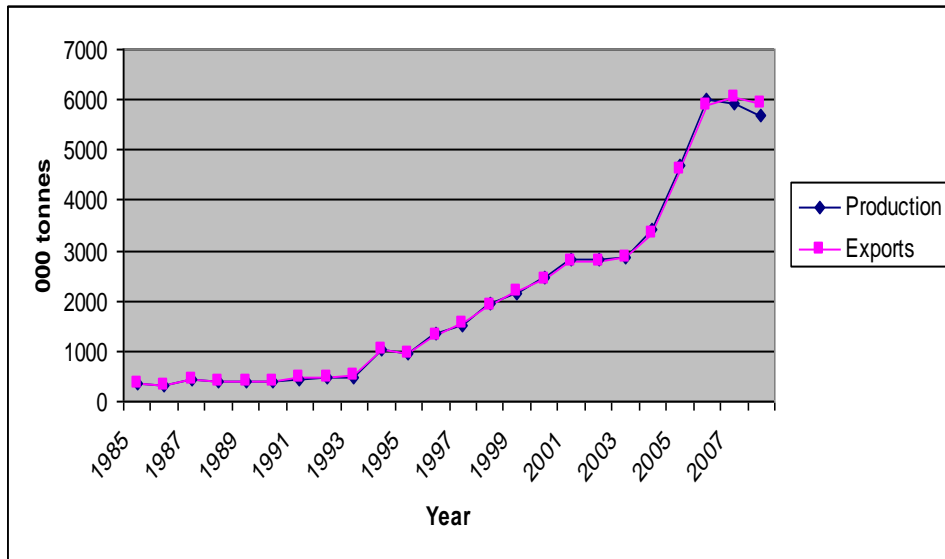
factors in setting up operations in T&T. Table 10 below gives a breakdown of Methanex's operations in T&T.

**Table 10: Methanex Methanol Plants in T&T**

| Name  | Start Year | Capital Cost<br>US\$ Mn. | Capacity<br>(Mmpta) | Plant Efficiency | Ownership  |
|---|------------|--------------------------|---------------------|------------------|--|
| Methanex Trinidad Ltd<br>(formerly, Titan Methanol) | 1999       | 261                      | 0.85                | 33.1             | Methanex Corporation<br>Canada 100%                    |
| Atlas   | 2003       | 300                      | 1.7                 | 26.9             | Methanex Corporation<br>Canada 63.1% and<br>BPTT 36.9% |

**Source:** Methanex

Figure 29: Methanol Production and Exports (1985-2008)



SOURCE: Central Bank of Trinidad and Tobago, Annual Economic Survey (various issues)

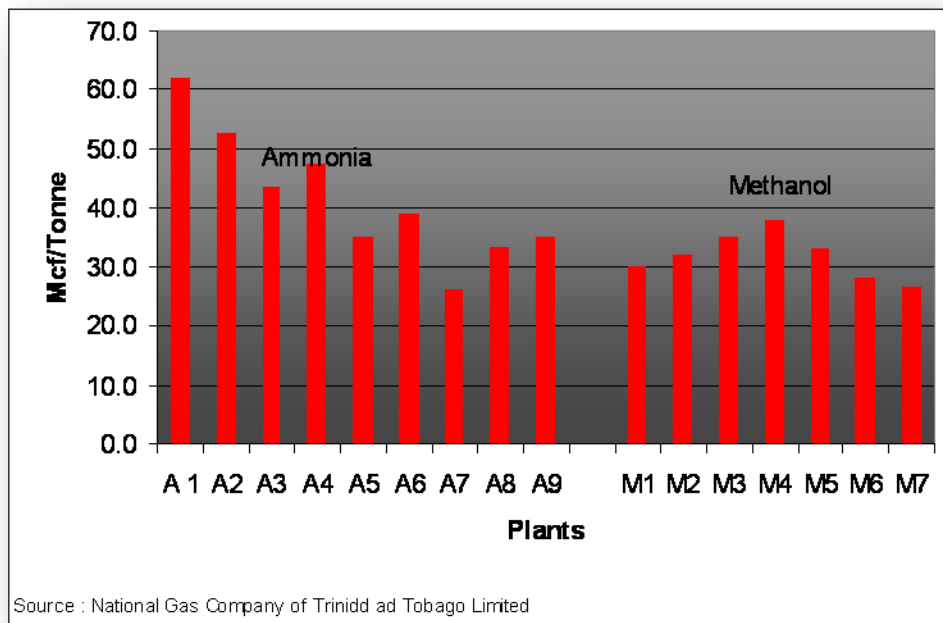
### 3.3.9.3 Plant Efficiencies

Changes in the efficiency of petrochemical plants have been instructive. The efficiency of a plant is measured as the amount of natural gas used (Mcf) to produce a tonne of output (MT), that is, (Mcf/MT).

Figure 30 shows the efficiency values of plants operating in 2007. A few general observations may be made. First, newer plants consume far less gas in producing a tonne of output than do older plants. Second, methanol is more efficient than ammonia in converting natural gas to product. Third, an important question arises: should plant efficiency be considered in deciding the terms of renewed gas supply contracts, and in the rationalization of natural gas usage over time?

A modern petrochemical plant (26-28Mcf/tonne) will make the same amount of ammonia or methanol, using half the quantity of natural gas required by the oldest petrochemical plant (62Mcf/Tonne). Should the latter be kept running on the same terms and conditions as the former?

**Figure 30: Petrochemical Plant Efficiencies**



### 3.3.9.4 Key Information Sources

The following are some key sources of information on the petrochemical business:

- Annual Economic Survey: Central Bank of Trinidad and Tobago. [www.central-bank.org.tt](http://www.central-bank.org.tt)
- Economic Bulletin: Central Bank of Trinidad and Tobago. [www.central-bank.org.tt](http://www.central-bank.org.tt)
- Energy Caribbean: bimonthly publication of Media and Editorial Projects Limited
- [www.meppublishers.com](http://www.meppublishers.com)
- Annual Report: Ministry of Energy and Energy Industries [www.energy.gov.tt](http://www.energy.gov.tt)
- Methanol Holdings Trinidad Limited- [www.ttmethanol.com](http://www.ttmethanol.com)
- Methanol Market Report- Chemical Market Associates Inc. <http://www.cmaiglobal.com/>
- Ammonia Outlook: Quarterly publication of [www.ferticon.com](http://www.ferticon.com)
- Fertecon Ammonia Report: Weekly publication of FERTECON Limited
- Green Markets; Fertilizer Markets Intelligence Weekly publication of Pike and Fisher. [www.greenmarkets.pf.com](http://www.greenmarkets.pf.com)

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- Methanex Monthly Average Regional Posted Prices: <http://www.methanex.com/products/methanolprice.html>
  - YARA [www.yara.com](http://www.yara.com)
  - Terra Industries Limited. [www.terranitrogen.com](http://www.terranitrogen.com)
  - Koch Mineral Services LLC. [www.kochind.com](http://www.kochind.com)

### **3.3.9.5 Metals Industries**

Relatively cheap energy, i.e. natural gas and electricity, provide Trinidad and Tobago with one component of a competitive advantage in the energy-intensive metals industries. Back in 1974, a National Consultation on the Best Uses of our Natural Resources identified steel and aluminum as targeted industries primarily because of their tremendous potential for value-added downstream expansion and for enhancing the industrial base. The steel industry has expanded and continues to grow. There have been renewed efforts since the mid-nineties to establish an aluminum smelter, after the failure of the first initiatives in the 1970s.

### **3.3.9.6 Iron and Steel Industry**

Two companies operate steel facilities, and a third is under construction. The iron and steel industry was established on the premise that, with an abundant supply of relatively cheap natural gas as energy, Trinidad and Tobago would be able to realize a competitive position in the global market. The first iron and steel firm, the government-owned Iron and Steel Company of Trinidad and Tobago (ISCOTT), commenced operations in 1980. In its early years, ISCOTT suffered heavy losses because of weak markets, trade barriers, and operating inefficiencies. By 1989, the government had divested ISCOTT to Ispat, then a growing Indian steel international. Today, assets of the former ISCOTT are owned by Acelor Mittal, the successor of Ispat, and the world's largest steel producer ([www.arcelormittal.com](http://www.arcelormittal.com)). The company's major products are direct reduced iron, billets and wire rods. Growth in production could be attributed to expansion of plant capacity and injection of new technology.

The second plant is owned by NU Iron Unlimited, a subsidiary of US firm Nucor ([www.nucor.com](http://www.nucor.com)). Nu-Iron's plant has the capacity to produce 1.8 million tonnes a year of direct reduced iron. Operations commenced in January 2007.

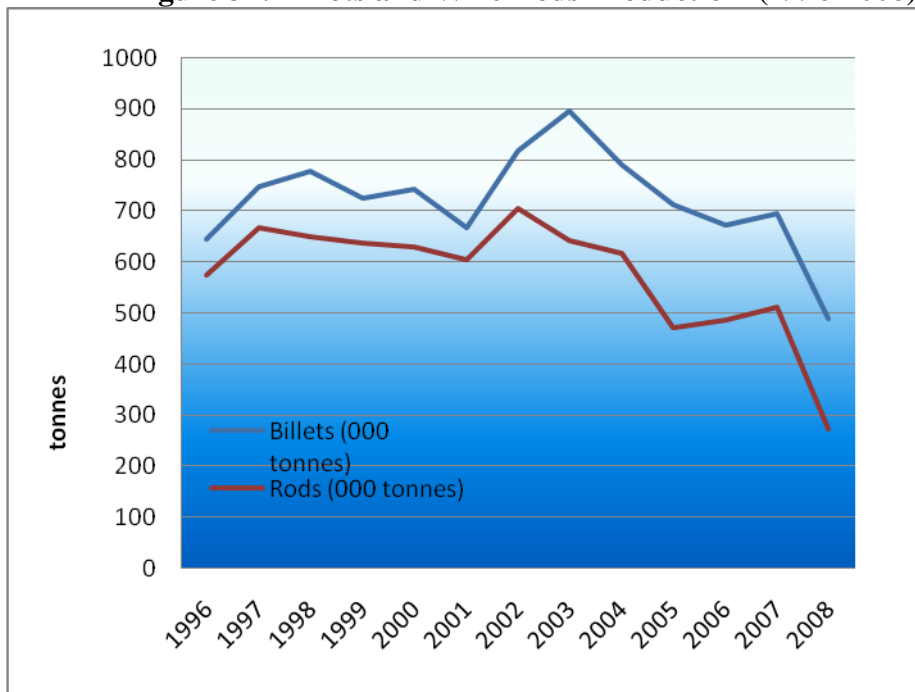
In addition, the ESSAR Group proposed the construction of a new steel mill, at a cost of US\$1.1 billion, with an expected capacity of four million tonnes a year ([www.essar.com](http://www.essar.com)). The plant has reportedly been delayed by financing challenges as a result of the global economic and financial crisis.

In addition, environmentalists and concerned citizens are stridently opposing the construction of this plant.

At Acelor Mittal, the steel production process is vertically integrated, with three intermediate products being produced. Iron ore is imported mainly from Brazil and converted first into direct reduced iron. The product may be exported in that primary state, or used for further elaboration into steel billets. Billets are further converted into wire rods, or may be exported as billets for downstream processing elsewhere. Data on steel production by product are published by the Central Bank's Economic bulletin or Annual Economic Survey ([www.central-bank.org.tt](http://www.central-bank.org.tt)).

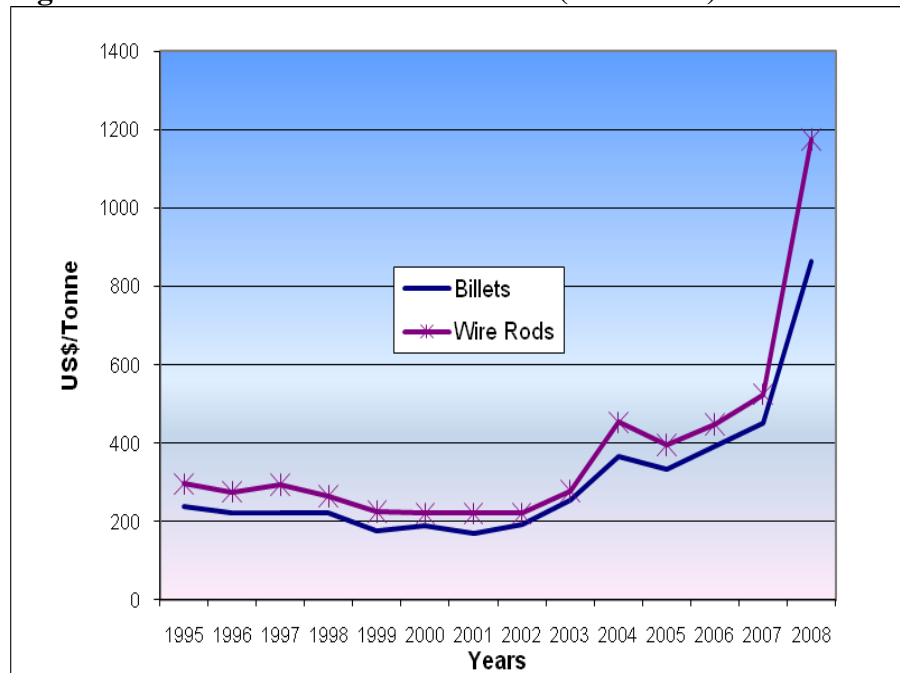
The data show that production of the intermediate products –billets and wire rods have been on a decline trend since 2003.(Figure 31) This may suggest that more DRI was been exported for elaboration in Mittal facilities elsewhere. It is interesting to note that this decline occurred during a period of rising prices : Figure 32. Like all other commodities, steel prices fell sharply in the aftermath of the global financial crisis. Billets prices seem to have stabilized at around US\$450/tonne for most of 2009, down from a peak of US\$ 1200/Tonne in 2008.

**Figure 31: Billets and Wire Rods Production (1996-2008)**



Source: Central Bank of Trinidad and Tobago Annual Economic Survey, various issues

**Figure 32: Billets and Wire Rods Prices (1995-2008)**



**Source: Table A13**

### **3.3.9.7 Aluminum Industry**

Since the mid-1990s, renewed interest in a Trinidad and Tobago aluminum industry has been shown by Southwire Corporation, Norsk Hydro, Noranda and lately, Alcoa. For one reason or other these initiatives did not materialize.

Altrint, however, now seems poised to become the country's first aluminum smelter. Government will hold majority ownership in the smelter and is reported to be in search of a partner since the pullout of Sural of Venezuela. Altrint's 125,000 tonnes-a-year facility is being constructed at the Union Industrial Estate in La Brea. The company promises downstream expansion into rods wire and cables, and aluminum-alloy car wheels. Similar promises from the initial years of the steel industry are still unrealized.

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## Key information sources

- Arcelor Mittal [www.arcelormittal.com](http://www.arcelormittal.com)
- Nucor [www.nucor.com](http://www.nucor.com).
- Essar Steel [www.essar.com](http://www.essar.com)
- Central Bank of Trinidad and Tobago [www.central-bank.org.tt](http://www.central-bank.org.tt)
- Metal Bulletin [www.metalbulletin.com](http://www.metalbulletin.com)

### 3.3.9.8 Power Generation - *Structure of the Electricity Sector*

The Power Generation sector comprises one transmission and distribution company—Trinidad and Tobago Electricity Commission—and two power generators—Powergen and Trinity Power. T&TEC is also responsible for procuring natural gas for the generation companies and has a contract with the National Gas Company (NGC) for the purchase of natural gas as fuel for electricity generation.

T&TEC purchases bulk electric power from the independent generation companies for resale to its domestic, commercial and industrial customers.

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. The original shareholders were T&TEC— 51 per cent, Mirant Corporation— 39 per cent and Amoco- 10 per cent. Since then, BP has replaced Amoco as a consequence of the purchase of the latter by BP. In August 2007, the Marubeni Corporation of Japan ([www.marubeni.com](http://www.marubeni.com)) acquired the assets of Mirant. Powergen's current total installed capacity is 1178 MW, of 100 per cent gas- fired generation. POWERGEN owns and operates three main power stations located at:

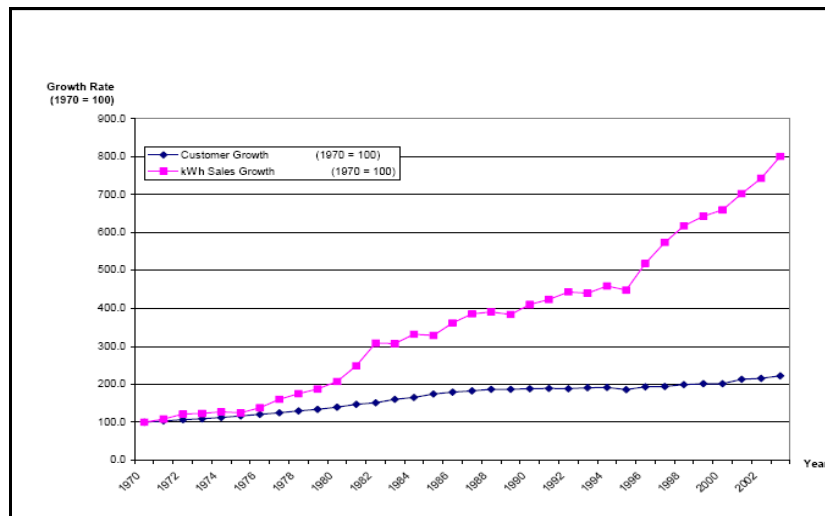
- Port of Spain (308 MW)
- Point Lisas (634 MW)
- Penal (236 MW).

