

How long will the Petroleum Fund carry Timor-Leste?

By Charles Scheiner, 17 February 2014 ¹

Abstract

Oil and gas provides about 95% of Timor-Leste state revenues and four-fifths of GDP. Income from exporting non-renewable petroleum wealth is channelled through a Petroleum Fund which contains US\$15 billion. Many expect that the Fund's balance and investment earnings will pay for state activities after the oil and gas fields are exhausted, which could be by 2020 if the Greater Sunrise project remains stalled. Unfortunately, the Petroleum Fund may be empty five years after that.

This paper describes a model to estimate how long the Petroleum Fund will be able to finance state activities. The model incorporates historical and projected data, including recurrent and capital spending, domestic revenue, loans and repayments, petroleum income and return on Petroleum Fund investments. It allows changes to these parameters as well as to anticipated oil market prices, interest rates and Sunrise development options.

The prospect that the Petroleum Fund could be gone in a decade underscores the urgency to develop Timor-Leste's non-oil economy, increase domestic revenue and use public funds wisely.

Oil and gas provided more than 95% of Timor-Leste state revenues² and comprised 81% of GDP (RDTL DGS 2013) in 2012. Income from exporting non-renewable petroleum wealth is channelled through the Petroleum Fund, which contains US\$15 billion. Many believe the Fund will pay for state activities after the oil and gas fields are exhausted, which could happen within six years, but the Petroleum Fund may be empty by 2025.³ Timor-Leste has about a decade to use its finite oil resources to underpin long-term prosperity and development.

As in all countries, decision-makers in Timor-Leste need solid information to develop sound policies. Aspirations are essential, but planning should not rely on unrealizable dreams. This paper describes a model that projects how long the Petroleum Fund will be able to finance state activities. The model incorporates historical and projected data, shows the effects of external factors and policy decisions, and tests different assumptions.

When Timor-Leste's state revenues can no longer cover expenses, the nation will enter an 'austerity' phase, with drastic implications for the state and its citizens. This model explores when that will happen and how severe it will be.⁴

Petroleum Dependency and the Resource Curse

Timor-Leste is extremely petroleum-export-dependent because its non-petroleum economy is so small. Although 19% of Timor-Leste's economy is 'non-petroleum,' about half of this is from re-circulated oil and gas money disbursed by the State. When the wells run dry, this will also end.

Timor-Leste's economy and politics are typical of the 'resource curse' (Neves, 2013). In addition to high inflation, growing foreign debt and neglect of non-petroleum sectors, the country imports 33 times as much as it exports (RDTL DGS 2014). Until 2013, its state budget was one of the fastest-growing in the world. Nearly half of state expenditures pay foreign contractors to build infrastructure, while investment in human resources – health and education – is far below international norms. However, the state pays for some overseas education and health care, enabling a select few to escape inadequate local services.

Timor-Leste does not have enough oil and gas to sustain the country for very long. If the non-oil economy hasn't developed when it runs dry in half a generation, many Timorese people will join the majority who already live below the poverty line.

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2 During 2012 Timor-Leste received \$3,559 million from oil and gas revenues, \$401m from investing the Petroleum Fund (RDTL MoF 2013), and \$136m in other income (RDTL MoF 2013f). Preliminary 2013 figures shows \$3,075m from oil and gas, \$865m from PF investments (Central Bank 2014), and \$147m in other income (RDTL MoF 2014).

3 Timor-Leste has two producing oil fields. Kitan will stop production in 2016 and Bayu-Undan will cease in 2020 (RDTL MoF 2013b). If the political uncertainties currently preventing development of the Greater Sunrise field are resolved, that field could provide revenues to Timor-Leste for 30 more years, totaling \$25-\$35 billion, about as much as Bayu-Undan.

4 The morally challenging decisions about which essential services to cut during austerity are beyond the scope of this paper.

Sustainable budgeting is not a new idea in Timor-Leste

In 2011, Ministry of Finance advisors wrote:

Policies are fiscally sustainable if: there is enough money to pay for expenditures in the long term. The Government is not going to run out of money in the future.

Policies are fiscally unsustainable if: expenditure is too high to be paid for in the long term. At some point in the future the Government will run out of money and will have to sharply reduce expenditure (RDTL MoF 2013c).

Fiscal sustainability has been discussed in Timor Leste since before it set up its Petroleum Fund (PF) in 2005 (La'o Hamutuk 2005a; La'o Hamutuk 2013). The Fund receives all state income related to gas and oil, and invests it overseas, redepositing the return on investment into the Fund.

