Capturing Resource Rents
by Analysing the True Economic Value of the Resource and
Factoring Sustainability & Energy Security Concerns –
The Case of Trinidad and Tobago

Accounting for the Petrodollar
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What are Rents?

- Conventional Definition:

- Economic Rents are excess that a factor of production is paid over the amount to keep in its current employment – excess profits
What are rents in Oil and Gas Sector?

- Difference between price of resource and cost of getting resource to the market
- Market Price minus all costs of production
- All costs of production: exploration, development, operating, capital, transportation, allowance for normal rate of return (normal profit)
Rents:

- Rents = Price – all costs

- Rents or excess profits should be collected by government or resource owner (people of Trinidad and Tobago) through oil and gas taxation regime
Efficient rent capture:

- Resource owner needs to know:
  - Correct net price
  - Hotelling Principle: \( P_t = P(0)e^{rt} \)
  - But is the market price the correct price for oil and gas?
  - Costs – difficult to know for certain, companies are guarded over costs
Is the market price the correct value for a small open economy?

- Energy is essential for modern living, it is therefore a valuable component of production, here and abroad.
- Global price does not reflect local scarcity
- Allows for greater value added in the economy.
- If we use resource today we don’t have it for use later on
- Must consider our own energy security and
- Sustainable Development Objectives.
Must ask the following questions:

- What to de we leave for posterity?
- What is our underlying development strategy?
- What is our national philosophy for future generations?
- How do we balance current generation requirements with future generation wants?
To satisfy objectives:

- We need to:
  - For an exporter (producer) like us we need to get highest value for resource
  - Just as an importer (consumer) would like to get resource at lowest value.
  - Need to be compensated for not having resource for use later on: User costs
  - Resource enables domestic economic activity and provides foreign exchange earnings
Economic Value: LNG as an example

- Not market price, but economic value

- What is the value added from use of LNG?
<table>
<thead>
<tr>
<th>Product</th>
<th>Volume (mmcf/d)</th>
<th>Value ($/mmbtu)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Peak Power</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B Household Distribution</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C Methanol</td>
<td></td>
<td></td>
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<tr>
<td>D Fuel Oil</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E Fertilizer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F Steel</td>
<td></td>
<td></td>
</tr>
<tr>
<td>G LNG</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Price Comparisons US$ per million BTU

<table>
<thead>
<tr>
<th>US$/million Btu</th>
<th>1999</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>LNG Japan cif</td>
<td>3.1</td>
<td>4.7</td>
<td>4.6</td>
<td>4.3</td>
<td>4.8</td>
<td>5.2</td>
</tr>
<tr>
<td>Henry Hub USA</td>
<td>2.3</td>
<td>4.2</td>
<td>4.1</td>
<td>3.3</td>
<td>5.6</td>
<td>5.9</td>
</tr>
<tr>
<td>Electricity domestic US</td>
<td>24.0</td>
<td>24.0</td>
<td>25.2</td>
<td>24.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electricity Industrial US</td>
<td>12.9</td>
<td>13.5</td>
<td>14.7</td>
<td>14.1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Using Economic Value as price:

- Economic Value and not financial value is true resource price
- Example: Total value (not net value)
- LNG shipments to USA (2004)
  - Henry Hub: US$2.8 billion
  - Industrial Electricity: US$6.7 billion
  - Residential Electricity: US$11.8 billion
We must also consider User Costs for Posterity (conventional approach)

- Concept of Marginal User Costs (MUC)

- MUC is concerned with the price of the backstop technology

- i.e. Price of energy when resource is no longer available
But there are additional considerations for a small exporting economy

- **Sustainability** – future generations

- **Energy Security** – adequacy of supply to meet requirements

- **Opportunity Cost** – not having inexpensive domestic energy for future economic activity

- **We therefore need a domestic energy policy** – strategy ‘til 2050 – depends on where we see our economy – what will our energy needs be then?
Additional Considerations for small exporting economy:

- Therefore our user costs calculation needs to be modified to reflect our circumstance:

- MUC = also needs to include:
  - SC Sustainability constraint
  - ES Energy Security
  - OC – Opportunity Cost
Example of User Costs from LNG 1, but only with **conventional calculation**

<table>
<thead>
<tr>
<th>Category</th>
<th>Total Present Value US$ (at 10%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investment Costs</td>
<td>706 million</td>
</tr>
<tr>
<td>Operating Costs</td>
<td>357 million</td>
</tr>
<tr>
<td>Cost of Gas</td>
<td>1.9 billion</td>
</tr>
<tr>
<td>Revenue Projections</td>
<td>8.8 billion</td>
</tr>
<tr>
<td>Gas Consumed cf</td>
<td>3.5 trillion</td>
</tr>
<tr>
<td>LNG produced cf</td>
<td>3.1 trillion</td>
</tr>
<tr>
<td>(this includes loss of approx 11%)</td>
<td></td>
</tr>
</tbody>
</table>

*This gives a net back value of gas of US$ 1.39 mmbtu for the project*
Government Revenue

Given Central Bank estimates of government revenue from the project at US$6 billion (which includes NGC’s share in project) and assuming a 10% discount rate this gives a present value of US$2.3 billion.

This gives a net back value of gas to the government of US$ 0.65 mmbtu.
Calculations show that:

- **MUC with LNG is US$1.25 mmbtu**
- **MUC without LNG is US$ 0.64 mmbtu**
- Therefore the user cost attributable to LNG is US$ 0.61 mmbtu
### User Costs with different scenarios

US$/mmbtu

<table>
<thead>
<tr>
<th>Scenario</th>
<th>User Cost with LNG US$</th>
<th>User cost without LNG US$</th>
<th>User Cost attributable to LNG US$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.63</td>
<td>0.092</td>
<td>0.538</td>
</tr>
<tr>
<td>2</td>
<td>1.25</td>
<td>0.64</td>
<td>0.61</td>
</tr>
<tr>
<td>3</td>
<td>0.87</td>
<td>0.52</td>
<td>0.35</td>
</tr>
</tbody>
</table>
User Costs example

- Only shows conventional user Costs (US$.061/mmbtu),

- If Government revenues are: US$.065/mmbtu then this signifies inadequate rent capture and inadequate user cost capture

- We need to also capture other components of user cost for a small open economy

- If calculated, then user costs should be saved or invested for the future.
Rents and User Costs

- User cost is a proportion of rents, therefore rent capture must be efficient and calculated on economic basis.

- If all components (PB, ES, SC, OC) are calculated, then user costs should be saved or invested for the future e.g.:
  - Heritage fund
  - ES component invested in alternative energy and research (carbon neutral)
Conclusions

- Value resource at economic value not market price.
- User Cost for small open petroleum economy is different from conventional.
- We need to calculate and capture these values through royalty and taxation regime.
- Fair trade LNG.
Conclusions

- This is only the beginning of defining a new methodology.
- Further research required.
- Taxation mechanisms must account for all components of user cost.
The End