The company sells bulk power to T&TEC under a 15-year power purchase agreement. The agreement specifies the mechanism for determining the price to be paid by T&TEC for bulk power, based on capacity and demand charges. In response to changes in fuel costs and inflation, prices are periodically adjusted.

Trinity Power Limited commenced operations in September 1999 as InnCogen Limited. Trinity 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 agreement to supply 195 MW. The agreement features terms similar to those of the POWERGEN agreement.

Figure 33: T&TEC Growth in Sales of Electricity and Customers (1970-2003)



**Source:** Trinidad and Tobago Electricity Commission

**Key Information Sources:**

- Regulated Industries Commission ([www.ric.org.tt](http://www.ric.org.tt))
- Marubeni Corporation ( [www.marubeni.com](http://www.marubeni.com))
- Trinidad and Tobago Electricity Commission ([www.ttec.co.tt](http://www.ttec.co.tt))

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### 3.4 Local Content and Value Added

How much (in value terms) of the goods and services required by energy-related firms is sourced locally, and how much is sourced abroad? In the absence of a detailed study of the necessary data, this question cannot be meaningfully addressed. The government has conceded the need to increase the value derived from the industry through local sourcing of products and services, and has developed and articulated a relevant policy framework.

Local content policy in Trinidad and Tobago is set out in the *Local Content & Local Participation Policy Framework*, published in 2004. While not a statutory or legislative document, the framework document defines local content, national ambitions and expectations of participants in the oil and gas sector.

#### 3.4.1 Stated Intention

The stated intention of the policy is to:

*“maximize the participation of its national people, enterprises, technology and capital through the development of locally owned businesses, local financing and human capabilities in the conduct of all activities connected with the energy sector, along its entire value chain, within and outside T&T.”*

#### 3.4.2 Definitions

Local content and participation are defined to include:

- ownership,
- control,
- decision-making, and
- preferential access to financing.

The framework document emphasizes the development of industries which will have lasting benefits for the non-energy sector.

The government appears to recognize that, for the policy to be a success, it must play its part in the creation of capacity. To that end, it has established, often in collaboration with foreign (US and Canadian) educational establishments, a number of educational and vocational initiatives with the aim of averting a long-term shortfall in skills. Among other things, the government has increased funding for the geosciences programme at the University of the West Indies, and has established the National Energy Skills Centre/T&T Institute of Technology, which later formed the basis for the establishment of the University of Trinidad and Tobago (UTT).

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The local content and local participation policy document is available from the Ministry of Energy's Website:  
[http://www.energy.gov.tt/applicationloader.asp?app=doc\\_lib\\_details&id=194](http://www.energy.gov.tt/applicationloader.asp?app=doc_lib_details&id=194)

### **3.5 Are we receiving the highest feasible level of national return?**

For citizens in resource-based economies, this question has probably been the most perplexing. Citizens acknowledge that resources do bring benefits to the economy. Still, lingering suspicion concerning the motives and activities of multinationals breeds doubt regarding the sharing of returns between the State and the corporations. Citizens therefore want to know if the country is receiving the highest value possible in terms of:

- Maximizing domestic value added, and
- Maximizing foreign-exchange earnings and national revenue.

This question cannot be answered in this report. Detailed studies remain to be done, for which the relevant information must be provided. The Vision 2020 Energy Subcommittee Report recognizes the importance of this issue, and captures it in two of its priority goals:

- To extract maximum values from the hydrocarbon resource in a manner that delivers to T&T the capacity to sustain itself beyond the life of the local energy sector.
- To increase the share of benefits accruing to T&T from the value chain through the strengthening of the linkages between the energy sector and the rest of the economy.

The Vision 2020 document outlines specific objectives and initiatives targeted towards the accomplishment of these goals. The Vision 2020 Energy Report is available at: [http://www.vision2020.info.tt/cms/index.php?option=com\\_content&task=view&id=71&Itemid=80](http://www.vision2020.info.tt/cms/index.php?option=com_content&task=view&id=71&Itemid=80)

### **3.6 Are we investing captured economic rents?**

Are we investing economic rents to provide for a long-term future without oil and gas, and to stave off short-run impacts of price fluctuations?

During the 1973-1981 oil boom, the Government accumulated foreign exchange reserves to the extent of US\$3.2 billion. These were, however, dissipated between 1982 and 1987 when oil prices fell dramatically, diminishing foreign exchange earnings and government revenue. Despite those events, the status quo was maintained in both the exchange rate (other than an adjustment in the early 1980's<sup>10</sup>), and in government expenditure.

In 2000, in the context of fresh buoyancy in oil prices—and higher natural gas production—the Government initiated a Revenue Stabilization Fund. In 2007, Parliament formally enacted the Heritage and Stabilisation Fund. Table 11 below shows the contributions to this Fund up to September 2008. The Central Bank has been assigned the responsibility of managing the Fund. More details are provided in the accompanying technical report on the Heritage and Stabilisation Fund.

**Table 11: Trinidad and Tobago Heritage and Stabilization Fund**

| Year                | US \$million | TT\$ Million |
|---------------------|--------------|--------------|
| September 1999/2000 | 65.87        | 415          |
| September 2001      | 161.11       | 1015         |
| September 2002      | 162.66       | 1015         |
| September 2003      | 249.12       | 1566.9       |
| September 2004      | 449.23       | 2830.2       |
| September 2005      | 640.33       | 4034.1       |
| September 2006      | 1354.13      | 8544.6       |
| September 2007      | 1,680.00     | 10,617.60    |
| September 2008      | 2888.41      | 18196.98     |

SOURCE: Ministry of Finance: HSF Annual Report (various issues)

<sup>10</sup> When the exchange rate was changed from TT\$2.40=US\$1 to TT\$3.60=US\$1

### 3.7 Legislative and Governance Framework

#### *The Legal Framework of the Energy Sector*

This section provides a listing of relevant legislation comprising the legal framework for the energy sector. It covers all Acts amended after Independence in 1962. Amendments prior to 1962 which are not shown here may be recognized from the words “Since 1962...” It should also be noted that the Minister does not have the right to override any of these Acts.

|  | <b>Original Legislation</b>  | <b>Amendments</b>   | <b>Purpose</b>   |
|--|--|---|--|
| Fiscal regime and Acts related to fiscal policy (See Appendix 1 for System of Taxation in Trinidad and Tobago) | The Petroleum Act Chapter 62:01 and Regulations; ( <a href="http://rgd.legalaffairs.gov.tt/Laws/Chs.%2061-62/62.01/62.01%20aos.htm">http://rgd.legalaffairs.gov.tt/Laws/Chs.%2061-62/62.01/62.01%20aos.htm</a> ) | 4 of 1970, 16 of 1974, 38 of 1974, 34 of 1975, 27 of 1976, 9 of 1979, 45 of 1979, 47 of 1980, 29 of 1988, 14 of 1990, 34 of 1995 8 of 1996, 79 of 2000.                       | Sets out the basic legislative framework governing the administrative (e.g. licensing regimes) and operational (clauses which deal with health and safety and good practices) aspects of the energy and energy related sectors; the Ministry of Energy is directly responsible for administering this act.         |
|  | The Petroleum Taxes Act Chapter 75:04 ( <a href="http://rgd.legalaffairs.gov.tt/Laws/Chs.%2074-78/75.04/75.04%20aos.htm">http://rgd.legalaffairs.gov.tt/Laws/Chs.%2074-78/75.04/75.04%20aos.htm</a> )            | 30 of 1974, 16 of 1975, 46 of 1976, 47 of 1980, 5 of 1981, 28 of 1984, 26 of 1985, 16 of 1987, 11 of 1988, 27 of 1988, 6 of 1989, 15 of 1992, 8 of 1996, 9 of 1997, 5 of 2004 | The Petroleum Taxes Act is the main piece of legislation governing the collection of taxes from petroleum companies operating in Trinidad and Tobago. The Act applies to all companies engaged in the exploration, production, refining and marketing of petroleum and petroleum products <sup>11</sup> ; See part |

|  | Original Legislation   | Amendments  | Purpose   |
|--|--|---|---|
|  |  |   | I for the Taxation of Petroleum operations.<br><br>This Act first separated petroleum from all other company taxation. At that time the Government established provisions aimed at capturing a share of the windfall profits earned by petroleum producers.   |
|  | The Income Tax Act Chapter 75:01 ( <a href="http://rgd.legalaffairs.gov.tt/Laws/Chs.%2074-78/75.01/75.01%20aos.htm">http://rgd.legalaffairs.gov.tt/Laws/Chs.%2074-78/75.01/75.01%20aos.htm</a> ) | 6 of 1991, 17 of 1992, 25 of 1992, 6 of 1993, 22 of 1993, 3 of 1994, 14 of 1994, 22 of 1994, 5 of 1995, 8 of 1996, 9 of 1997, 33 of 1997, 38 of 1997, 4 of 1998, 35 of 1998, 36 of 2000, 39 of 2000, 50 of 2000, 91 of 2000, 2 of 2002, 15 of 2003, 20 of 2003, | Sets the legislative framework governing taxes levied on all sectors of the economy including the energy and energy related sector. The BIR is responsible for administering this act. Even though the Minister cannot override any of these Acts, cabinet has the power to waive income tax in very extraordinary circumstances. |

<sup>11</sup> However, the Exploration and Production business is taxed separately from the refining and marketing business. It is important to note that companies engaged in the transportation and sales of natural gas (NGC), the manufacture of petrochemicals (ammonia and methanol) or the processing of natural gas (PPGPL and ALNG) do not fall under the umbrella of the Petroleum Taxes Act. When the government therefore provides figures for “government oil revenue”, such data do not include taxes collected from these companies. It follows therefore that the bulk of what we see as Government oil sector revenues is in fact collected from the oil and gas producing companies.

|         | Original Legislation  | Amendments   | Purpose  |
|---------|---|--|--|
|         |   | 5 of 2004  |  |
|         | The Income Tax (In Aid of Industry) Act Chapter 85:04 ( <a href="http://rgd.legalaffairs.gov.tt/Laws/Chs.%2085-87/85.04/85.04%20aos.htm">http://rgd.legalaffairs.gov.tt/Laws/Chs.%2085-87/85.04/85.04%20aos.htm</a> ) | Since 1962: 2/1963, 5 of 1964, 29 of 1966, 46 of 1969, 5 of 1970, 42 of 1970, 106/1974, 46 of 1976, 6 of 1981, 11 of 1984, 26 of 1985, 17 of 1992, *5 of 1995, 39 of 2000, 2 of 2002 | An Act to make provisions for relief from Income Tax to support the growth of certain sectors (including the petroleum industry) by providing accelerated capital depreciation and other tax benefits; See parts IIA, III, IV; Revised in 2006.. This was to grant incentives to Industry;   |
|         | The Fiscal Incentives Act Chapter 85:01 ( <a href="http://rgd.legalaffairs.gov.tt/Laws/Chs.%2085-87/85.01/85.01%20aos.htm">http://rgd.legalaffairs.gov.tt/Laws/Chs.%2085-87/85.01/85.01%20aos.htm</a> )               | 11 of 1984, 14 of 1994, 23 of 2006, 21 of 2007   | This Act is meant to grant (fiscal) incentives in areas which government promotes investment and economic and development. This act entitled qualified companies to either full or partial relief from corporation tax and customs duties.   |
|         | The Exchequer and Audit Act Chapter 69:01 ( <a href="http://rgd.legalaffairs.gov.tt/Laws/Chs.%2069-73/69.01/69.01%20aos.htm">http://rgd.legalaffairs.gov.tt/Laws/Chs.%2069-73/69.01/69.01%20aos.htm</a> )             | Since independence in 1962: 8/1962, 97/1963, 25 of 1964, 18 of 1966, 7/1978, 3/1979, 4/1979, 5/1979, 185/1979, 152/1982, 18/1984, 90/1989, 18 of 1998, 23 of 1998                    | An Act to provide for the control and management of the public finances of Trinidad and Tobago; for the duties and powers of the Auditor General; for the collection, issue and payment of public monies; for the audit of public accounts and the protection and recovery of public property; for the control of the powers of statutory bodies; and for matters connected therewith. |
|         | The Heritage and Stabilisation Fund Act of 2007 ( <a href="http://www.ttparliament.org/bills/acts/2007/a2007-06.pdf">http://www.ttparliament.org/bills/acts/2007/a2007-06.pdf</a> )                                   |  | This Act provides the legal framework for the HSF. It includes specific rules of accumulation, investments and withdrawals. The Fund is meant to buffer the impact of revenue volatility derived from changing petroleum prices while putting aside savings for future generations after the nation's petroleum reserves run out.  |
| Foreign | The Foreign Investment Act  |  | An act to provide for the  |

|            | <b>Original Legislation</b>  | <b>Amendments</b>  | <b>Purpose</b>   |
|------------|--|--|--|
| Investment | Chapter 70:07<br>( <a href="http://rgd.legalaffairs.gov.tt/Laws/Chs.%2069-73/70.07/70.07%20aos.htm">http://rgd.legalaffairs.gov.tt/Laws/Chs.%2069-73/70.07/70.07%20aos.htm</a> )   |  | acquisition of any interest in land or shares in local state or private companies by foreign investors and also to facilitate investment by citizens of CARICOM member countries.  |
|            | The Petroleum Production Levy and Subsidy Act Chapter 62:02<br>( <a href="http://rgd.legalaffairs.gov.tt/Laws/Chs.%2061-62/62.02/62.02%20aos.htm">http://rgd.legalaffairs.gov.tt/Laws/Chs.%2061-62/62.02/62.02%20aos.htm</a> ) | 34 of 1975, 6/1984, 16 of 1992, 195/2003, 249/2004                   | This Act imposes a levy on companies in the petroleum business; this levy is used to fund the subsidy on petroleum products. This Act is administered by the specialist petroleum commission in BIR.   |
|            | The Unemployment Levy Act Chapter 75:03<br>( <a href="http://rgd.legalaffairs.gov.tt/Laws/Chs.%2074-78/75.03/75.03%20aos.htm">http://rgd.legalaffairs.gov.tt/Laws/Chs.%2074-78/75.03/75.03%20aos.htm</a> )                     | 22 of 1974, 1 of 1979, 47 of 1980, 2 of 1982, 6 of 1989, 11 of 1998. | This act was initially imposed as a means of funds to support welfare spending for the large number unemployed at the start of the seventies. The revenue retained from this act is used to provide training and relief employment for the unemployed; <sup>12</sup> It now only applies to petroleum companies; |
|            | The Minerals Act No. 61 of 2000, Chapter 61:03<br>( <a href="http://rgd.legalaffairs.gov.tt/Laws/Chs.%2061-62/61.03/61.03%20aos.htm">http://rgd.legalaffairs.gov.tt/Laws/Chs.%2061-62/61.03/61.03%20aos.htm</a> )              |  | Provides the legal framework governing and regulating the minerals sector in T&T; notably, it regulates all aspects of quarrying; the minerals sector presently falls under the purview of the min of energy, which administers this act. Deals mainly regulations of the quarry industry                        |

<sup>12</sup> It authorised a levy as a percentage on the chargeable income of companies of a certain size. The amount is calculated before the deduction of losses from the chargeable profits. Additionally, the levy must be paid on profits or gains exempted from tax under special incentive legislation, since the levy is not an allowable deduction for income tax or corporation tax.

|   | <b>Original Legislation</b>  | <b>Amendments</b> | <b>Purpose</b>   |
|---|--|-------------------|--|
| Transparency and prevention of corruption | The Freedom of Information Act, Chapter 22:02, ( <a href="http://rgd.legalaffairs.gov.tt/Laws/Chs.%2020-22/22.02/22.02%20aos.htm">http://rgd.legalaffairs.gov.tt/Laws/Chs.%2020-22/22.02/22.02%20aos.htm</a> )<br><br>No. 26 of 1999 ( <a href="http://www.ttparliament.org/bills/acts/1999/a1999-26.pdf">http://www.ttparliament.org/bills/acts/1999/a1999-26.pdf</a> ) |                   | It provides members of the public with their legally enforceable rights to gain access to information from public sector entities. The Act is, however, limited by the requirement to protect certain public interests, as in national security issues, or private interests which may infringe the constitutional rights of an individual. <sup>13</sup>  |
|   | Integrity in Public Life Act, Chapter 22:01, ( <a href="http://www.ttparliament.org/bills/acts/2000/a2000-83.pdf">http://www.ttparliament.org/bills/acts/2000/a2000-83.pdf</a> )   | 83 of 2000        | Complementing the Prevention of Corruption Act, it provides for the establishment of the Integrity Commission; to make new provisions for the prevention of corruption of persons in public life by providing for public disclosure; to regulate the conduct of persons exercising public functions; to preserve and promote the integrity of public officials and institutions, and for matters incidental thereto. |
|   | The Prevention of Corruption Act, Chapter 11:11, ( <a href="http://rgd.legalaffairs.gov.tt/Laws/Chs.%2010-13/11.11/11.11%20aos.htm">http://rgd.legalaffairs.gov.tt/Laws/Chs.%2010-13/11.11/11.11%20aos.htm</a> )   | 21 of 2001,       | Act Introduced in 1987, becoming the main act legislating for the prevention of corruption; The amendment 21 of 2001 established a Commission for receiving and investigating allegations of   |

<sup>13</sup> The state must respond within 30 days. If the state does not respond, the requester has the right to take it further legally. However, there are many exceptions to the rule present in the Act, which the state may apply in its defense, if deemed necessary.

|                 | Original Legislation   | Amendments | Purpose   |
|-----------------|--|------------|---|
|                 |  |            | corruption; increasing the number of corruption and corruption related offences; providing protection for informers or “whistleblowers”. Work is still being done on the acts.  |
| The Environment | The Environment Management Act No. 3 of 2000 Chapter 35:05<br>( <a href="http://rgd.legalaffairs.gov.tt/Laws/Chs.%2035-38/35.05/35.05%20aos.htm">http://rgd.legalaffairs.gov.tt/Laws/Chs.%2035-38/35.05/35.05%20aos.htm</a> )        |            | All energy-related projects (including quarrying) with environmental impact from the petroleum sector must go to the EMA for approval before the project gets the go ahead. Factors environmental conservationist concerns into the development of the legal, regulatory and institutional framework governing public and private decisions; it established the Environmental Management Authority (EMA); <sup>14</sup> |
|                 | Oil Pollution and Territorial Waters Act 25 of 1951 Chapter 37:03<br>( <a href="http://rgd.legalaffairs.gov.tt/Laws/Chs.%2035-38/37.03/37.03%20aos.htm">http://rgd.legalaffairs.gov.tt/Laws/Chs.%2035-38/37.03/37.03%20aos.htm</a> ) |            | An Act to make provision against the discharge or escape of oil into the waters of Trinidad and Tobago.   |

<sup>14</sup> Even though our laws are advanced, our implementation is lacking; for the most part, while the EMA approves or disapproves of the projects, irregular behaviour or outcomes which occur over the life of the project are not regulated.