The Fund's rationale was summarized by La'o Hamutuk:

Our petroleum wealth will have been entirely transformed into money before the middle of this century. If we have not saved and invested it wisely, preparing for our post-petroleum future, our grandchildren's children may endure worse poverty, unemployment, maternal mortality, illiteracy, disease and lack of services than we live with today. This is the experience of people all over the world.... (La'o Hamutuk 2005)

The Estimated Sustainable Income (ESI) benchmark for annual withdrawals is calculated as 3% of the balance in the Fund added to the net present value of expected future revenues from oil and gas fields with approved development plans.⁵ Although this was intended to provide investment income after the oil is exhausted, overspending the ESI and difficulty of projecting future oil revenues have made it less certain.

Unfortunately, the ESI is non-binding;⁶ it was violated from 2008 through 2012.⁷ Fiscal sustainability and inter-generational equity are often invoked by officials, but suggestions for a stronger effort (UNDP 2011; Scheiner 2011; La'o Hamutuk 2012; *Petroleum Economist* 2013) have been unwelcome (RDTL Spokesperson 2011; RDTL Spokesperson 2013) until recently. Nevertheless, the World Bank made it a focus of its new strategy (World Bank 2013).

In May 2013, the Ministry of Finance held public workshops on 'Yellow Road'⁸ scenarios for fiscal sustainability (RDTL MoF 2013d). Although they reach similar conclusions to this paper, their recommendations are impractical. Nevertheless, the Government initially tried to limit 2014 appropriations to \$1.2 billion, which had increased to \$1.5b when the Government proposed its budget to Parliament (RDTL MoF 2013f), which approved that figure in January 2014 (La'o Hamutuk 2014). Although \$1.65b was appropriated in the 2013 budget, actual spending during 2013 was under \$1.2b.

In mid-2013, Bayu-Undan operator ConocoPhillips reduced its projection of future revenues by 49%, with production to end four years earlier than previous estimates. This downgrade is reflected in the 2014 budget (although sceptical officials have contracted an independent review and believe that Timor-Leste has more oil than has been identified). Partly in response, for the first time in history, the Government withdrew less than the Parliamentary limit from the Petroleum Fund during 2013.⁹

⁵ At present, this includes the Bayu-Undan and Kitan fields in the Joint Petroleum Development Area, from which Australia takes 10% of the revenue. As the development plan for Greater Sunrise is not yet approved, it is not included in the ESI calculation.

⁶ The ESI rule has been weakened over time due to Government interpretation, legal revision and less prudent oil price projections.

⁷ The \$1,500m State Budget for 2014 will withdraw \$271m more from the PF than the ESI of \$632m (La'o Hamutuk 2014, RDTL Ministry of Finance 2013f), although La'o Hamutuk suggested to Parliament that this is unwarranted (La'o Hamutuk 2013b) and the Parliamentary Committee on Public Finances agreed (RDTL Parliament 2013).

⁸ Timor-Leste's Government has held internal 'Yellow Road' workshops since 2009, but opened them to the public in 2013. The meaning of the phrase is unknown, although it worryingly resembles the 'Yellow Brick Road' to the sham Wizard of Oz.

⁹ The 2013 budget authorized \$787m to be withdrawn from the Fund, equal to the Estimated Sustainable Income, but the Government withdrew only \$730m, because much more had been withdrawn during 2012 than the government could spend (La'o Hamutuk 2013a). Nevertheless, 2013 ended with \$634m in the Treasury account, more than triple the cushion the Government says it needs.

When President Taur Matan Ruak promulgated the 2014 State Budget in early February, he wrote Parliament:

Once again, I am concerned the persistence of excessive dependence of government revenue from the Petroleum Fund. I am absolutely convinced that it is urgent to correct this situation. ... I believe that it is necessary to adopt active policies to diversify economic development... (RDTL President 2014).

Methodology

The model described in this paper explores four main scenarios. Its predictions are not precise because nobody knows what oil and gas prices will be next week, let alone in 2030. However, by changing the inputs to these scenarios, the model shows how they affect the results.

The model takes an engineering approach: explicit assumptions and clear causal relationships (e.g. higher world oil market prices lead to increased oil revenue and higher costs for fuel). It avoids correlations (e.g. building infrastructure results in GDP growth). It does not estimate macroeconomic indicators like GDP, inflation, poverty or trade balance, but simply projects state income and outgo.

