As Bayu Undan Dries Up: Challenges and Opportunities

Presentation by Charles Scheiner to the Timor-Leste Studies Association
29 June 2017

Petroleum Dependency

(million current US dollars)

<table>
<thead>
<tr>
<th>Year</th>
<th>Petroleum GDP</th>
<th>Non-oil GDP</th>
<th>Productive (agric. &amp; manuf.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>$4,234 (75%)</td>
<td>$1,410 (25%)</td>
<td>$289</td>
</tr>
<tr>
<td>2014</td>
<td>$2,591 (64%)</td>
<td>$1,451 (36%)</td>
<td>$295</td>
</tr>
<tr>
<td>2015</td>
<td>$1,496 (48%)</td>
<td>$1,607 (52%)</td>
<td>$293</td>
</tr>
</tbody>
</table>

- Projected state revenues in 2017: $1,312 million
  - $843 million (64%) will be from investing the Petroleum Fund
  - $263 million (20%) will be from oil and gas revenues
  - $206 million (16%) will be from non-petroleum sources

- 2017 State Budget: $1,387 million
  - $1,079 million (78%) will come from the Petroleum Fund in 2017.
  - $206 million (15%) is from non-petroleum (domestic) revenues
  - $102 million (7%) is from loans which will have to be repaid with interest

- State activities, paid for with oil money, are about half of the “non-oil” economy, because some of this money circulates in the local economy.
- Petroleum “income” goes to the government, not the people.

Only South Sudan, Libya (and Equatorial Guinea?) are more dependent on oil and gas exports than Timor-Leste was.
As Bayu Undan Dries Up

Production now falls faster than prices, and will not go back up. The price will be irrelevant when we have nothing left to sell.

Timor-Leste has already received 98% of the revenue from Bayu-Undan and Kitan, and they will end entirely in 2021.
The Ministry of Finance knows that Bayu-Undan is almost empty.

Table 2.6.3.1: Petroleum Revenues from Bayu-Undan and Kitan 2014-2020 (Sm)

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Total Petroleum Fund Revenue</td>
<td>3,906.7</td>
<td>2,918.5</td>
<td>957.5</td>
<td>872.1</td>
<td>1,106.3</td>
<td>906.7</td>
<td>873.3</td>
<td>710.7</td>
<td>799.3</td>
</tr>
<tr>
<td>Petroleum Fund Investment Return</td>
<td>864.9</td>
<td>501.6</td>
<td>-21.4</td>
<td>648.3</td>
<td>842.9</td>
<td>524.1</td>
<td>788.1</td>
<td>681.6</td>
<td>708.2</td>
</tr>
<tr>
<td>Total Petroleum Revenue</td>
<td>3,041.8</td>
<td>1,817.0</td>
<td>978.9</td>
<td>903.9</td>
<td>1,651.3</td>
<td>1,382</td>
<td>1,255</td>
<td>1,109</td>
<td>1,391</td>
</tr>
<tr>
<td>BU FTP/Royalties</td>
<td>305.9</td>
<td>137.7</td>
<td>233.4</td>
<td>43.9</td>
<td>30.2</td>
<td>19.1</td>
<td>19.1</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>BU Profit</td>
<td>1,441.0</td>
<td>901.4</td>
<td>503.7</td>
<td>205.0</td>
<td>137.5</td>
<td>26.6</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>BU Income Tax</td>
<td>503.3</td>
<td>389.5</td>
<td>295.2</td>
<td>40.0</td>
<td>23.7</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>BU Additional Profit Tax</td>
<td>491.3</td>
<td>284.7</td>
<td>156.5</td>
<td>100.0</td>
<td>71.1</td>
<td>0.0</td>
<td>38.2</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>BU Value Added Tax</td>
<td>18.0</td>
<td>25.5</td>
<td>22.6</td>
<td>5.9</td>
<td>5.8</td>
<td>8.9</td>
<td>5.2</td>
<td>5.7</td>
<td>9.1</td>
</tr>
<tr>
<td>BU Other Payments</td>
<td>41.8</td>
<td>28.1</td>
<td>32.6</td>
<td>-180.0</td>
<td>-4.0</td>
<td>27.9</td>
<td>22.8</td>
<td>23.3</td>
<td>0.0</td>
</tr>
<tr>
<td>Kitan</td>
<td>340.6</td>
<td>50.1</td>
<td>23.8</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

Source: Petroleum Fund Administration Unit, Ministry of Finance; 2016 Cells with blue backgrounds added by Lii; blue numbers are estimates.