### 3.8 Governance Structure

#### *Understanding good governance*

Definitions for governance abound. The consensus, however, is that governance is “the process of decision-making and the process by which decisions are implemented (or not implemented)”<sup>15</sup> involving, at the very least, “a capable state operating under the rule of law.”<sup>16</sup>

Among other forms, the World Bank recognizes good governance as the following:

“clear and stable laws and regulations; the rule of law; a high level of competence in government; fiscal and budgetary and monetary discipline; public-private sector balance in the economy; open dialogue between government and civil society; and a high degree of transparency.”<sup>17</sup>

For instance, the World Bank’s Governance Matters 2007 measures good governance quantitatively using indicators of:

- Voice & Accountability,
- Political Stability and Lack of Violence/Terrorism,
- Government Effectiveness,
- Regulatory Quality, and
- Rule of Law.

One dimension cannot be evaluated without reference to another of the factors listed above.

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<sup>15</sup> United Nations Economic and Social Commission for Asia and the Pacific, *What is good governance?* <http://www.unescap.org/pdd/prs/ProjectActivities/Ongoing/gg/governance.asp> (Date accessed: May 19, 2008).

<sup>16</sup> Daniel Kaufmann, Aart Kraay, *Governance Indicators: Where are we, where should we be going?* <http://info.worldbank.org/governance/wgi2007/pdf/GovernanceIndicatorsSurvey.pdf> (Date accessed: May 28, 2008).

<sup>17</sup> World Bank, Angola: Oil, Broad-based growth, and equity, (Washington DC: The World Bank), 2007, p. 48.

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### 3.8.1 The importance of good governance for petroleum-rich countries

Petroleum-rich countries of the developing world do not score well against these governance indicators. Weak performance against such indicators points to a larger probability that other economic development initiatives will be undermined. Furthermore, intensified resource-driven growth in countries correlates with a lower quality of governance and economic development. For instance, US petroleum companies earned higher returns on foreign direct investment (FDI) in countries with weaker governance performance. In other words, it follows that in countries with weak governance, governments take less (through taxes) off the profits of such companies.

Resource-rich countries which combine good governance and institutional strengthening with economic policies enjoy better and more effective economic development than do those lacking that combination.<sup>18</sup>

### 3.8.2 Governance and the Trinidad and Tobago energy sector

No governance model has been officially adopted in Trinidad and Tobago. Legislation and public policy statements, however, indicate that the Government is keen to pursue good governance:

- In the 2005 Budget speech, the Minister of Finance proposed to compensate and recover the value lost from the petroleum sector before 2005, by building State capacity to:
  - review and re-negotiate all existing Production Sharing Contracts (PSCs);
  - re-activate the Petroleum Crude Oil Pricing Committee;
  - monitor the exports of crude oil on a destination basis; and
  - review the tax liability of the oil companies from 1999-2005.
- In the same Budget, the Minister indicated the government's intention to consider a proposed design of the governance structure and the investment criteria of the Heritage and Stabilization Fund. A Board of Trustees, chaired by the Minister of Finance, was to oversee the management of the Fund.

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<sup>18</sup> Paul Stevens and Evelyn Dietsche, *Resource curse: an analysis of causes, experiences and possible ways forward*, Energy Policy 36 (2008): 56-65.

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- The Prime Minister declared government’s commitment to a “quality of governance that reflects the highest standard of ethics, transparency and accountability.”<sup>19</sup>
  - State enterprises have been mandated to publish a summary of their un-audited half-yearly financial statements within two months of the mid-year date, and a summary of their audited financial statement within four months of the end of their financial year.
  - In 2003, the government of Trinidad and Tobago, as well as many of the multinational corporations, set out to support (joint public-private sector initiative) the Extractive Industries Transparency Initiative (EITI), to develop a reporting format for revenues generated in the extractive industries and particularly in the energy sector.
  - The government enacted the Freedom of Information Act, and has set out to overhaul both the Prevention of Corruption Act (11 of 1987) and the Integrity in Public Life Act (83 of 2000) – which provide the legal mechanism for the prevention of corruption in Trinidad and Tobago – to be in keeping with the EITI’s mandate.<sup>20</sup>

### **3.8.3 Governance and the Trinidad and Tobago energy sector: Decision-making model**

The structure of the government’s decision-making model, as of 2007, was presented as laid out below by the then Minister of Energy, Dr Lenny Saith.

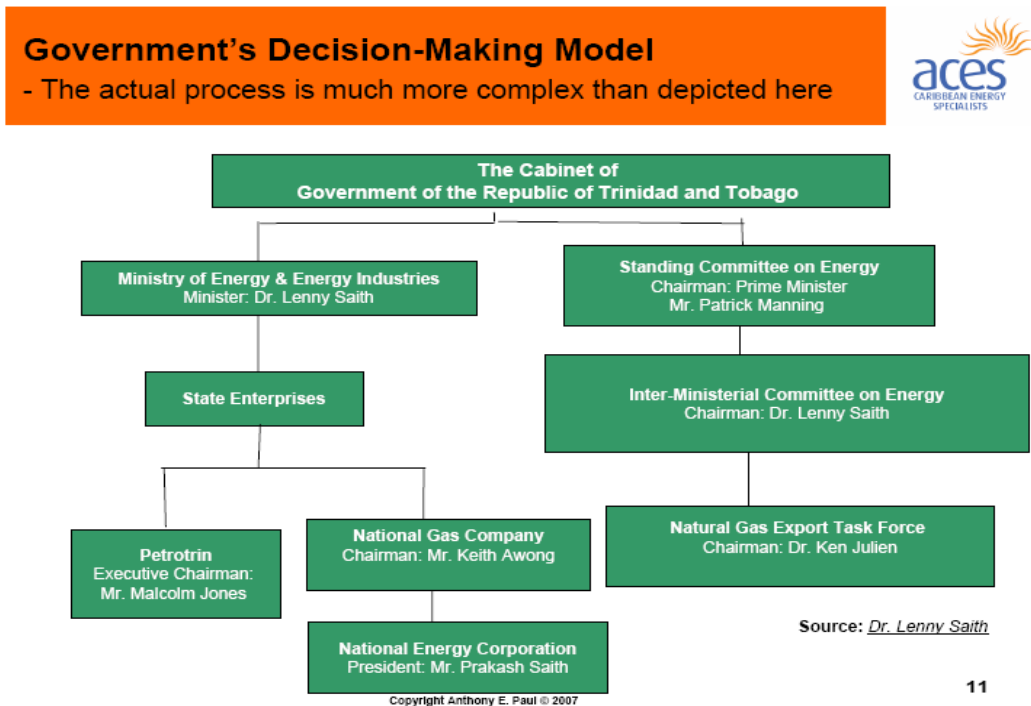
The creation of government policy goes through Cabinet for approval in the form of Cabinet Notes. Changes, approvals or disapprovals will be made and this is communicated to the policy makers. Until a decision is taken, and the minutes from the meeting confirmed, the Notes are filed, and both remain confidential. Following the communication of the decisions, implementation times vary amongst projects given the go-ahead.

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<sup>19</sup> Prime Minister of Trinidad and Tobago, Budget Speech, 2005-06

<sup>20</sup> UK Department for International Development (DFID), Draft Report of the Extractive Industries Transparency Initiative (EITI), *Statement by Senator the Honourable Christine Sahadeo Minister in the Ministry of Finance*. London Conference, 17 June 2003, <http://www.dfid.gov.uk/pubs/files/eitidraftreporttrinidad.pdf> (Date accessed: June 16, 2008)

Figure 34: Government Energy Sector Decision-Making Framework



Source: Anthony Paul Association of Caribbean Energy Specialists(2007)\*

The Prime Minister chairs the standing committee on energy. Also on this committee are the Permanent Secretary in the Ministry of Energy and Energy Industries (MEEI); the Minister of MEEI; the heads of various state companies (Petrotrin, NGC etc); the Permanent Secretary in the Ministry of Finance; and the Minister of Finance (not included in the diagram above).

The Natural Gas Export Task Force (headed by Professor Ken Julien) plays a key role in advising the State enterprises and agencies. The MEEI regulates the sector. Government's implementation happens through each of the national companies such as Petrotrin, NGC, NEC, NP and National Quarries.

### 3.8.4 Governance and the Energy Sector: Vision 2020's Energy Sector goals

The Vision 2020 Energy Sub-Committee report provides a useful framework for advancing the issues of governance and transparency in the energy sector. The report identifies the following among its major goals:

- A robust and respected framework for governance that establishes and maintains a clear commitment to transparency and ethical behaviour (pp 94. Vision 2020 Energy Sub- Committee Report)
- Transparent governance of energy-related private and public sector institutions. (p. 97 Vision 2020 Energy Sub-Committee Report).

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The report also details specific objectives and initiatives for accomplishing these goals.

Vision 2020 Energy Sub-Committee Report is available at [http://www.vision2020.info.tt/cms/index.php?option=com\\_content&task=view&id=71&Itemid=80](http://www.vision2020.info.tt/cms/index.php?option=com_content&task=view&id=71&Itemid=80)

#### **4. WHERE CAN WE FIND INFORMATION?**

The information provided in this report has come from sources listed below.

- Handbook of key economic indicators, Central Bank of T&T, Central Bank special publication
- Review of the Economy, various issues, Ministry of Finance publication
- [www.central-bank.org.tt](http://www.central-bank.org.tt): Annual Economic Survey and Economic Bulletins
- [www.finance.gov.tt](http://www.finance.gov.tt): Review of the Economy
- [www.parliament.gov.tt](http://www.parliament.gov.tt): Finance Act and Heritage and Stabilization Act
- [www.potashcorp.com](http://www.potashcorp.com): Sustainability Reports (PCS Nitrogen)
- <http://mineral.usgs.gov/>: Statistics tables on Caribbean Mineral/Petrochemical Sector and Country Reports
- [www.fertilizer.org](http://www.fertilizer.org): International Fertilizer Industry Association
- [www.ttmethanol.com](http://www.ttmethanol.com): Methanol Holdings Limited
- [www.ngc.co.tt](http://www.ngc.co.tt): Gasco News and T&T Industry Updates
- [www.methanex.com](http://www.methanex.com): Methanex Annual Report, Titan and Atlas Methanol Plants
- [www.energy.gov.tt](http://www.energy.gov.tt)
- Ministry of Energy and Energy Industries Library: Oil and Gas Reserves, Well Activity, Ministry of Energy Annual Reports, Petrotrin Annual Reports, Tringen I & II data.
- [www.petrotrin.com](http://www.petrotrin.com): Financial Statements and Review

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<http://mineral.usgs.gov/>: Statistics tables on Caribbean Mineral/Petrochemical Sector and Country Reports

[www.fertilizer.org](http://www.fertilizer.org): International Fertilizer Industry Association

[www.ttmethanol.com](http://www.ttmethanol.com): Methanol Holding Limited

[www.ngc.co.tt](http://www.ngc.co.tt): Gasco News and T&T Industry Updates

[www.methanex.com](http://www.methanex.com): Methanex Annual Report, Titan and Atlas Methanol Plants

[www.energy.gov.tt](http://www.energy.gov.tt): Ministry of Energy and Energy Industries Library: Oil and Gas Reserves, Well Activity, Ministry of Energy Annual Reports, Petrotrin Annual Reports, Trigen I & II data.

[www.petrotrin.com](http://www.petrotrin.com): Financial Statements and Review

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## Appendix A: Tables

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**Table A1: Crude Oil WTI Spot Prices: 1988-2008 (US\$/bbl)**

| <b>Year</b> | <b>WTI Spot Price FOB (US\$/bbl)</b> |
|-------------|--------------------------------------|
| 1988        | 15.97                                |
| 1989        | 19.64                                |
| 1990        | 24.53                                |
| 1991        | 21.54                                |
| 1992        | 20.58                                |
| 1993        | 18.43                                |
| 1994        | 17.2                                 |
| 1995        | 18.43                                |
| 1996        | 22.12                                |
| 1997        | 20.61                                |
| 1998        | 14.42                                |
| 1999        | 19.34                                |
| 2000        | 30.38                                |
| 2001        | 25.98                                |
| 2002        | 26.18                                |
| 2003        | 31.08                                |
| 2004        | 41.51                                |
| 2005        | 56.64                                |
| 2006        | 66.05                                |
| 2007        | 72.34                                |
| 2008        | 99.67                                |

**Source:** Energy Information Administration ([www.eia.doe.gov](http://www.eia.doe.gov))

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**Table A2: Natural Gas Spot Prices (Henry Hub): 1994-2008**

| <b>Year</b> | <b>Spot Price (US\$/bbl)</b> |
|-------------|------------------------------|
| 1994        | 1.93                         |
| 1995        | 1.69                         |
| 1996        | 2.50                         |
| 1997        | 2.48                         |
| 1998        | 2.16                         |
| 1999        | 2.32                         |
| 2000        | 4.31                         |
| 2001        | 4.05                         |
| 2002        | 3.37                         |
| 2003        | 5.49                         |
| 2004        | 6.18                         |
| 2005        | 9.01                         |
| 2006        | 6.98                         |
| 2007        | 7.11                         |
| 2008        | 8.90                         |

**Source:** Energy Information Administration ([www.eia.doe.gov](http://www.eia.doe.gov))

**TABLE A3:** Trends in GDP and in Oil and Gas Production: 1983-2008

| <b>Year</b>             | <b>GDP at Current Prices TT\$M</b> | <b>GDP at Constant Prices (2000) TT\$M</b> | <b>% change in GDP at Constant Prices</b> | <b>% change in Oil Production</b> | <b>% change in Gas Production</b> |
|-------------------------|------------------------------------|--|---|-----------------------------------|-----------------------------------|
| <b>1983</b>             | 18633.3                            | 18003.2                                    | -0.1                                      |                                   |                                   |
| <b>1985</b>             | 18071.2                            | 17460.1                                    | -4.5                                      |                                   |                                   |
| <b>1986</b>             | 17259.7                            | 16676.0                                    | 0.1                                       |                                   |                                   |
| <b>1987</b>             | 17271.9                            | 16687.8                                    | 0.1                                       |                                   |                                   |
| <b>1988</b>             | 17284.7                            | 16700.2                                    | 6.3                                       | -2.5                              |                                   |
| <b>1989</b>             | 18372.9                            | 17751.6                                    | 17.2                                      | -1.3                              | -2.3                              |
| <b>1990</b>             | 21539.3                            | 20810.9                                    | 4.7                                       | 0.7                               | -3.7                              |
| <b>1991</b>             | 22558.6                            | 21795.7                                    | 2.5                                       | -4.5                              | 10.3                              |
| <b>1992</b>             | 23117.6                            | 22335.8                                    | 5.9                                       | -5.4                              | 38.8                              |
| <b>1993</b>             | 24490.5                            | 23662.3                                    | 19.7                                      | -8.2                              | -5.2                              |
| <b>1994</b>             | 29311.7                            | 28320.5                                    | 8.1                                       | 5.6                               | 8.7                               |
| <b>1995</b>             | 31697                              | 30625.1                                    | 9.1                                       | 0.2                               | 4.0                               |
| <b>1996</b>             | 34586.6                            | 33417.0                                    | 3.7                                       | -2.2                              | 13.0                              |
| <b>1997</b>             | 36626.2                            | 34657.8                                    | 6.1                                       | -4.0                              | 1.7                               |
| <b>1998</b>             | 38065.1                            | 36777.9                                    | 12.7                                      | -0.7                              | 12.0                              |
| <b>1999</b>             | 42889.1                            | 41438.7                                    | 19.8                                      | 1.8                               | 28.6                              |
| <b>2000</b>             | 51370.6                            | 49633.5                                    | 7.1                                       | -4.6                              | 16.9                              |
| <b>2001</b>             | 55007.2                            | 53147.1                                    | 0.7                                       | -4.9                              | 6.5                               |
| <b>2002</b>             | 56290.0                            | 53493.3                                    | 19.5                                      | 15.1                              | 14.4                              |
| <b>2003</b>             | 71169.0                            | 63930.7                                    | 16.2                                      | 2.7                               | 42.1                              |
| <b>2004<sup>f</sup></b> | 83652.5                            | 74292.1                                    | 17.6                                      | -8.3                              | 12.9                              |
| <b>2005<sup>f</sup></b> | 100385.9                           | 87395.7                                    | 26.6                                      | 17.1                              | 9.9                               |
| <b>2006<sup>f</sup></b> | 122108.0                           | 110603.3                                   | 5.5                                       | -1.1                              | 20.5                              |
| <b>2007<sup>f</sup></b> | 137426.7                           | 116686.2                                   |   | -15.9                             | 5.5                               |
| <b>2008<sup>p</sup></b> | 152115.2                           |  |   | -4.6                              | -0.8                              |