What the model produces

The spreadsheet uses history from 2008 through 2012 (RDTL Ministry of Finance 2013f and 2013g) and La'o Hamutuk projections for 2013, based on the Transparency Portal (RDTL Ministry of Finance 2014). The 2014 information reflects the enacted budget (La'o Hamutuk 2014). For 2015-2066, it makes annual calculations based on the previous year and certain assumptions, yielding the following:

- Government spending for the year, disaggregated into: salaries, transfers, generator fuel, infrastructure operation & maintenance, other goods & services, minor capital, development capital (including major infrastructure projects) and debt service.
- Government revenues for the year, disaggregated into: electricity revenue, taxes the Government pays to itself,¹⁰ other non-oil taxes and fees, Petroleum Fund withdrawals and loans received.
- Petroleum Fund receipts from Bayu-Undan/Kitan, Sunrise oil, Sunrise gas upstream and Sunrise gas downstream.
- Return on investing the Petroleum Fund.
- Based on the above, it calculates outstanding debt, surplus (saved in the Petroleum Fund) or deficit (the severity of 'austerity' spending cuts), Petroleum Fund balance and ESI.

In addition to numbers, the model produces graphs showing a summary, revenues and spending. Calculating is done in dollars-of-the-day, but the graphs can adjust for worldwide inflation.

What the model takes in

The model includes three worksheets:

1. **Petroleum revenues.** Deriving annual revenues from Bayu-Undan, Kitan and Greater Sunrise, based on the following inputs:
 - World crude oil market prices, using the US Energy Information Administration (EIA)'s Brent Crude spot price projections (US EIA 2013). Users can choose among low, reference and high cases in five increments.
 - Most petroleum income after 2020 will have to come from Sunrise natural gas, but the value of gas has fallen as non-conventional sources come online (Hofman, 2013, 9). Since the EIA projects gas prices for the US market (not global LNG), the model uses a long-term gas price equal to one-third (or another ratio) of the price of Brent crude with the same energy content.
 - Bayu-Undan (B-U) has long-term LNG contracts indexed to oil prices, so the model doesn't project gas prices for B-U. However, the model allows enlarging the B-U reserve, which would extend its production. It also optionally includes the earlier, higher revenue projections.

¹⁰ 'Domestic revenue' includes import and corporate taxes paid by Government contractors and suppliers which are added to the cost of the contract. This comprises about one-third of the money taken in from non-oil, non-electricity taxes and fees.

- The model also considers when the Sunrise project will be developed, whether its gas will be piped to and liquefied in Timor-Leste, the amount of recoverable gas, and how extraction (upstream) revenues will be divided between Timor-Leste and Australia.¹¹
2. **State Budget.** Based on the information above and other inputs (including borrowed income and debt repayments), the model calculates annual revenues and expenditures. A few assumptions and relationships are built in, but the following parameters can be changed:
 - Rate of return on investing the Petroleum Fund (simplified as a fixed percentage over time).
 - Percentage of electricity generation fuel cost recovered from ratepayers by the state electricity utility (currently 15%).
 - Other domestic revenues (taxes and fees). Annual rate of increase can be specified for 2015 and 2030; the model interpolates for 2016-2029.
 - Expenditure to maintain physical infrastructure, as a percentage of the total capital investment to date.
 - Expenditure to build specific mega-projects (Tasi Mane Project components, Dili Airport and Tibar Port).
 - Recurrent expenditure (salaries, transfers, non-fuel goods & services, minor capital). These are given the same percentage increases, specified for 2015 and 2030; the model interpolates.
 - Discount rate for future petroleum revenue (for estimating ESI).
 3. **Borrowing and debt service.** Loans are included in state revenues, and debt repayments are included in state expenditures.
 - The model includes \$199 million in loans already contracted with the ADB, Japan and the World Bank, and can include \$292 million in other loans listed in the 2014 State Budget.
 - It allows other loans which are not yet decided, including for additional roads and the Tasi Mane Project (Suai Supply Base, highway and refinery, but not the pipeline/LNG plant -- the oil companies should pay for that). Amounts, interest and repayment periods can be specified.
 - Timor-Leste could borrow to try to close the budget deficit and hold off austerity. One can specify the dates, loan amount, interest rate and repayment period.
 4. **Other assumptions** are hard-coded, but could be tested in the future:
 - Tax revenues from Government imports (3-4%, see note 10).
 - Annual expenditure on unspecified capital projects (\$351m in 2014, increasing with global inflation).
 - Population growth (2010 Census 'recommended scenario'; others can be selected (RDTL DGS 2013b)).
 - Electricity usage per citizen (estimated to double between 2013 and 2032).

Results

In each of the following graphs, text at upper left summarizes the assumptions, while the box at upper right summarizes the outcomes. The vertical scale is in millions of US dollars, and the horizontal axis shows years from 2008 to 2040, although the underlying calculations go through 2066. All amounts are in U.S. dollars-of-the-day. The background turns red during austerity -- when desired spending exceeds available money.