‘BU Other Payments’ include withholding tax, pipeline payments, and wage tax, minus taxes over-collected in the past which were repaid to the oil companies: $215m in 2016 and $140m in 2017.


If current plans continue, TL will be unable to finance its budget in ten years.

$20,000
$18,000
$16,000
$14,000
$12,000
$10,000
$8,000
$6,000
$4,000
$2,000
$0
$0
$5
$10
$15
$20
$25
$30
$35
$40
$45
$50
$55
$60
$65
$70
$75
$80
$85
$90
$95
$100

Sunrise plans approved in 2022 with floating LNG. Sunrise has 5.1trf gas and TL gas 50% of it. Natural gas is worth 33% as much as oil.
Petroleum Fund investments return 2.5% per annum.
Domestic revenues increase 11% per year and 6% per year after 2010.
EDTI recovers 25% of fuel cost from users.
Expenditures 2017 per 2017 GSR, then calculated from 14 model. Spending grows at 8.0% per year now and 8.0% per year after 2030. Annual maintenance costs 8.0% of installed capital.
Includes Seal Supply Base & airport ($500m), 5 Coast Hwy ($1000m), other Tin Mine Project ($2000m), ZEEAM ($5000m), DR airport ($3500m), and Tiber port ($157m).
Includes $1.5bn in contracted and budgeted loans. Including roads, drainage, port, airport and $500m for the Seal Supply Base & airport (project cost $5000m) at 3%, is due in 2025 to be repaid over 25 years.
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Nominal dollars of the day
Austerity starts in 2027, cutting 69% from planned outlays in 2028-2031.

Petroleum Fund balance
- Petrol. revenue + Petrol. Fund return
- Spending (excl.debt serv.)
- Domestic revenues
- Outstanding debt

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As Bayu Undan Dries Up

More than 30 wells, providing small amounts for local Portuguese and Japanese use.

People have looked for oil here for more than a century.

Number of oil and gas wells drilled each year in Timor-Leste's territory

Graph by Lo'o Hamutuk based on historical data and ANPM Lafaek database, accessed June 2017.
As Bayu Undan Dries Up

They knew about Sunrise already.
26 companies drilled 47 test wells under 16 ZOC/A contracts.
They found Elang-Kakatua, Bayu-Undan and Jahal-Kuda Tasi.
In waters occupied by Australia, they also found Laminaria-Corallina.

JPDA contracts in 2003 & 2006
Gray and blue areas have had contracts in the past.

Green lines show seismic exploration.

Crossed circles are 76 test wells drilled since 1992.
Global spending on oil and gas exploration has fallen sharply.

Where TL's oil income comes from

Where the Petroleum Fund gets its money

Graph by [Author's Name] based on data and projections from [Ministry of Finance, TTM reports].
As Bayu Undan Dries Up

Bayu-Undan gross production

Graph by La'o Hamutuk using data from Santos quarterly reports to ASX. Before mid-2006 are estimates.

Bayu-Undan is 80% depleted.

Bayu-Undan Reserve and Production

Graph by La'o Hamutuk based on Santos Annual Reports. March 2017
Data after 2016 are La'o Hamutuk projections.
As Bayu Undan Dries Up

**Kitan brought in $900 million to TL, 5% as much as Bayu-Undan.**

Eni says it’s no longer profitable, but TimorGAP would like to restart it to supply their future refinery in Betano.

![Annual Kitan revenues to Timor-Leste](chart.png)

**Tasi Mane petroleum infrastructure project**

Includes the Suai supply base, Betano refinery, Beaçu LNG plant, 156-km highway, onshore and offshore pipelines, two airports, and two seaports along the south coast.

During 2011-2016, TL spent $286 million on it.

Total project costs could be $15 billion or more if Timor-Leste pays for the entire refinery, pipeline and LNG plant.

The 2017 budget allocates $65m in 2017 and $1.6 billion in 2018-2021, but leaves out the biggest items.

Timor-Leste signed the largest contract in its history in 2015: $719 million to build the Suai Supply Base. The court ruled it illegal and the company gave up, but the government is appealing the ruling.
As Bayu Undan Dries Up

Sunrise and the maritime boundary dispute

Australian companies began exploring Sunrise in the early 1970s, after Australia and Indonesia divided our maritime resources without involving Portugal. In 1989, they closed the "Timor Gap" to share illegally occupied resources in the Joint Development Area.

The 2006 CMATS treaty banned maritime boundaries discussion for 50 years. It divided Sunrise upstream revenues 50-50.