Source: Central Bank of Trinidad and Tobago Annual Economic Survey Various Issues [www.central-bank.org.tt](http://www.central-bank.org.tt), and Authors' Calculations

**TABLE A4: Share of Hydrocarbon (Oil & Gas) Revenue in total Government Revenue 1981-2008 (\$mn)**

| <b>Year</b> | <b>Total Current Revenue TT\$M</b> | <b>Hydro-Carbon Revenue TT\$M</b> | <b>Hydro-Carbon Rev as % of Current Rev</b> |
|-------------|------------------------------------|-----------------------------------|---|
| 1981        | 6628.5                             | 4253                              | 64.2  |
| 1982        | 6686.8                             | 3274.2                            | 49.0  |
| 1983        | 6322.8                             | 2461.4                            | 38.9  |
| 1984        | 6548.4                             | 2759.7                            | 42.1  |
| 1985        | 6361.2                             | 2457.1                            | 38.6  |
| 1986        | 5234.6                             | 1690.6                            | 32.3  |
| 1987        | 5232                               | 1958                              | 37.4  |
| 1988        | 4936.9                             | 1538.3                            | 31.2  |
| 1989        | 4972.3                             | 2004.2                            | 40.3  |
| 1990        | 5534                               | 2317.5                            | 41.9  |
| 1991        | 6734.4                             | 2717.5                            | 40.4  |
| 1992        | 6083.2                             | 1817.6                            | 29.9  |
| 1993        | 6721                               | 1802.5                            | 26.8  |
| 1994        | 7504.8                             | 1895.9                            | 25.3  |
| 1995        | 8455.8                             | 2535.9                            | 30.0  |
| 1996        | 9536.8                             | 3060.7                            | 32.1  |
| 1997        | 9125.9                             | 2069.8                            | 22.7  |
| 1998        | 9629.4                             | 1706.9                            | 17.7  |
| 1999        | 9613.2                             | 1999.7                            | 20.8  |
| 2000        | 11954.1                            | 3761.1                            | 31.5  |
| 2001        | 13956.5                            | 4583.8                            | 32.8  |
| 2002        | 13825.0                            | 3249.4                            | 23.5  |
| 2003        | 16754.2                            | 6182.5                            | 36.9  |
| 2004        | 20625.6                            | 7641.7                            | 37.0  |
| 2005        | 29638.8                            | 13961.3                           | 47.1  |
| 2006        | 38906.9                            | 21416.0                           | 55.0  |
| 2007        | 40034.8                            | 20079.2                           | 50.2  |
| 2008        | 55546.4                            | 30287.0                           | 54.5  |

Source: Central Bank of Trinidad and Tobago Annual Economic Survey Various Issues [www.central-bank.org.tt](http://www.central-bank.org.tt), and Author's Calculations

**Table A5: Oil & Gas Foreign Exchange Earnings and Payments 1983-2008 (\$mn)**

| Year | Foreign Exchange Earnings | Hydro-Carbon Exports | Hydro-Carbon Exports as % of FEE | Net Factor Payments |
|------|---------------------------|----------------------|----------------------------------|---------------------|
| 1983 | 5646.3                    | 4714.5               | 83.5                             |                     |
| 1984 | 5216.2                    | 4735.7               | 90.8                             |                     |
| 1985 | 5247.1                    | 4180.9               | 79.7                             |                     |
| 1986 | 4988.6                    | 3529.3               | 70.7                             |                     |
| 1987 | 5264.6                    | 3749.1               | 71.2                             |                     |
| 1988 | 5423.5                    | 3279.6               | 60.5                             |                     |
| 1989 | 6706.9                    | 4089.9               | 61.0                             |                     |
| 1990 | 8850.9                    | 5932.1               | 67.0                             |                     |
| 1991 | 8429.9                    | 5497.1               | 65.2                             |                     |
| 1992 | 7942.9                    | 5099.3               | 64.2                             |                     |
| 1993 | 8534.6                    | 4820.2               | 56.5                             |                     |
| 1994 | 11575.4                   | 5690.5               | 49.2                             | 2596.1              |
| 1995 | 14608.6                   | 6990.2               | 47.8                             | 2915.6              |
| 1996 | 15014.4                   | 7547                 | 50.3                             | 3135.8              |
| 1997 | 15887.3                   | 7319.6               | 46.1                             | 2490.0              |
| 1998 | 14220.5                   | 6310.3               | 44.4                             | 2167.2              |
| 1999 | 17661.2                   | 9554.8               | 54.1                             | 2516.2              |
| 2000 | 26923.5                   | 17575                | 65.3                             | 3950.1              |
| 2001 | 26706                     | 16394                | 61.4                             | 3350.3              |
| 2002 | 24062.3                   | 14459                | 60.1                             | 2981.2              |
| 2003 | 32600.3                   | 21735                | 66.7                             | 4264.7              |
| 2004 | 40144.4                   | 24210                | 60.3                             | 2491.7              |
| 2005 | 42391                     | 37728                | 88.9                             | 4762.0              |
| 2006 | 76473.3                   | 69591                | 91.0                             | 5877.7              |
| 2007 | 83024                     | 71400                | 86.7                             | 6072.1              |
| 2008 |                           |                      |                                  | 5612.5              |

Source: Central Bank of Trinidad and Tobago Annual Economic Survey, Various Issues  
[www.central-bank.org.tt](http://www.central-bank.org.tt), and Authors' Calculations

**TABLE A6: Distribution of Foreign Direct Investment by sector (1985-2006)**

| <b>Year</b> | <b>Total FDI</b> | <b>Petroleum Industries (%)</b> | <b>Food, Drink &amp; Tobacco (%)</b> | <b>Chemicals &amp; non-metallic Minerals (%)</b> | <b>Assembly type &amp; related industries (%)</b> | <b>Distribution (%)</b> | <b>All other sectors (%)</b> |
|-------------|------------------|---------------------------------|--------------------------------------|--|---|-------------------------|------------------------------|
| 1985        | 121.7            | 71.08                           | 0.49                                 | 5.34   | -0.82   | 0.33                    | 23.58                        |
| 1987        | 119.3            | 72.93                           | 8.2                                  | 2.51   | 4.19  | -1.84                   | 14.00                        |
| 1988        | 267.8            | 79.46                           | 6.65                                 | 0.41   | -1.76   | -0.63                   | 6.16                         |
| 1989        | 630.7            | 58.41                           | 1.59                                 | -0.35  | 0.10  | 0.38                    | 40.21                        |
| 1990        | 465              | 58.45                           | 7.73                                 | -58.10   | 1.64  | -1100.00                | 8290.91                      |
| 1991        | 770.6            | 69.01                           | 1.49                                 | -0.30  | 0.25  | -0.17                   | 9.20                         |
| 1992        | 1003.8           | 89.59                           | -0.29                                | 0.18   | 0.18  | 0.94                    | 9.41                         |
| 1993        | 2194.6           | 93.64                           | 0.51                                 | 0.03   | -0.11   | 1.13                    | 4.80                         |
| 1994        | 3120.8           | 52.80                           | 1.09                                 | 24.70  | -0.37   | 0.19                    | 21.57                        |
| 1995        | 1848.1           | 89.96                           | 1.08                                 | 0.57   | -0.14   | 2.10                    | 6.43                         |
| 1996        | 2237.6           | 93.94                           | 1.21                                 | 0.64   | 0.20  | 1.23                    | 2.78                         |
| 1997        | 6267.5           | 95.46                           | 0.84                                 | 0.23   | -0.01   | 0.31                    | 3.17                         |
| 1998        | 4596.3           | 76.47                           | 1.24                                 | 0.30   | -0.01   | 0.27                    | 16.26                        |
| 1999        | 2320             | 124.99                          | 1.02                                 | 0.78   | 0.03  | -0.13                   | 45.25                        |
| 2000        | 4063.2           | 93.80                           | -3.26                                | 0.28   | -2.8  | 0.26                    | 15.59                        |
| 2001        | 4870.5           | 104.08                          | -2.22                                | 1.69   | -1800.00  | 9.06                    | 6209.68                      |
| 2002        | 4290.6           | 106.84                          | 0.52                                 | 0.22   | 1.17  | -0.10                   | 5.79                         |
| 2003        | 3656             | 126.45                          | 0.82                                 | 0.33   | 0.91  | 0.38                    | 9.52                         |
| 2004        | 6128             | 93.55                           | 0.59                                 | 0.23   | 0.89  | 0.28                    | 4.07                         |
| 2005        | 5661.8           |                                 |                                      |  |   |                         |                              |
| 2006        | 3240.3           |                                 |                                      |  |   |                         |                              |

Source: Central Bank of Trinidad and Tobago, Annual Economic Survey, Various Issues  
[www.central-bank.org.tt](http://www.central-bank.org.tt)

**TABLE A 7: Gross Capital Formation & Foreign Direct Investment 1981-2006**

| Year | Gross Capital Formation TT\$M | Foreign Direct Investment TT\$M | FDI as % GFCF |
|------|-------------------------------|---------------------------------|---------------|
| 1981 | 4672                          | 439.9                           | 9.4           |
| 1982 | 5691.4                        | 506.4                           | 8.9           |
| 1983 | 4790.1                        | 195.6                           | 4.1           |
| 1984 | 4465.1                        | 271.7                           | 6.1           |
| 1985 | 3390.9                        | 121.7                           | 3.6           |
| 1986 | 3727.9                        | 71.7                            | 1.9           |
| 1987 | 3338.1                        | 119.3                           | 3.6           |
| 1988 | 2255.5                        | 267.8                           | 11.9          |
| 1989 | 3045.1                        | 630.7                           | 20.7          |
| 1990 | 2974.7                        | 465.0                           | 15.6          |
| 1991 | 3679.8                        | 770.6                           | 20.9          |
| 1992 | 3188.8                        | 1003.8                          | 31.5          |
| 1993 | 3515.7                        | 2194.6                          | 62.4          |
| 1994 | 5921.5                        | 3120.8                          | 52.7          |
| 1995 | 6587.1                        | 1848.1                          | 28.1          |
| 1996 | 8395.1                        | 2237.6                          | 26.7          |
| 1997 | 10802.1                       | 6267.5                          | 58.0          |
| 1998 | 12707.1                       | 4596.3                          | 36.2          |
| 1999 | 9010.9                        | 2320.0                          | 25.7          |
| 2000 | 8622.7                        | 4063.2                          | 47.1          |
| 2001 | 14694.2                       | 4870.5                          | 33.1          |
| 2002 | 12735.7                       | 4290.6                          | 33.7          |
| 2003 | 17926.3                       | 3656.0                          | 20.4          |
| 2004 | 13906.3                       | 6128.0                          | 44.1          |
| 2005 | 14748.7                       | 5661.8                          | 38.4          |
| 2006 | 15859.9                       | 3240.3                          | 30.4          |

Source: Trinidad and Tobago Balance of Payments Reports, Various Issues, Central Statistical Office and Central Bank of Trinidad and Tobago

**TABLE A8: Crude Oil Proved Reserves and RTP (1976-2008)**

| Crude Oil Proved Reserves and RTP |                 |                           |                            |              |
|-----------------------------------|-----------------|---------------------------|----------------------------|--------------|
| YEAR                              | Proved Reserves | Production<br>(000bbls/d) | Production Annual<br>MMbls | RTP<br>Years |
| 1976                              | 629             | 212                       | 77.4                       | 8            |
| 1977                              | 621             | 229.1                     | 83.6                       | 7            |
| 1978                              | 610             | 229.6                     | 83.8                       | 8            |
| 1979                              | 679             | 214.3                     | 78.2                       | 9            |
| 1980                              | 626             | 212                       | 77.4                       | 8            |
| 1981                              | 571             | 189.2                     | 69.1                       | 8            |
| 1982                              | 571             | 177                       | 64.6                       | 9            |
| 1983                              | 570             | 159.8                     | 58.3                       | 10           |
| 1984                              | 612             | 169.1                     | 61.7                       | 10           |
| 1985                              | 564             | 176.3                     | 64.3                       | 9            |
| 1986                              | 528             | 168.9                     | 61.6                       | 9            |
| 1987                              | 524             | 154.5                     | 56.4                       | 9            |
| 1988                              | 536             | 151.2                     | 55.2                       | 10           |
| 1989                              | 522             | 149.3                     | 54.5                       | 10           |
| 1990                              | 494             | 150.7                     | 55.0                       | 9            |
| 1991                              | 466             | 139.7                     | 51.0                       | 9            |
| 1992                              | 488             | 134.5                     | 49.1                       | 10           |
| 1993                              | 490             | 122.2                     | 44.6                       | 11           |
| 1994                              | 553             | 131.5                     | 48.0                       | 12           |
| 1995                              | 583             | 131.8                     | 48.1                       | 12           |
| 1996                              | 534             | 128.8                     | 47.0                       | 11           |
| 1997                              | 605             | 123.7                     | 45.2                       | 13           |
| 1998                              | 686             | 122.9                     | 44.9                       | 15           |
| 1999                              | 716             | 125.1                     | 45.7                       | 16           |
| 2000                              | 825             | 119.3                     | 43.5                       | 19           |
| 2001                              | 990             | 113.5                     | 41.4                       | 24           |
| 2002                              | 756             | 130.6                     | 47.7                       | 16           |
| 2003                              | 621             | 134.0                     | 48.9                       | 13           |
| 2004                              | 612             | 122.9                     | 44.9                       | 14           |
| 2005                              | 605             | 144.4                     | 52.7                       | 11           |
| 2006                              | 610             | 142.7                     | 52.1                       | 11.7         |
| 2007                              |                 | 120.0                     | 43.8                       |              |
| 2008                              |                 | 114.3                     | 41.7                       |              |

Source: Reservoir Engineering Section , Ministry of Energy and Energy Industries, Central Bank of Trinidad and Tobago, Annual Economic Survey (various issues)

1. Reserves are end of year estimates  
2. RTP - Reserves to Production ratio .

**TABLE A 9: PRODUCTION SHARING CONTRACTS 1995-2005**

| <b>BLOCKS</b>     | <b>ACREAGE<br/>(hectares)</b> | <b>EFFECTIVE<br/>DATE</b> | <b>Company/Consortium<br/>(Operator's name listed first)</b> |
|-------------------|-------------------------------|---------------------------|--|
| 2©                | 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<br>Fina 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

**Table A10: Trinidad and Tobago Production of Oil and Natural Gas (1991-2008)(excluding LNG)**

| Year | Crude Oil Production <sup>21</sup><br>(000 bbls/day) | Natural Gas<br>Billion Cu. Ft |
|------|--|-------------------------------|
| 1991 | 151  | 201                           |
| 1992 | 137.5  | 194.2                         |
| 1993 | 135  | 218                           |
| 1994 | 131.5  | 249.7                         |
| 1995 | 131.2  | 268                           |
| 1996 | 129.6  | 302.6                         |
| 1997 | 123.8  | 328.4                         |
| 1998 | 122.6  | 328.4                         |
| 1999 | 125  | 414.2                         |
| 2000 | 122  | 493.4                         |
| 2001 | 113.4  | 536.4                         |
| 2002 | 121.8  | 610.9                         |
| 2003 | 134.1  | 873.7                         |
| 2004 | 122.9  | 992                           |
| 2005 | 144.7  | 1069.3                        |
| 2006 | 142.7  | 1286.9                        |
| 2007 | 163.5  | 1377.3                        |
| 2008 | 165.4  | NA                            |

**Sources:**  
 Ministry of Energy [www.energy.gov.tt](http://www.energy.gov.tt)  
 Central Bank of Trinidad and Tobago Annual Economic Survey various issues.  
 Energy Information Administration:  
[http://tonto.eia.doe.gov/country/country\\_energy\\_data.cfm?fips=TD](http://tonto.eia.doe.gov/country/country_energy_data.cfm?fips=TD)

<sup>21</sup> Includes condensate.

**Table A11: Natural Gas Reserves, Utilization and RTP (1976-2008)**

| <b>Years</b> | <b>Proved Reserves</b> | <b>Utilization</b> | <b>RTP</b> |
|--------------|------------------------|--------------------|------------|
|              | (tcf)                  | (tcf)              | (years)    |
| 1976         | 3.43                   | 0.03               | 110.6      |
| 1977         | 8.50                   | 0.03               | 257.5      |
| 1978         | 8.00                   | 0.04               | 199.9      |
| 1979         | 8.00                   | 0.05               | 153.8      |
| 1980         | 11.84                  | 0.06               | 211.4      |
| 1981         | 11.65                  | 0.06               | 200.8      |
| 1982         | 11.44                  | 0.09               | 133.1      |
| 1983         | 11.25                  | 0.10               | 109.3      |
| 1984         | 11.01                  | 0.14               | 79.4       |
| 1985         | 10.77                  | 0.14               | 77.6       |
| 1986         | 10.49                  | 0.14               | 74.5       |
| 1987         | 10.22                  | 0.14               | 73.8       |
| 1988         | 9.96                   | 0.15               | 64.7       |
| 1989         | 9.49                   | 0.16               | 60.3       |
| 1990         | 9.21                   | 0.16               | 56.4       |
| 1991         | 8.72                   | 0.18               | 48.7       |
| 1992         | 8.46                   | 0.19               | 45.3       |
| 1993         | 8.45                   | 0.18               | 45.8       |
| 1994         | 10.14                  | 0.21               | 48.3       |
| 1995         | 12.38                  | 0.22               | 57.3       |
| 1996         | 15.91                  | 0.25               | 63.9       |
| 1997         | 18.29                  | 0.26               | 70.2       |
| 1998         | 19.76                  | 0.31               | 64.7       |
| 1999         | 20.40                  | 0.37               | 55.7       |
| 2000         | 19.67                  | 0.46               | 42.9       |
| 2001         | 20.30                  | 0.54               | 37.3       |
| 2002         | 20.35                  | 0.63               | 32.4       |
| 2003         | 20.80                  | 0.92               | 22.6       |
| 2004         | 18.80                  | 1.04               | 18.1       |
| 2005         | 18.77                  | 1.11               | 17.0       |
| 2006         | 17.05                  | 1.34               | 12.7       |
| 2007         | 17.00                  | 1.40               | 12.1       |
| 2008         | 16.99                  | 1.39               | 12.4       |

Source: Ministry of Energy and Energy Industries.



**Table A12: Production of downstream Commodities (1996-2008)**

| Commodity  | 1996   | 1997   | 1998   | 1999   | 2000   | 2001   | 2002   | 2003    | 2004    | 2005   | 2006   | 2007   | 2008   |
|--|--------|--------|--------|--------|--------|--------|--------|---------|---------|--------|--------|--------|--------|
| <b>NGL (000 barrels)</b>                                     | 4459.7 | 4111.2 | 4150.3 | 5752.7 | 6992.8 | 7531.3 | 8607.6 | 10505.1 | 10686.8 | 9889.4 | 11251  | 12450  | 12720  |
| <b>Fertilizers (000 tonnes)</b>                              | 2674.2 | 2690.7 | 3246.7 | 3946.8 | 3827.5 | 4209.0 | 4662.0 | 4964.7  | 5335.6  | 5935.9 | 5799   | 5902   | 5599   |
| <b>Methanol (000 tonnes)</b>                                 | 1358.0 | 1520.3 | 1948.0 | 2136.1 | 2480.2 | 2788.9 | 2828.7 | 2845.7  | 3418.4  | 4694.8 | 6016   | 5933   | 5686   |
| <b>DRI (000 tonnes)</b>                                      | 954.5  | 1133.8 | 1023.1 | 1293.0 | 1524.8 | 2187.4 | 2316.3 | 2275.0  | 2336.5  | 2055.0 | 2071.5 | 2062.8 | 1601.0 |
| <b>Billets (000 tonnes)</b>                                  | 643.6  | 747.0  | 776.9  | 723.9  | 743.8  | 668.3  | 816.9  | 896.0   | 789.8   | 712.0  | 673.0  | 694.6  | 489.6  |
| <b>Wire Rods (000 tonnes)</b>                                | 575.4  | 668.0  | 649.9  | 638.2  | 630.8  | 604.8  | 704.5  | 640.9   | 616.2   | 472.1  | 485.7  | 510.3  | 272.0  |
| Source: Central Bank Annual Economic Survey (various issues) |        |        |        |        |        |        |        |         |         |        |        |        |        |



**Table A13: Prices of selected commodities 1995-2008 (US\$/Tonne)**

| For the Period | Ammonia FOB Caribbean | Methanol FOB Rotterdam | Billets FOB Latin America | Wire Rods FOB Latin America | Natural Gas Liquids |
|----------------|-----------------------|------------------------|---------------------------|-----------------------------|---------------------|
| 1995           | 199                   | 268                    | 237                       | 296                         |                     |
| 1996           | 188                   | 153                    | 222                       | 276                         |                     |
| 1997           | 161                   | 187                    | 222                       | 295                         |                     |
| 1998           | 118                   | 139                    | 221                       | 264                         |                     |
| 1999           | 91                    | 109                    | 177                       | 226                         |                     |
| 2000           | 146                   | 168                    | 190                       | 221                         | 62.82               |
| 2001           | 138                   | 203                    | 171                       | 221                         | 51.89               |
| 2002           | 111                   | 164                    | 194                       | 221                         | 47.49               |
| 2003           | 201                   | 257                    | 245                       | 278                         | 63.11               |
| 2004           | 252                   | 265                    | 367                       | 453                         | 80.77               |
| 2005           | 281                   | 284                    | 334                       | 396                         | 103.12              |
| 2006           | 278                   | 376                    | 392                       | 448                         | 112.33              |
| 2007           | 291                   | 434                    | 494                       | 530                         | 134.07              |
| 2008           | 545                   | 504                    | 863                       | 1174                        | N.A.                |

Source: Central Bank Annual Economic Survey, Central Bank Economic Bulletin (Various issues)

**TABLE A14: Fertilizer Companies in Trinidad and Tobago (2007)**

| Start Year | Investment Cost US\$ Million | Plant Capacity (MMtpa) | Plant Efficiency Mcf/tonne | Breakdown of Current Ownership   |                     |
|------------|------------------------------|------------------------|----------------------------|--|---------------------|
|            |                              |                        |                            | Foreign  | Local               |
| 1959       | n/a                          | 0.277                  | 61.9                       | Yara. ( Norway) 49%  | T&T Gov't 51%       |
| 1977       | 125                          | 0.5                    | 43.6                       | Yara (Norway). 49%   | T&T Gov't 51% (NEL) |
| 1981       | 333.3                        | 0.454                  | 47.5                       | Potash Corporation of Saskatchewan USA 100%  |                     |
| 1988       | 350                          | 0.454                  | 35.2                       | Yara (Norway) 49%  | T&T Gov't 51% (NEL) |
| 1996       | 75                           | 0.225                  | 52.7                       | Potash Corporation of Saskatchewan USA 100%  |                     |
| 1998       | 252                          | 0.62                   | 39.0                       | Potash Corporation of Saskatchewan USA 100%  |                     |
| 1984       |                              |                        |                            | Potash Corporation of Saskatchewan USA 100%  |                     |
| 1998       | 300                          | 0.715                  | 26.0                       | Terra Industries 50% USA ; Koch Mineral Services LLC USA 50%   |                     |
| 2002       | 300                          | 0.64                   | 35.1                       | A consortium of Clico Energy Comp. Ltd; Ferrrostell AG Germany; EOG Resources Inc; Kellogg Brown and Root USA, Koch Industries |                     |
| 2004       | 315                          | 0.66                   | 33.2                       | As above   |                     |

Source: MEEI

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**HERITAGE AND STABLISATION FUND:  
DID WE GET IT RIGHT?**

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**GREGORY MCGUIRE**

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## 1. INTRODUCTION

The Trinidad and Tobago economy is now in its 15<sup>th</sup> consecutive year of positive economic growth. Between 2003 and 2007, in particular, increases in production and prices of oil, natural gas and petrochemicals have generated macro-economic aggregates that have been quite impressive, even spectacular. Between 2002 and 2007 GDP growth has averaged 9 % per annum, Government revenue has tripled, net foreign exchange reserves have quadrupled, and the unemployment rate has declined to an all time low of 5.5 %. The rapid growth of the energy sector and by extension the Trinidad and Tobago economy over this period has been, ironically, a source of both great satisfaction and grave concern. The expansion of Government expenditure on both economic and social needs has ensured that the vast majority of citizens enjoy a share of the nation's wealth in some form or another. However, there has been growing apprehension concerning whether the authorities are investing captured economic rents sufficiently to stave off short run impacts of price fluctuations and, more importantly, to diversify the economy in order to avoid the inevitable medium to long run impacts of declining production and prices. To put it another way, are we striking the right balance between long term savings and immediate developmental needs?

These concerns are born out of the vivid memories of the painful recession that followed the last oil boom (1974-82) and the general wretched record of resource rich countries, the vast majority of which are now by widespread poverty despite abundant natural wealth. Mindful of what economists refer to as the “natural resource curse”, several Governments in old and emerging resource rich countries have established Natural Resource Funds (NRF) as part of their fiscal policy framework. The Government of Trinidad and Tobago did likewise with the establishment in 1999 of the Interim Revenue Stabilization Fund. This subsequently morphed into the Heritage and Stabilization Fund (HSF) which was legislated in March 2007. This essay provides a critical examination of the provisions of the HSF Act, highlights some of its weaknesses, and proposes possible solutions.

## 2. NATURAL RESOURCES AND ECONOMIC DEVELOPMENT

Countries in which the dominant economic sector is based on the exploitation of natural resources face at least three distinctive economic challenges. The first relates to the fact that natural resources are finite and subject to depletion. The consequent challenge is to achieve Inter and Intra Generational Equity. How best could one spread resource depletion and the income yield from resource exhaustion between the present and future generations? The second challenge relates to the inherent volatility of natural resource prices. Managing such volatility is difficult, particularly so for countries that are dependent on natural resources as a major source of income and foreign exchange. Governments are predisposed to increase expenditure rapidly in line with revenue during a resource driven boom. However, once in train, expenditure is difficult to reverse, resulting in heavy fiscal deficits and associated problems when resource prices collapse.

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The third challenge arises from the fact that natural resource based industries (particularly oil and gas) are highly capital intensive. While these industries are major sources of wealth, they cannot by themselves provide employment opportunities to absorb a significant portion of the labour force. The onus often falls on the Government to use the rents derived from the sector to expand state funded employment and social security. The result is often a ballooning of today's outlays and the concomitant reduction in savings. Natural resource funds are viewed as one instrument in the fiscal policy mix geared to meet the challenges outlined above.

## **2.1 Natural Resource Funds**

There are two popular types of natural resource funds- Stabilization Funds and Savings/Heritage Funds. A Stabilization Fund serves to build up a pool of resources which can be used to mitigate the impact of swings in government's revenue, which often arise because of volatile natural resource prices. Essentially, in years of high prices money is set aside and invested, to be withdrawn in years of low prices to make up planned revenue shortfall.

A Savings/Heritage Fund, on the other hand, is used to accumulate wealth for future generations through the investment of surpluses earned from the natural resource income. This type of fund directly addresses the intergenerational equity challenge and is governed by detailed guidelines for deposits to, investment of, and withdrawals from the Fund.

The growth in popularity and assets of natural resource based and other state owned funds over the last ten years has led to the emergence of a new term- "Sovereign Wealth Funds." A Sovereign Wealth Fund is a Government investment vehicle which is funded by foreign exchange assets and which manages these assets separately from the official reserves. As at the end of 2007, the Sovereign Wealth Fund Institute listed 52 SWFs, with a total asset value of US\$ 3.8 trillion, and of which Funds based on oil and gas accounted for US\$ 2.3 trillion or 60 per cent. Table 1 provides a listing of the world's top ten oil based funds. Abu Dhabi, Norway and Saudi Arabia, with joint assets of over US 1.4 trillion, stand out. Singapore (US\$ 489 billion), China (US\$ 274 billion) and Hong Kong (US\$ 177 billion) lead the list of countries that have non-commodity based Funds.

**Table 1: Top Ten Resource-Based Sovereign Wealth Funds**

| Country       | Fund Name                        | Assets<br>US\$ B | Source    | Inception<br>Year |
|---------------|----------------------------------|------------------|-----------|-------------------|
| UAE-Abu Dhabi | Abu Dhabi Investment Authority   | \$875.5          | Oil       | 1976              |
| Norway        | Government Pension Fund-(Global) | \$396.5          | Oil       | 1990              |
| Saudi Arabia  | SAMA Foreign Holdings            | \$365.2          | Oil       |                   |
| Kuwait        | Kuwait Investment Authority      | \$264.4          | Oil       | 1953              |
| Russia        | National Wealth Fund*            | \$162.5          | Oil/ Gas  | 2008              |
| Qatar         | Qatar Investment Authority       | \$ 60            | Oil/ Gas  | 2003              |
| Libya         | Libyan Investment Authority      | \$ 50            | Oil / Gas | 2006              |
| Algeria       | Revenue Regulation Fund          | \$47             | Oil & Gas | 2000              |
| Alaska        | Alaska Permanent Fund            | \$39.8           | Oil       | 1976              |
| Brunei        | Brunei Investment Agency         | 30.0             | Oil       | 1983              |

Notes: \*In 2008 Russia separated the National Wealth Fund from the Stabilization Fund. It is estimated that at the time of separation the asset value was around US\$ 300 billion

Source: Sovereign Wealth Institute [www.swfinstitute.org](http://www.swfinstitute.org)

### 3. TRINIDAD AND TOBAGO HERITAGE STABILISATION FUND (HSF)

On March 15<sup>th</sup> 2007 (the infamous Ides of March), the House of Representatives assented to the Heritage and Stabilization Fund Bill, bringing into law the Heritage Stabilization Fund.

The Purpose of the Fund was stated as follows:

- To cushion the impact on or sustain public expenditure capacity during periods of revenue downturn caused by a fall in prices of gas or oil.
- To generate an alternative scheme of income to support public expenditure capacity as a result of a revenue downturn caused by depletion of resources.
- To provide a heritage for future generations from savings and investments income derived from excess petroleum revenues.

Trinidad and Tobago has therefore chosen to combine the two purposes into one Fund.

The resources of the fund are to be derived from three sources. Firstly, monies transferred from the Interim Revenue Stabilization Fund, which was established in 1999 and had accumulated the sum of \$ US 1.3 billion at the end of fiscal year 2006. Secondly, petroleum revenues deposited

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into the Fund, and thirdly, assets acquired and earned from investments by the Fund. In the short to medium term, the petroleum revenues collected by Government from companies engaged in the petroleum business will be the most important source of income into the Fund.

There are however, some important terms that need to be qualified in order to understand what constitutes petroleum revenue and what does not. First, **Petroleum revenues**, for purposes of the HSF, means the aggregate of the supplemental petroleum tax, petroleum profits tax and royalties collected under the **Petroleum Taxes Act**. It does not include unemployment levy, the oil impost and signature bonuses. It also does not include taxes collected from petrochemical companies because these are taxed under the Income Tax Act. Secondly, the petroleum revenues refer to those taxes collected from firms engaged in the **Petroleum Business**, which is defined to mean the business of exploration for and the winning of petroleum and natural gas contracts. It does not include the liquefaction of natural gas or the conversion of natural gas into other products. What this means is that for the purposes of the HSF, taxes earned by Government from petrochemical companies and dividends earned by Government from state enterprises (NGC) and joint ventures (such as PPGPL, Tringen and ALNG) do not form the base from which the deposits to the HSF are determined. It is estimated that Government “petroleum revenue” could be 16 to 20% higher if the definition were to be widened to include petrochemical plants and the dividends and taxes from the NGC.

The main elements of the Fund may be conveniently described under three headings: Rules of Accrual, Rules of Withdrawal, and the Governance Arrangements.

### 3.1 Rules of Accrual

As indicated earlier, excess petroleum revenues are the main source of funding for the HSF. The HSF Act mandates the following:

- When actual petroleum revenues in each quarter of the financial year exceed the estimated petroleum revenues for that quarter by more than 10%, the excess revenue **shall** be deposited into the Fund.
- When actual revenues exceed estimated by less than 10%, the Minister **may** deposit all or part of excess into the Fund.
- A minimum of 60% of excess of the aggregate of excess revenues shall be deposited to the Fund in any financial year.
- Deposits shall be made no later than the end of month following the quarters for which the deposit was calculated.
- Price determination: Estimated petroleum revenue shall be calculated on the basis of a unit price for petroleum derived from an **eleven year moving average** for prices of natural gas and crude oil. These eleven years should be comprised of **five years prior** to the current financial year and the current year plus **five years following** the current year.