Australia put its greed for oil before respect for its sovereign neighbors or international law.

Based on UNCLOS, TL owns everything north of the median line.

In January 2017, Australia accepted Timor-Leste’s request to revoke the entire CMATS Treaty. Boundary negotiations are finally underway.

The Greater Sunrise stalemate

The project is stalled because Timor-Leste and the companies do not agree on how it should be developed.

Woodside and its partners Shell, ConocoPhillips and Osaka Gas believe a floating LNG plant in the sea is the most profitable.

Timor-Leste wants a pipeline from Sunrise to Beacu to get more tax revenues and anchor the Tasi Mane project.

Under contracts and treaties, the companies can choose the path, but both governments need to approve it.

How and when?
As Bayu Undan Dries Up

**Areas currently under contract**

Only Bayu-Undan is producing today.

TLEA and onshore areas are being evaluated.

TimorGAP still hopes to use the Kitan infrastructure that remains to develop Kuda Tasi, Jahal and other small oil fields, totaling 20-50 million barrels.

But they may be too small and expensive to be commercially viable.
Onshore blocks were recently assigned. Many people live in them.

TIMOR GAP, E.P., the national oil company of Timor-Leste, was awarded exclusive petroleum exploration rights to this Onshore Block by governmental decree in December 2015.

TIMOR-LESTE PETROLEUM VALUE POTENTIAL
(to be explored & developed in the next 50 years)

- Timor-Leste's TOTAL PETROLEUM INITIAL IN-PLACE (PIIP) is in the range of 12-17 Billion Barrel Oil Equivalent (BOE)
- TIMOR GAP estimates the recoverable resources will be around 6.3 Billion BOE (as a comparison Bayu Undan reserve is ~ 1 Billion BOE)
- The monetary value of these resources at average US$ 59 /barrel in the next 50 years is US$ 372 Billion
- Assuming the cost per barrel = US$ 35/barrel, then a total of at US$ 220 Billion will go into the expenditures in exploration, engineering, simple to complex services, fabrications (small, medium to larger scale), installations/constructions, operations and maintenance.
- Therefore, the country want to develop its infrastructures, capabilities in the services, engineering and fabrications in the next decades to capture some of these expenditures in its economy.
ANPM: TIMOR-LESTE RESERVES VOLUME AND PROSPECTIVE RESOURCES 1-4

<table>
<thead>
<tr>
<th>MMBOE</th>
<th>3,306</th>
<th>5,976</th>
</tr>
</thead>
<tbody>
<tr>
<td>YET-TO-FIND RESOURCES</td>
<td>43%</td>
<td></td>
</tr>
<tr>
<td>ALREADY BOOKED/AWARDED</td>
<td>-</td>
<td>57%</td>
</tr>
</tbody>
</table>

- ANP data set up to ~2.6 BBOE
- Significant opportunity for future Timorese participation in petroleum
- Expected reserve range of 5 - 160 mmboe / field
- Largely Greater Sunrise and Bayu Undan
- Represents easiest molecules to produce & near- to mid-term focus

<table>
<thead>
<tr>
<th>Proven</th>
<th>Probable</th>
<th>Possible</th>
<th>Prospective</th>
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</thead>
<tbody>
<tr>
<td>8</td>
<td>28</td>
<td>54</td>
<td>121</td>
</tr>
<tr>
<td>Resource Life (years)</td>
<td>384</td>
<td>983</td>
<td>1,303</td>
</tr>
</tbody>
</table>

Notes: 1) Data a combination of all external data (Rystad, IHS, Wood Mackenzie and internal ANP data (including the results of the Spectrum survey) – see “Resource Potential & National Priorities” section in full report for more details; 2) Does not include definitive view of new prospectivity in TLEA from the 2014 CGG survey with higher resolution and view on e.g. sub-thrust, shallow and other plays; 3) Greater Sunrise included in #346; 4) Remaining reserves for BU & Kitan calculated based on reserve data provided minus cumulative production; 5) Based on 2014 production

Source: ANP data; IHS; Rystad; SBC analysis

High Reserves / Resource life as a result of undeveloped Sunrise field resources & declining production

What’s most important for Timor-Leste’s future?

The new airport in Suai cost more than Timor-Leste will spend on health care for the entire nation in 2017.
Thank you.

You will find more and updated information at

• La’o Hamutuk’s website
  http://www.laohamutuk.org

• La’o Hamutuk’s blog
  http://laohamutuk.blogspot.com/

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