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### **3.2 Rules of Withdrawal**

The Rules of withdrawal determine the conditions under which Government may draw down from the deposits in the HSF.

- Withdrawals may be made from the Fund when petroleum revenues collected in any financial year fall below the estimated petroleum revenues for that financial year by at least 10%.
- The amount to be withdrawn is limited to the lesser of
  - 60% of the amount of shortfall of petroleum revenues for that year or
  - 25% of the credit balance of the Fund.
- No withdrawals may be made from the Fund in any financial year where the balance standing to the credit of the Fund would fall below US\$ one (1) billion if such withdrawal were to be made.

## **4. GOVERNANCE/MANAGEMENT**

It is best practice among countries with Natural Resource Funds to have the Fund managed either by the Central Bank directly or by a special purpose investment company established by the Central Bank. In the case of the T&T HSF, the Central Bank plays a key role in both the Governance and operational management of the Fund. The legislation stipulates the following:

- The Fund shall have a Board of Governors comprised of 5 members to be appointed by the President for a period of three years.
- It is mandatory that the Board must include one (1) member from the Central Bank and one (1) member from the Ministry of Finance.
- Three members would constitute a quorum and decisions would be made by majority vote.
- The Board shall determine the Governance structure and operational and investment guidelines of the Fund.
- The Board shall delegate its responsibility for the Management of the Fund to the Central Bank.

In terms of transparency and accountability, the rules provide for an annual audit by the Auditor General, as well as the submission of quarterly and annual financial statements to the Minister. The audited Annual Financial statements must be laid in Parliament within four months of the close of the financial year.

## **5. CRITIQUE OF FUND RULES**

Our critique of the HSF begins with the very definition of the “petroleum revenues”. If the intent of the Fund is to protect against fall in incomes from gas and oil, then the revenues so affected should be included in the base. Moreover, it is the Government more than anyone else who has

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promulgated the view that Trinidad and Tobago is now a ‘gas economy’. It is therefore contradictory to be seeking to capture revenue only on the upstream side of the business. A commanding case can be made for a redefinition of “petroleum revenues” to include:

- Taxes collected from downstream natural gas based plants.
- Taxes collected from the processing of LNG and NLG's.
- Dividends collected by the state from its equity holdings in the energy sector.
- Signature Bonuses paid by exploration companies for exploration rights.

A second concern is that the decision to have one fund with two purposes seems likely to disadvantage the Heritage portion. Firstly, one Fund with two purposes creates an unnecessary complexity to the Fund management function. In determining the optimal structure of the strategic investment portfolio, the Fund managers would always have to address the tensions between the different classes of investments required for the two purposes. The Heritage purpose is more amenable to longer term instruments, while the Stabilization purpose can be satisfied with more liquid, short term, near cash instruments. In the absence of any clear guidelines and with the ever present threat of a sudden collapse in prices, the Fund managers may well choose to be more conservative than necessary. As a result, returns on the Heritage portion of the Fund could be lower than might have been if the Fund managers were not burdened with the Stabilization objective. While the authorities in Trinidad and Tobago have chosen the commingled single fund, Russia, having satisfied itself that sufficient funds had been accumulated for the stabilization objective, created a separate National Wealth Fund to address the objective of intergenerational transfer. In 2006, Chile restructured its Copper Stabilization Fund, first established in 1985, into two separate funds: the Pension Reserve Fund and the Economic and Social Stabilization Fund.

The Heritage objective also seems to be compromised by the rules of accrual. By law, the Government is obligated to place money into the Fund ONLY if realized revenues are more than 10% above projected revenues. Such rules are standard if the objective is only for Stabilization. However, it does not work well for the Heritage objective. In some ways, a Heritage Fund is like a Pension Fund. Within the public service and in established firms, pension deductions and/or contributions are compulsory at all levels of remuneration. The amount is usually a fixed percentage of gross income. In like manner, if the purpose of the Heritage Fund is to provide for tomorrow's generation, which in the author's opinion should include the aged, then it seems logical that a contribution should be made every year regardless of the level of prices and Government revenues. A Heritage Fund should not be subjected to the volatility of prices, the tax regime or the discretion of the Minister. One option is to make allocations to the Heritage Fund on the basis of the current market value of a **fixed volume** of production. For example, in Oman, accumulation to the Oil Fund is made on the basis of the market value of 15,000 barrels per day of oil. Oman currently produces about 800,000 barrels per day, a similar level to Trinidad and Tobago on a barrel of oil equivalent (boe) basis. If T&T allocates 2.5% of total production (about 20,000 boe/d) to the Heritage objective, the annual accumulation will be over

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US\$ 400 million at an oil price of US\$ 60/bbl. Under the current rules of accrual, it is unclear how much goes into Heritage and how much goes into Stabilization.

Several other weaknesses may be identified in the current rules of accrual. Firstly, the mechanism for estimating revenue leaves room for easy manipulation. The length of the forecast period induces speculation- the longer the forecast period, the greater the uncertainty. In the circumstances, a Government wanting to increase access to revenue would go for the most optimistic forecasts so that it could generate a high price on which to base its expenditure. Since savings occur only if actual revenue exceeds projected, the authorities wishing to give preference to shorter term objectives may easily eliminate mandatory saving. In some countries- e.g. Norway, all oil revenue goes into the Fund and Government is allowed to withdraw a limited amount to meet well defined and circumscribed budget deficits. In Kuwait, the Government is mandated to transfer 10% of all oil revenue into the Reserve Fund for Future Generations. The issue of price determination could also be very tricky. While international benchmark crude oil prices are readily accessible, the same cannot be said about gas. Indeed, there is still no international market price for natural gas. Moreover, gas is sold to different markets and each carries its own pricing mechanism. These issues impact directly on the question of transparency.

There is a clear need for a tighter, more objective set of rules to determine the rate of accrual. Some elements of an alternative regime should include a reduction in the forecast period to five years rather than eleven. A clear, transparent mechanism should be instituted for estimating the applicable price of natural gas to be used in the revenue forecast, and a minimum level of contribution should be set, perhaps as a percentage of total income.

If accruals happen as a residual, withdrawals have the potential to completely eliminate the Heritage portion of the Fund. The legislation has established strict guidelines for the annual withdrawal from the Fund. However, successive years of low commodity prices could result in a complete depletion of the Fund to a floor of only US\$ 1 billion. The existing rules of withdrawal permit the Minister to withdraw the lesser of 60 % of his shortfall in revenues or 25 % of the balance of the entire Fund, in order to make up a revenue shortfall. For example, assuming we had a current balance in the Fund of US\$ 22 billion and we faced a sustained period of falling prices and less than expected revenues, this balance would be cut to less than US\$ 5 billion within five years and under US\$ 1 billion in ten years. In short, the Bill allows the current generation to consume the wealth of future generations within a short ten year period. The problem is that the current rules apply well to Stabilization but are flawed with respect to fulfilling the Heritage objective. The two purposes are mutually exclusive and therefore cannot be governed by the same rules. Indeed, in the medium term there should be NO withdrawals from the Heritage portion of the Fund. Several alternatives are available. One example is the highly rated Alaska Permanent Fund, which prohibits the withdrawal of principal from the Fund without a full referendum of the Alaskan citizens. The Fund also has a dividend programme, which in 2003 paid each citizen the sum of US \$1,963. The current provision in the legislation dealing with the Heritage aspect of the Fund is deficient. It would be in the nation's best interest to make amendments now. The legislated five year revision horizon is simply too long.

The withdrawal rules also seem to give the Government a free hand to withdraw within the statutory limits without linkage to any fiscal rules. A Government that elects to pursue an

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expansionist path may run too high a fiscal deficit and then seek to finance it from the HSF. For this reason, there seems to be a need for additional withdrawal rules that force Government to at least seek parliamentary approval and/or place a limit on the size of the deficit to be financed.

Finally, there are a few questions related to the operations, management and governance of the Fund. While it is comforting to know that the Central Bank is by law the designated Fund Manager, there seems to be concern about the composition of the Board of Governors. Shouldn't this Board have at least one representative of civil society to guard the interest of the people? The presence of representatives of the Ministry of Finance and the Central Bank on the Board begs the question of whether the current membership can be considered to be independent of the direct influence of the Government.

The HSF Act also seems to be wanting with respect to the reporting obligations. The Act provides for the Board to provide reports on Fund performance on a quarterly and annual basis. It is also obligated to respond to any Ministerial requests for a special report at any time. The audited financial statements of the Fund must be laid in Parliament within four months of the close of the financial year.

By virtue of the provisions in the Act, there is no obligation to report to the people on the people's money apart from the audited financial statements being laid in Parliament once annually. We would expect the Central Bank, as Fund Manager, to meet its statutory obligations as it has throughout its 40-plus year history. But is this sufficient? In the interest of transparency, is it not logical that the Board voluntarily make relevant information easily accessible to the general public on an ongoing basis? After a full year under the Act and nine years since the initial deposits into the then Stabilization Fund, the public still has no knowledge of the distribution of the Fund's investment portfolio, or of its interest earnings. The Act provides for excess revenues to be deposited into the Fund on a quarterly basis. Yet, in a fiscal year in which the actual price of oil is nearly double that of the budgeted price, there has been no disclosure concerning the amount of money deposited into the Fund over the last three quarters. There is sufficient evidence of best practice in the management of sovereign wealth funds to inform the Board of what is an acceptable level of public disclosure. Internet technology and mass media provide limitless avenues for the dissemination of information. In that context, the absence of timely information from the Board of the HSF is unsatisfactory at best. Table 2 provides a summary of the key elements of NRFs in selected countries.

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## 6. CONCLUSION

Natural Resource Funds provide countries with a meaningful way to absorb shocks, both positive and negative, in resource prices. They also assist in allocating some of the income, earned from the depletion of resources today, for future generations. Another important benefit of NRFs is that they provide a mechanism for using resource rents to provide public investments and citizen dividends.

But it has not been all good news. NRFs have failed to meet the specified objectives in several countries. Problems range from lack of transparency and weak Fund management guidelines to flagrant corruption and gross mismanagement of funds.

NRFs are not sufficient solutions to the development challenge of countries that are natural resource dependent. However, they do provide some intermediary relief in times of falling resource prices and also address the key issues of intra and inter generational equity. In essence, if the Fund is to be effective, it must be accompanied by strong fiscal and macro-economic policies by the government, which would lead to a more efficient and effective use of resources and revenue derived from these resources. This would not only lead to great equity within this generation and future generations, but also facilitate the overall long term growth and transformation of the economy.

**Table 2: Natural Resource Funds (Selected Countries)**

| Country/State    | Name                                | Objective/<br>Date Established       | Rules for Accumulation                                      | Rules for Withdrawals   | Management  |
|------------------|-------------------------------------|--------------------------------------|---|---|---|
| Alberta (Canada) | Alberta Heritage and Saving Funds.  | Savings/1976                         | 30% of Resources until 1983, from 1984 –1987 15%            | Discretionary transfers to the Budget   | APFC, Members of Parliament and Provincial Treasurer              |
| Alaska (USA)     | Alaska Permanent Fund               | Savings/1976                         | 50% of certain mineral revenues (increase from 25% in 1980) | Principal Invested permanently. Use of earnings decided by Governor or Legislature. | Independent Trustee, Governor and Legislature                     |
| Chile            | Copper Stabilization Fund           | Stabilization/1985 activated in 1987 | Based on Gov't set reference price                          | Determined by the reference price set.  | Ministry of Finance and Central Bank                              |
| Kuwait RFFG      | Reserve Fund for Future Generations | Savings/1976                         | 10% of all Gov't Revenue                                    | Discretionary transfers to the Budget with approval                                 | Minister of Finance, Central Bank Governor and other officials    |
| Kiribati         | Revenue Equalization Reserve Fund   | Stabilization & Savings/1954         | 25% of all phosphate revenue                                | Discretionary transfers to Budget with approval                                     | Minister of Finance, Secretary of the Cabinet and other officials |
| Norway           | State Petroleum Fund                | Savings/1990 activated in 1995       | Net Gov't Oil Revenue                                       | Transfers to the Budget to finance non-oil deficit with approval                    | Ministry of Finance & Central Bank                                |
| Oman SGRF        | State General Reserve Fund          | Savings/1980                         | Since 1998, oil revenue in excess of budgeted               | Discretionary transfers to the budget   | Autonomous gov't agency   |
| Oman OF          | Oil Fund                            | Oil Sector Investment/1993           | Since 1998 market value of 15000 barrels per day            | Na  | Ministry of Finance   |
| Venezuela        | Macro Resources Stabilization Fund  | Stabilization/1998                   | Since 1999, 50% of all revenue above reference value        | Transfers to budget based on the reference value set                                | Parliament and Executive  |

Source: (Table 1) Jeffrey Davis, Rolanda Ossowski, Annalisa Fedelino (ed.) 2003, IMF Publication, ch 11, pp282-3Selected

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**A SUSTAINABLE DEVELOPMENT PLANNING  
FRAMEWORK FOR MEGA-PROJECTS IN SMALL PLACES**

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**DENNIS PANTIN**



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## 1. INTRODUCTION<sup>22</sup>

In the context of public concerns on the feasibility and desirability of establishing aluminum smelters in T&T, the Sustainable Development Network (SDN) initiated a series of internal discussions among members in 2007. The main conclusion of these meetings was that one ought not to begin with the specifics of aluminum smelters per se but with a **Planning Framework for Mega-projects in small places (such as Trinidad and Tobago)**. This conclusion is reinforced by the fact that the aluminum smelters are, in fact, among a range of major projects which have either already been completed, are currently underway or are on the drawing board in Trinidad and Tobago. Appex 1, for example, provides a copy of a recent statement by Mr. Victor Hart of the Trinidad and Tobago Transparency Institute (TTTI) which identifies a range of such projects and also the concerns raised.

This paper shares, inter alia, some of the thoughts emerging from these SDN meetings - in particular the economic analysis together with more recent analysis. Section 1 begins with a definition of mega-projects in small places and sustainable development. Section 2 addresses the key elements of a planning framework for SD in relation to mega-projects in small places. Section 3 describes the methodology required for implementation of such a planning framework. Section 4 applies the framework and methodology to the case of aluminum smelters. Section 5 reviews a seminal doctoral thesis which addressed the problem of mega projects globally (although not in a 'small place' context) in terms of problems, causes and cures (Flyvberg 2007<sup>23</sup>). Finally, Section 6 sums up the issue and makes some specific proposals in the Trinidad and Tobago context.

## 2. DEFINITION OF MEGA-PROJECTS IN SMALL PLACES

A mega-project can be defined as a particular investment which will have a significant national impact in terms of the economy, society and environment:

**Economic impacts** would include contributions to national employment, livelihoods/poverty eradication/equity, foreign exchange/government revenue, deepening of knowledge and linkages across economic sectors, and gross capital formation;

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<sup>22</sup> Based on an initial policy brief prepared by Dennis Pantin, Justin Ram, Sonja Teelucksingh and Marlene Attzs and with comments of Angela Cropper and Claremont Kirton acknowledged

<sup>23</sup> Flyvbjerg, Bent: Mega Project Policy and Planning: Problems, Causes, Cures

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**Environmental impacts** would address negative or positive changes in eco-system goods and services, human and environmental health impacts, and waste absorption capacity;

**Social impacts** would cover negative or positive changes in heritage or other cultural assets, norms and behaviour and impacts on communities.

## 2.1 Definition of Sustainable Development (SD)

**SD** is not simply, solely or even necessarily, primarily concerned with environmental conservation and management as widely believed. **SD**, rather, is about equity, which may be defined simply as fairness: accepting that everyone ought to have the same life chances as you would like for yourself. Equity in the **SD** sense, therefore, means economic, social and environmental equity both within (intra) and between (inter) generations. Sustainable Development also includes considerations of the continuing viability of enterprises, the capacity of the natural resource base and ecosystems to sustain their services to the economy and society, and the capacity of the environment (air, ocean and rivers, land) to absorb wastes. Over time the Sustainable Development framework has also come to include procedural issues that are deemed important dimensions of the democratic process: participation, consultation, transparency, accountability, and public right to information.

## 3. KEY ELEMENTS OF A SD PLANNING FRAMEWORK FOR MEGA-PROJECTS IN SMALL PLACES

There are two key elements required of a SD Planning Framework:

- **A National Philosophy**

This overarching statement would include a **Vision and Social, Economic and Environmental Objectives** located within the regional context of Caribbean Community and global changes (including in climate). From the holistic perspective of **SD**, one begins with the articulation of a philosophy and a Vision for equitable living (not merely in 2020 but also 2050!). **Social, Economic and Environmental Objectives** would flow out of such a philosophy and vision which cannot be commissioned from one man or even a group, but rather should evolve through an iterative process involving the society as a whole.

- **A Decision Making Framework for All Projects**

This framework ought to contain three main components:

- **A National Environmental Policy (including the precautionary and irreversibility principles).**

- Given our small island reality, national environmental policy must take centrally into account the irreversibility principle: meaning simply that if we make an error, there will be little or no room for correction. The nuclear accident in Chernobyl,

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Ukraine (part of the USSR at the time) affected a geographic area, for example, several times the size of Trinidad! The Bhopal accident in India also affected a large land area. The questions we must ask of mega-projects ought to include, therefore, the geographic and population impacts of any accident, regardless of how low the risk factor may be.

- **A National Physical Plan**, which would use the Visioning process to outline scenarios for the natural and built landscape in 2050 and work backwards to the present in terms of the implications for land use planning today.
- **A National SD Plan including aggregation of all projects in terms of scale, scope and time** for, say, the coming five years and informed by the economic, social and environmental equity objectives to 2020/2050. The plan should also have a degree of flexibility and be continuously re-evaluated at a National scale to ensure that changing National priorities are always incorporated into the National SD plan. This will ensure that the social objectives of each generation are always achieved.

#### **4. METHODOLOGY FOR DECISION-MAKING IN TERMS OF IMPLEMENTATION OF PLANNING FRAMEWORK FOR MEGA-PROJECTS IN SMALL PLACES**

An articulated national philosophy, vision and objectives - realised through a broad-based, non-partisan participatory process – would then facilitate preparation of a National Environmental Policy and National Physical and Sustainable Development Plans. It is within this framework and context that one can now turn to a methodology for decision-making in terms of specific mega-projects in small places.

The most appropriate initial methodological step would be a Cost Benefit Analysis (CBA). CBA, simply defined, requires that no investment be undertaken unless one compares ALL the costs and benefits for the project's life-time. The common sense logic of CBA is that no one should invest good money in a project if **ALL** its costs over its lifetime will be greater than the benefits: i.e. its Benefit Cost Ratio (BCR) is negative. CBA is more than just financial analysis, which only examines the financial returns to a project. CBA, along with the financial returns, also estimates the social and environmental returns of the project overtime. For example, while a project might provide financial benefits, the social and environmental costs may be so high that the project should be abandoned or re-designed. On the other hand, a state sponsored programme (say for public transport) may not be financially viable but may be socially, economically and environmentally viable in terms of additional social and economic benefits such as productivity improvements and reduction in traffic congestion and air pollution.

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## 4.1 Benefit Cost Ratios of alternative projects

In a national planning framework, the question of alternative, comparable projects also needs to be undertaken – as a second methodological step - given the opportunity cost of a specific project decision which encompasses the alternative uses given up (foregone) as a result: in terms of the raw materials which the project will demand, or the actual physical space it would occupy, and/or the financial or human capital employed. The methodology for decision-making for mega-projects in small places to realize SD, therefore, also requires that alternative projects be compared in terms of their relative Benefit Cost Ratios. Step 3 would be Comparative Risk Analysis (CRA).

Finally, the empirical results need to be processed through the filter of human judgement: **Why?** First, the projected benefits and costs cannot be based on assumptions – about future costs and revenues - which may be vitiated by future, actual outcomes<sup>24</sup>. Second, there is an unavoidable element of societal values and philosophy which need to be factored into the final decision-making. A project may have a positive Benefit Cost Ratio but be rejected – perhaps, in favour of a lower BCR project (or completely) - on the grounds that it disserves national values or philosophy (e.g. a major tourist project which is likely to radically change the values of the host community). Alternatively, a project may have a negative CBA or lower CBA than alternative projects (competing for the same land space, raw materials and human and financial capital), but be accepted on the grounds of national interest. However, in instances where judgement is contradicting the empirical results, the qualitative factors being advanced in support must be very strong. The importance of the economic analysis is that it puts the ultimate exercise of judgement on a sounder empirical footing than one's 'feelings' about a project.

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<sup>24</sup> e.g. the 1970's completed feasibility studies for the Pt. Lisas projects all projected rates of return which were grossly exaggerated when compared with actual outcomes in the 1980s, despite the fact that the 'best and the brightest' consultancy firms were employed to undertake such studies.

**Table 1: Summary of Methodology for Decision-Making for Mega-Projects**

|                                 |                                       |  |
|---------------------------------|---------------------------------------|--|
| <i>Estimated Gross Benefits</i> | <i>(Less) Estimated Gross Costs</i> → | <i>(Equals) Net Benefits: i.e. Gross Benefits less Gross Costs</i> → |
| Economic                        | Economic                              | Economic   |
| Social                          | Social                                | Social   |
| Environmental                   | Environmental                         | Environmental  |
| Total                           | Total                                 | Total: followed by Qualitative analysis and exercise of judgement.   |

**Table 2: Template for comparing net benefits of a mega-project and its alternatives**

| <b>SOCIAL Benefits of Project Alternatives 1-3</b>  | <b>ECONOMIC Benefits of Project Alternatives 1-3</b>  | <b>ENVIRONMENTAL Benefits of Project Alternatives 1-3</b>   |
|---|---|---|
| 1. Human Resource Development   | 1. Decent Jobs at community and national level: Temporary and Permanent   | 1. Protection of eco-system services in situ (flora, fauna, etc) and/or no net loss policy.   |
| 2. Allocation of Government earnings from project to Social needs: community specific and national. | 2. Capture of economic rents from maximization of value added from natural resources;<br>3. Net Government Revenue contribution in terms of both Tax and profit income.<br>4. Net Foreign Exchange Earnings;<br>5. Allocation of Government Investment and Recurrent Expenditure from earnings to economic needs: community specific and national | 2. Exploitation of non-renewable resources (taking into account national security of supply: particularly energy);<br>3. Sustainable use of Renewable Resources;<br>4. Allocation of Government Investment and Recurrent Expenditure from earnings to environmental needs: community specific and national. |
| <b>SOCIAL COSTS</b>   | <b>ECONOMIC COSTS</b>   | <b>ENVIRONMENTAL COSTS</b>  |
| 1. Loss of traditional livelihoods; Aesthetics; community; Homes →                                  | 1. Investment Costs<br>2, Value of the Social and Environmental Costs   | 1. Loss of Biodiversity, Aesthetics, Human health impacts, global ecological footprint impact.  |

**5. A SUMMARY ILLUSTRATIVE APPLICATION OF THE PLANNING FRAMEWORK AND METHODOLOGY FOR SD IN SMALL PLACES TO THE PROPOSED ALUMINUM SMELTERS IN TRINIDAD AND TOBAGO**

|   |  |
|---|--|
| <b>National Philosophy, Vision, and Objectives to 2020,2050-3000</b>  | Closest that exists is Vision 2020 but 99.999 % of society uninvolved in its preparation and unaware of its contents. Unclear whether alternative scenarios sketched to 2020 and certainly no Vision for 2050.   |
| <b>National Environmental Policy</b>  | Exists but not clear as to identification and weight placed on the irreversibility principle for small places  |
| <b>National Physical Plan</b>   | Exists but massively out of date: last such plan passed in Parliament in <b>1984!</b>  |
| <b>National SD Plan for coming five years aggregating projects and their impacts</b>  | If prepared not shared with the public   |
| <b>Cost Benefit analysis of each smelter</b>  | Public and ultimate shareholders in gas resources unaware of gas price negotiated by our delegated representatives: i.e. the Government as well as several other elements of costs (particularly social and environmental) together with benefits (including taxation arrangements). |
| <b>Cost Benefit Analysis of identified alternative uses of the natural gas, physical land space and human and financial resources</b> | No evidence that alternative uses of gas or of La Brea site explored and/or alternative sites for the smelters: e.g. Westmoorings or Gulf View. Or alternative of investment in smelting in Guyana and processing of products in T&T.  |

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## 6. MEGA-PROJECT POLICY AND PLANNING: PROBLEMS, CAUSES AND CURES: LESSONS FROM AN INTERNATIONAL REVIEW<sup>25</sup>

As noted earlier, this Section highlights the key findings of a recent doctoral thesis by Flyvbjerg (2007) on the topic. This research established a sample of 258 transportation infrastructure projects, worth US\$90 billion (in 1995 prices), where there was available data on both actual construction costs and estimated costs at the time of the decision to initiate building. These projects were located in 20 countries in five continents, including both developed and developing countries, and these projects were completed between 1927 and 1998. Flyvbjerg's findings were that the average cost overrun was some 45% for rail infrastructure projects, 34% for bridges and tunnels, and 20% for road construction.

### 6.1 Cost Overruns

His summary findings are that over this large quantity of 258 projects in 20 countries (both developed and developing) in five continents between 1927 and 1998:

- 9 out of 10 projects had cost overruns;
- Overruns were consistent across all 20 countries and five continents covered by the study;
- Overruns were constant for the 70-year period covered by the study. In other words, estimates of anticipated costs had not improved over this long time period.
- Finally, it was concluded based on comparative studies that: " *The available evidence suggests that cost overruns and benefit shortfalls are neither larger nor smaller for transportation infrastructure than for other project types, including power plants, dams, water projects, concert halls, museums, sports arenas, convention centers, IT systems, oil and gas extraction projects, aerospace projects, and weapons systems..... The data also indicate that cost overrun for other projects have neither increased nor decreased historically and that overrun is common to both First- and Third-World countries as is the case for transportation infrastructure.*" (Flyvbjerg, 2007:5, 36. author's emphasis).

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<sup>25</sup> A number of other papers on mega-projects are listed in the Bibliography. However, Flyvbjerg's is highlighted given its range and depth

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## 6.2 Benefit shortfalls

In terms of benefits, Flyvbjerg found that the inaccuracy of travel demand forecasts for rail was 51% lower, on average, in terms of passenger traffic forecasted to justify the project. The over-estimate for roads was significantly lower, at 10% on average. More detailed findings were that:

- “84% of rail passenger forecasts are wrong by more than 20%;
- 9 out of 10 rail projects have overestimated traffic;
- 50% of road traffic forecasts are wrong by more than 20%;
- Inaccuracy is constant for the 30 year period covered by the study (for travel projects) and (therefore) forecasts have not improved over time;
- Such inaccuracy in traffic forecasts is found in the 14 nations and 5 continents covered by the study.” (Flyvbjerg, 2007:14)

## 6.3 Why Cost Overruns/Benefit shortfalls Important?

Flyvbjerg goes on to point out four key reasons why cost overruns and benefit shortfalls are a problem:

- “They lead to a Pareto-inefficient allocation of resources: i.e. waste;
- They lead to delays and further cost overruns and benefit shortfalls;
- They destabilize policy, planning, implementation and operations of projects;
- The problem is getting bigger, because projects get bigger.”(Flyvbjerg, 2007:16).

## 6.4 Causes and Recommended Solutions

Flyvbjerg identified three main explanations for cost overruns and benefit shortfalls in the literature, which he then tested based on his sample and the work of others.

### 6.4.1 Technical Explanations

The first explanation is that technical factors are the causes “*in terms of unreliable or outdated data, the use of inappropriate forecasting models, honest mistakes, lack of experience on the part of forecasters, etc.*”(Flyvbjerg, 18) This, he points out, is the most common explanation found in the literature with the natural, logical and recommended solution being the need to develop better forecasting models, better data and more experienced forecasters. However, Flyvbjerg rejects this technical explanation based on his large sample. He indicates that the statistical analysis does not support this explanation, noting, in summary, that “*For technical explanations to be valid they would have to explain why forecasts are so consistent in ignoring cost and benefit risks over time, location and project type.*” (Flyvbjerg, 20).

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## 6.4.2 Psychological Explanations

Psychological explanations were found to “*better fit the data*” in terms of what is termed ‘*optimism bias*’ on the part of planners and promoters of mega-projects. However, Flyvbjerg expresses skepticism on the validity of this psychological explanation on two grounds. First, when examined, actual forecasts do not mention optimism bias as a main cause of inaccuracy in forecasts. Moreover, and more importantly, Flyvbjerg points out that:

*“.. ...it seems unlikely that a whole profession of forecasting experts would continue to make the same mistakes decade after decade instead of learning from their actions. Learning would result in the reduction, if not elimination of optimism bias, which would then result in estimates becoming more accurate over time. But the data clearly show that this has not happened. The profession of forecasters would indeed have to be an optimistic – and non-professional group - to keep their optimism bias throughout the 70 year period the study covers for costs, and the 30-year period covered for demand, and not learn that they were deceiving themselves and others by underestimating costs and over estimated benefits.....Therefore, we are led to reject optimism as a primary cause of costs underestimation and benefit overestimation.”* Flyvbjerg, 21)

## 6.4.3 Political-economic explanations

It is the third explanation (political-economic) which Flyvbjerg finds, together with what he terms ‘*strategic misrepresentation*’, which accounts for cost overruns and benefits overestimation. He draws on two studies, which involved interviews with forecasters in the United Kingdom and the United States respectively. The essential findings were that public employees were pressured to adjust costs and benefits to make projects look feasible, while there was also a tendency for private consultants to provide the advice which those paying them wished to hear. The UK study undertaken by Flyvbjerg himself and someone by the name of Cowi (Flyvbjerg and Cowi, 2004) interviewed public officials, planners and consultants involved in the development of large UK transport infrastructure projects. They quote a planner with a local transport authority as providing a typical response of interviewees: “*You will often as a planner know the real costs. You know that the budget is too low but it is difficult to pass such a message to the counselors (politicians) and the private actors. They know that high costs reduce the chance of national funding.*” Flyvbjerg, 22)

Flyvbjerg also cites similar studies in the USA by Martin Wachs (1986, 1990) which came to similar conclusions based on interviews with planners: “*In case after case, planners, engineers and economists told Wachs that they had had to ‘revise’ their forecasts many times because they failed to satisfy their superiors.*

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*The forecasts had to be cooked in order to produce numbers that were dramatic enough to gain federal support for the projects whether or not they could be fully justified on technical grounds.” (Flyvbjerg, 23)*

The problem of leverage exercised by their ‘bosses’ in the case of publicly employed forecasters is not mitigated necessarily by the use of private consultants. Flyvbjerg found, on this score, that: *“Specialized private consultancy companies are typically engaged to help develop project proposals. In general, the interviewees (public employees) found that consultants showed high professional standard and integrity. But interviewees also found that consultants appeared to focus on justifying projects rather than critically scrutinizing them. A project manager explained: ‘ Most decent consultants will write off obviously bad projects but there is a grey zone and I think many consultants in reality have an incentive to try to prolong the life of projects which means to get them through the business case. It is in line with their need to make a profit.’ (Flyvbjerg, 23, author’s emphasis).*

He also cites Wachs, who also spoke specifically with consultants in the USA study and who cites one such consultant as frankly stating: *“success in the consulting business requires the forecasters to adjust results to conform with the wishes of the client.” (Flyvbjerg, 24).*

In summary, Flyvbjerg’s analysis led him to the conclusion that psychological explanatory factors have *“...a relative merit in situations where political and organizational pressures are absent or low..... Conversely, political economic explanations..have their relative merit where political and organizational pressures are high - this being common for large, high-profile public projects with many and powerful stakeholders...” (Flyvbjerg, 25)*

#### **6.4.4 Solutions**

Flyvbjerg concludes by defining the need for reform in mega-project policy and planning, beginning with the need to distinguish between two fundamentally distinct situations. The first situation would be where planners and promoters are genuinely interested in getting forecasts right. The second situation would arise where they do not because optimistic forecasts are seen as necessary to have a project implemented.

In terms of the first situation, the reform is relatively straight-forward and focused on improving forecasting methodology. However, the second situation is more problematic, and Flyvbjerg identifies the key reforms to involve incentives *“...to reward honesty and punish deception, where today’s incentives often do the opposite.”(Flyvbjerg, 27).*

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### 6.4.5 Reference Class Forecasting Methodology

Flyvbjerg proposes the use of a ‘reference class forecasting’ methodology to improve the quality of projected costs and benefits of projects. This methodology essentially involves using an ‘outside view’ approach to forecasting which is based on information from a class of similar projects: “*The outside view does not try to forecast the specific uncertain events that will affect the particular project, but instead places the project in a statistical distribution of outcomes from this class of reference projects (involving the following three steps):*”

- *Identification of a relevant reference class of past projects. The class must be broad enough to be statistically meaningful but narrow enough to be truly comparable with the specific project;*
- *Establishing a probability distribution for the selected reference class. This requires access to credible, empirical data for a sufficient number of projects within the reference class to make statistically meaningful conclusions;*
- *Comparing the specific project with the reference class distribution, in order to establish the most likely outcome for the specific project.”* (Flyvbjerg, 28-29)

Flyvbjerg cites, as an example of the outside view, a curriculum planning project where ‘inside’ participants’ estimate conclusion within 18-30 months, while the outside view was 7-10 years. In reality, this particular project was completed 8 years later “*with the efforts largely wasted (since) the resulting curriculum was rarely used.*” (Flyvbjerg, 29).

### 6.4.6 Public and Private Sector Accountability

Flyvbjerg identifies Accountability as central to the reform in the second instance where ‘*planners are part of the problem, not the solution*’ in that there is no interest in getting forecasts right, but instead the focus is on having projects approved. He points out that “*The key weapons in the war on deception and waste is accountability and critical questioning.*” (Flyvbjerg, 37). He then advances the following specific reforms to implement these ‘key weapons’:

- “*Forecasts should be made subject to independent peer review. Where large amounts of taxpayers’ money are at stake, such review may be carried out by national or state accounting and auditing offices, ... Other types of independent review bodies may be established, for instance, within national departments of finance or with relevant professional bodies;*”

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- *Scientific and professional conferences should be organised where forecasters would present and defend their forecasts in the face of colleagues' scrutiny and criticism;*
  - *Forecasts should be benchmarked against comparable forecasts, for instance using reference class forecasting;*
  - *Forecasts, peer reviews and benchmarking should be made available to the public as they are produced, including all relevant documentation;*
  - *Projects with inflated benefit-cost ratios should be reconsidered and stopped if recalculated costs and benefits do not warrant implementation.*
  - *Professional and occasionally even criminal penalties should be enforced for planners and forecasters who consistently and foreseeably produce deceptive forecasts. Malpractice in planning should be taken as seriously as it is in other professions. Failing to do this amounts to not taking the profession of planning seriously.*
  - *The decision to go ahead with a project should, where at all possible, be made contingent on the willingness of private financiers to participate without a sovereign guarantee for at least one third of the total capital costs;*
  - *Full public financing of full financing with a sovereign guarantee should be avoided;*
  - *Forecasters and their organisations should share financial responsibility for covering cost overruns and benefit shortfalls resulting from misrepresentation and bias in forecasting;*
  - *Whether projects are public, private or public-private, they should be vested in one and only one project organisation with a strong governance framework....What is important is that this organization enforces accountability vis-à-vis contractors, operators, etc. and that, in turn, the directors... are held accountable for any cost overruns, benefits shortfall, faulty designs, unmitigated risks, etc. that may occur during project planning, implementation and operations.” (Flyvbjerg, 2007, 33-35).*

## 7. CONCLUSIONS AND RECOMMENDATIONS

The reforms proposed by Flyvbjerg (2007) are light years ahead of the reality of mega-project planning and implementation in Trinidad and Tobago. This reinforces the clear deficiencies in the planning and implementation framework for mega-projects in Trinidad and Tobago discussed in the earlier Sections of this Report. Perhaps the central deficiency is in the governance arrangements. As noted at the onset of this paper: *“Over time, the Sustainable Development framework has also come to include procedural issues that are deemed important dimensions of the democratic process: participation, consultation, transparency, accountability, and public right to information.”*

The main recommendation being advanced, therefore, is for a halt to be placed on the implementation of new mega-projects in T&T until such time as there can be a full national conversation on the lessons of the global experience as described by Flyvbjerg (2007) and the implications addressed in terms of actual reforms to the process. This recommendation is one

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which is unlikely to find favour with the powers that be. It will therefore be left to the will of civil society to give effect to this recommendation.

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## APPEX 1

### MEGA-PROJECTS: ARE THEY IN THE CITIZENS’ INTEREST?

March 26, 2007, at the Oilfields Workers’ Trade Union headquarters.

**Mega-projects – the implementation process by Victor Hart, Vice-Chairman, Trinidad and Tobago Transparency Institute.**

#### Introduction

The Trinidad and Tobago Transparency Institute (TTTI) welcomes the opportunity to be part of this Public Policy Forum on Mega-projects and to share with participants our views on one aspect of the subject. I say ‘one aspect’ because there are many dimensions to the subject viz economic, sociological, environmental, technical (in terms of the procurement of planning, design and construction services) and process. Our contribution will deal with the project implementation process and start from the premise that, given the economic circumstances in which T&T finds itself and government’s 20/20 Vision objectives, some mega-projects are unavoidable. Having accepted that premise, TTTI wishes to address only those aspects of the implementation process that impact on successful delivery. We will leave to others the task of discussing the technical arguments of whether or not mega-projects are in the citizens’ interest.

As you may know, TTTI is the local chapter of Transparency International. Our Vision is that of a world in which government, politics, business, civil society and the daily lives of people are free of corruption. Our Mission is to work towards a country and region that are free of corruption, which we define as ‘the abuse of entrusted power for private gain’. As an organization, our primary focus is on issues of transparency and accountability with the aim of avoiding or minimizing corruption. Therefore, our interest in mega-projects is in the process of implementation rather than in the technical merits.

#### Project implementation

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TTTI would like to see government adopt an approach to project implementation that is built around the principles of *Value for Money, Transparency and Accountability*. Interestingly, these principles are not TTTI's but government's own declared policy as was stated by Prime Minister Manning when he tabled in Parliament in September 2005 the White Paper on the Reform of the Public Procurement Regime. He promised then that the new policy would become law within twelve months but, today, 18 months later the draft legislation has not yet been published for public comment. This means that the process of getting the Draft Bill on the Parliamentary Agenda for debate in both houses, examination in committees, final passage and presentation for presidential assent has not yet started. With national elections just around the corner, there is the distinct probability that the legislation might not be taken through its various stages before Parliament is prorogued. Therefore, in the implementation of its mega-projects, government is not only ignoring its own declared new procurement policies but is slow in passing legislation that would protect the public's interest. Since government has not satisfactorily explained the delay, the public is left to speculate and draw their own conclusions. This is so serious a concern that, at the end of this presentation, TTTI will call on this forum to make its voice heard on this matter.

### **Value for Money**

Mega-projects by their very nature cost a lot of money and it is imperative, therefore, that the country gets value for the money spent. Value for money means not only a product that satisfies the project brief and citizens' expectations but also a project that is not expensive to operate and maintain and the country benefits from a residual cadre of professionals and technicians with enhanced capabilities as a result of transfer of technology, where appropriate.

The essential ingredients for achieving value for money on mega-projects are:

- At the planning stage: a competently prepared project feasibility and brief including budget.
- At the implementation stage: competent project oversight, preferably by local personnel.
- After completion: competent facility and maintenance management, preferably by locals.

As a country, we have repeatedly fallen short in all these areas because of nepotism in the choice of consultants and managers with resultant poorly conceived projects, poor project management and wastage of public funds. Also, our governments have been guilty of a cavalier approach to spending the people's money that is totally unacceptable and for which they are not made to account. Such an approach on mega-projects could result in mega -bucks going down the proverbial drain and it is about time that civil society reminds government that the money being wasted is ours not theirs and that 'enough is enough'.

A current example of government's poor financial planning and management on a mega-project is the proposed Rapid Rail System. Government has committed the country to a massive investment (estimated initially to be 20, then 15, then 10 and now 7 billion dollars and counting)

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without the benefit of a specific Financial Feasibility Study that shows that Rapid Rail is the most cost-effective option available to us. A prudent approach to project implementation requires that, after a technical feasibility study ranks options in order of preference, a specific financial feasibility study is done on the top ranked options to determine which solution offers the best value for money. After such a study, the technical solution initially ranked first might or might not be shown to offer the best value for money and, if not, it might be replaced by the solution initially ranked second or third. In the case of the Rapid Rail project, no such study was done to inform the implementation decision. What is very worrying to TTTI about government's approach is that the Honourable Colm Imbert, Minister of Works and Transport, is on public record as saying that he saw no need for a specific financial feasibility study. In effect he has said to the country: *we have a traffic problem; Rapid Rail is the answer; so it's full speed ahead; trust us not to spend any more of your money than necessary.*

This approach to what should be responsible management of taxpayer's money is both difficult to understand and impossible for us to accept. It is an unacceptable explanation to taxpayers, whose money is being spent now and for years to come in providing a Rapid Rail System with no real assurance about its eventual cost. Can you imagine Minister Imbert investing his own money in a private development and not undertaking a Financial Feasibility Study to inform his decision on whether or not to proceed? Moreover, his Bankers would insist on seeing such a study. So here it is that \$7Billion of taxpayers money is being committed, in the first instance, to the Rapid Rail project and our system of government allows the Line Minister to say that a Financial Feasibility Study is a waste of time. It is disturbing to note that, in our current system of government, the Executive can commit to such a large and strategically important investment of public money without having to justify its action to the taxpayer through Parliament. It points to a serious weakness in the public financial management system that needs to be addressed.

When the country spends large sums of money on mega-projects, invariably there is participation by foreign consultants and contractors who bring (or so it is claimed) expertise that is not available locally. In such circumstances, as stated earlier, the transfer of technology to locals is an intrinsic benefit and major objective that falls under the heading of 'value for money'. However, in most cases, our government and its special purpose state companies show no interest in pursuing that objective. The country's Work Permits Law requires that a permit be granted to employ a foreigner only under very strict conditions, including the training of a local understudy. This law is observed with more in the breach than in the compliance by both the public servants employed to enforce the law and by employers. The breaches of the Work Permit Law are taking place everyday across the length and breadth of this country with no monitoring to enforce compliance. Part of the problem civil society faces in monitoring compliance is the difficulty of knowing, before its too late, just what is going on behind the scene.

An example of non-compliance on one mega-project on which statistics have been made public is the infamous Piarco Airport Development Project. Evidence offered during the Commission of Enquiry into that project by the then Permanent Secretary of the Ministry of National Security (and Chairman of the Work Permits Advisory Committee) revealed that the contract under which Birk Hillman Consultants was engaged required that '*to the maximum extent possible*' the project should use '*local labour, services and materials.*' Yet, Work Permits were issued to the leading contractors on the projects for 95 foreigners. Most of permits were given to employ Colombians

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and Cubans to lay floor tiles and to build ceilings and drywall partitions, skills that are readily available locally. Those posts for which permits were granted were not advertised locally nor were locals employed as understudies as required by law.

You would have thought that those revelations would have spurred government, generally, and the Ministry of National Security, in particular, to tighten up their act and enforce the Work Permit Law but you would have been wrong. Today, nothing has changed and, if anything, the situation is worse. In addition to the increasing number of foreigners working in the Petrochemical Industry, our government is encouraging the displacement of locals from the general construction industry as the following selected examples show viz:

- Americans architects and engineers are designing the Port of Spain Waterfront Project, the Tarouba Sports Complex and the Linear Itech Park at Wallerfield etc.
- American architects and engineers are project managing the downtown Government Campus and the Scarborough Hospital and are carded to design the new Port of Spain General Hospital.
- British architects and engineers are planning the Wallerfield New Town Development.
- Canadian architects and engineers are designing the Scarborough Hospital and are project managing the Port of Spain Waterfront Project and several other UDeCOTT projects.
- French  
contractors are building the Port of Spain Waterfront Project.
- Chinese architects, engineers and builders are designing and building Cultural Centres all over the country, Government Offices, eTech's offices, the UTT Campus at Wallerfield and the new Prime Minister's residence. Very soon, it is rumoured, houses in Tobago will be added to this list.

Even the private sector is following government's lead. Note the recent announcement that a national Credit Union (who one would expect to be looking after the interest of the small man) has employed the French contractor from the Waterfront Project to build the Broadgate mega-project on South Quay.

From observation, it appears that our government and its agencies are not insisting on any transfer of technology to ensure that the country derives maximum value for money spent on its mega-projects. One is left to wonder why our own government is leading the way to hand over the local construction industry to foreigners. Instead of strengthening the local consulting and contracting organizations by involving them in the mega-projects, government is emasculating the local firms in favour of foreigners who are enriching themselves and will pack their bags and leave our shores on completion of these projects. This at a time when we have two universities producing graduates for the construction industry only to become commodities for the transient foreign firms. We need to question government's adoption of the wholesale use of foreign firms to achieve its development objectives rather than adopting a phased approach to development and the use of local consulting and contracting firms. This latter approach will see a strengthening of the capacity of the local construction industry to meet local needs and even to

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export services to the wider Caribbean. Human resource development is an essential benefit to be derived from mega-projects and, unfortunately, our government does not see this as part of the value for money equation. Indeed, Human Resource Development is a key plank in government's 20/20 Vision aims and objectives to which it appears they are only paying lip service.

Finally, I ask, where is the voice of the nation's Trade Union Movement in protesting the daily breach of the country's Work Permits Law to the disadvantage of the workers whose money is being spent on these mega-projects but are denied their right to share in the opportunity to hone their skills and to benefit from the technology transfer on those projects? Should not the Trade Union Movement be taking issue with government for handing over the local construction industry to foreigners on a platter?

## Transparency

I said earlier that value for money means, among other things, a product that satisfies the project brief and citizens' expectations. That means, of necessity, an input into the design brief of the views of our citizens, generally, and, in particular, the views of citizens who will be directly affected by the project. Such a process calls for public disclosure and transparency on the part of government of its plans and the rationale behind its decision to implement. That requires a major shift by government from its current practice of presenting the public with a *fait accompli* when new projects are announced. Government's track record does not inspire confidence that it is minded to consult with the citizenry in a meaningful way before project implementation decisions are taken. Recently, we have seen government making decisions to implement mega-projects without any advanced public consultation e.g. Port of Spain Waterfront Redevelopment, Tarouba Sports Complex, Aluminum Smelters, Rapid Rail System, Carnival and other Cultural Centers etc. On the other hand, and at the same time, we see government going to great lengths to have public consultations before implementing projects of far less technical complexity and scope, far less cost and of far less significance to the future development of the country e.g. the proposed Princes' Town to Mayaro Highway and the extension of the Solomon Hochoy Highway to Point Fortin, for each of which four public consultations were held in February and March respectively. Further, government is holding five public consultations, during this month, on the proposed Postal Sector Policy. The press announcements for these consultations state the following:

‘The purpose of the consultations is to present the draft Postal Sector Policy and give the public a clear and accurate understanding of the draft Postal Sector Policy document. These sessions will also provide an opportunity for all stakeholders to air their views and add value to the Postal Sector Policy development process’.

But is this not all that TTTI and other stakeholders have been asking government to do in respect of the mega-projects? Obviously, government knows about the principle of consultation but is selective in its application. It begs the question, why no consultation on the mega-projects? Why the lack of transparency on mega-projects? One is left to wonder if there is something to hide.

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## Accountability

Accountability to the taxpayer is an essential part of all public projects especially mega-projects because of the greater economic and social impact they have on the country. Once again, government's track record does not inspire confidence that it recognizes its obligations to account to the people for the large sums of their money that are being spent in the name of development. Not only is the genesis of most mega-projects shrouded in mystery but also the terms and conditions of their implementation. The public's cry for details on the current mega-projects have been falling on deaf ears. The details of many of the projects are hidden behind the high walls erected around the specially created special- purpose State Enterprises that are laws unto themselves and are run by project czars who, in some cases we are told, answer directly to the Prime Minister, without the checks and balances of Central Tenders Board or its equivalent.

The Rapid Rail project is an example of a mega-project, which fails the accountability test. This project is in its infancy but already there are worrying signs about who would be held responsible for the outcome of this project. At the outset, government announced that the National Infrastructure Development Company (NIDCO) was charged with implementing the project. However, NIDCO has been noticeably silent on the matter. Where is NIDCO's voice among the tens of thousands of words being spoken about the project? The only voice being heard is that of Minister Imbert who appears to have assumed the role of Project Manager very reminiscent of what was done by then Minister John Humphrey on the Piarco Airport Project. Government Ministers seem unable to resist the temptation to interfere in the project implementation process.

During his address to the Chamber of Industry and Commerce, on 16<sup>th</sup> January, 2007, Minister Imbert said that 'it was obvious that NIDCO did not have the in-house technical expertise to evaluate the work of the foreign consultants and contractors who might be engaged on the project'. Therefore, he said, NIDCO was hiring the best available foreign consultants to supervise on its behalf the work of the other foreign consultants and contractors and to advise. You may recall that on the Piarco Project, the Airports Authority fired its local technical staff on the very day that tenders were received for evaluation and relied on foreign consultant Birk-Hillman Consultants to advise on the award of contracts and, as they say, the rest is history. Likewise, NIDCO will be managing the Rapid Rail project without any local in-house technical staff to protect the country's interest.

In these circumstances, if the outcome of the project is less than expected and promised, who will be held accountable? Would it be the Minister, or NIDCO, or the foreign consultants whom NIDCO employed to supervise on its behalf (and who would have long since departed from our shores)?

The situation begs the question – who will guard the guards? TTTI suggests that accountability would be greatly improved if NIDCO were to employ local transportation engineers and other

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local technical personnel to oversee the implementation of the Rapid Rail project. Where specialized local expertise might be in short supply, local consultants should be required to hire the necessary foreign expertise under their direction and be the beneficiaries of any transfer of technology, where applicable. This approach, with NIDCO being responsible for the management and client representation and the Minister responsible for policy directives, should make for greater accountability.

## **Close**

In summary, TTTI accepts that some mega-projects will be built and wants to urge government to use a project implementation process that will ensure *Value for Money, Transparency and Accountability*. That process will be guaranteed if government makes the new Procurement Regime law without further delay. In the absence of that legislation, the Rapid Rail project and other current mega-projects have got off to an uncertain and worrying start. If the implementation approach is not revisited, the Rapid Rail project, at best, seems destined to be a partial waste of taxpayer's money, both in terms of capital and maintenance expenditure, without any reasonable assurance that it will solve our traffic problems. At worst, it has the potential to become another Piarco Airport – by being a ‘milch cow’ and ‘a feeding frenzy’- to quote a former Prime Minister. Based on government's current approach, some of the other mega-projects could very well suffer a similar fate. Therefore, TTTI cautions government and the national community that, with the current and proposed mega-projects budgeted to cost several times more than the Piarco Airport Project, we must do better, this time around, by taking the appropriate steps to avoid the wastage and corruption that are the legacies of Piarco Airport, the mega-project of the last decade.

Finally, if this forum shares TTTI's concerns about the potential for mismanagement and corruption posed by the way the mega-projects are being implemented, we invite you to consider and, if found appropriate, pass a resolution demanding of government the enactment of the new procurement legislation before the end of the current parliamentary term.