The **Base Case** represents a continuation of recent history with a few plausible improvements. It is not prudent enough for planning purposes, but is an optimistic reference for comparison with other scenarios. It makes hopeful assumptions for oil and gas prices and Petroleum Fund investment return, and expects Sunrise gas to be piped to Timor-Leste. It assumes only contracted and budgeted loans and

¹¹ Under the 2007 Certain Maritime Arrangements in the Timor Sea (CMATS) Treaty with Australia, Timor-Leste will get 50% of Sunrise upstream revenues, but if CMATS is terminated, TL would get only 18% under the International Unitization Agreement (IUA). However, if a boundary is established under international legal principles, TL could own 100% of Greater Sunrise (La'o Hamutuk 2014a).

that the Suai Supply Base will be built, but not the South Coast Highway or refinery. Under this scenario, Timor-Leste cannot finance its full budget after 2025, and will have to cut two-thirds of desired spending starting in 2027.

Figure 1. Base Case summary

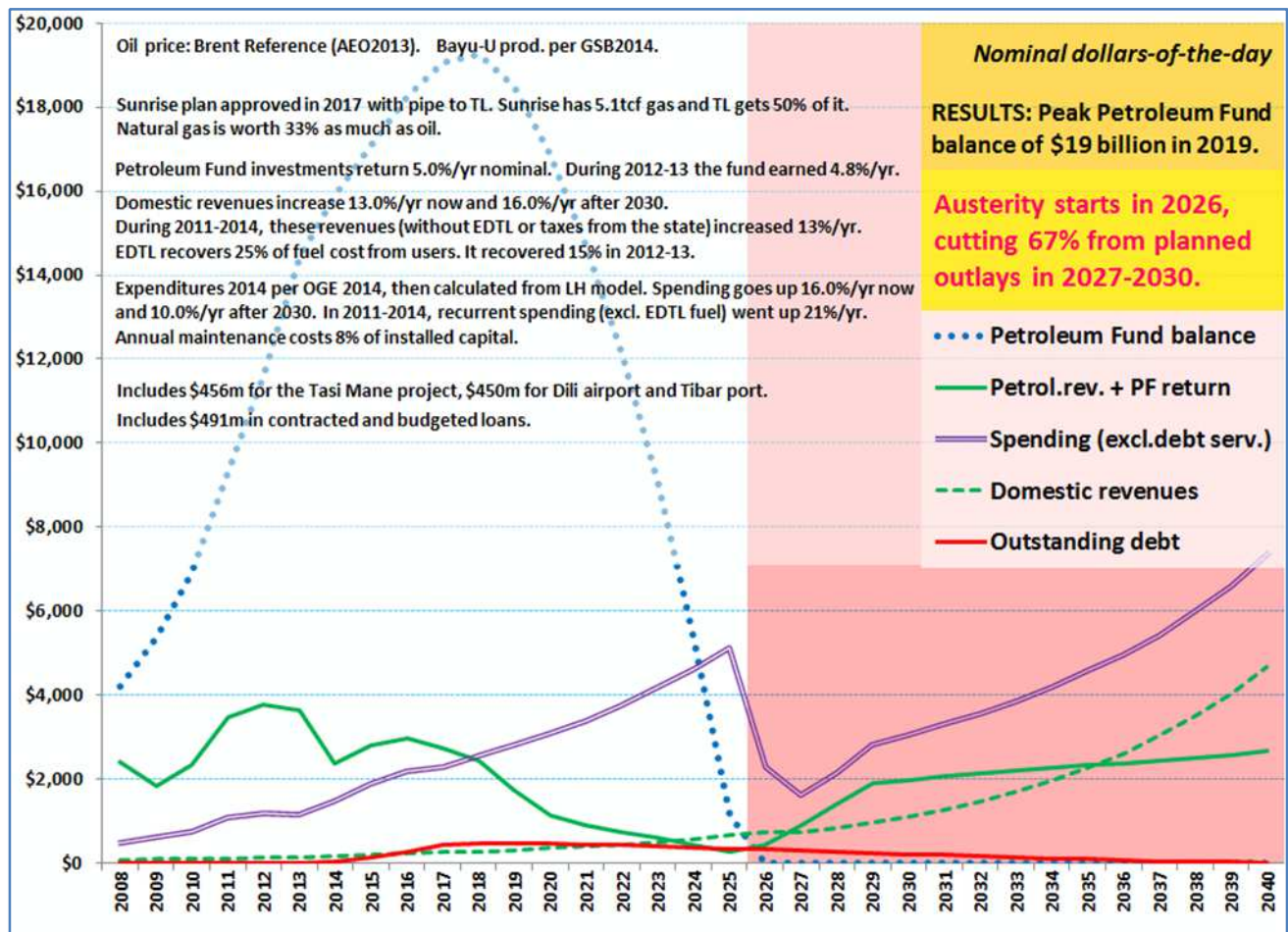


Figure 2. Base Case spending

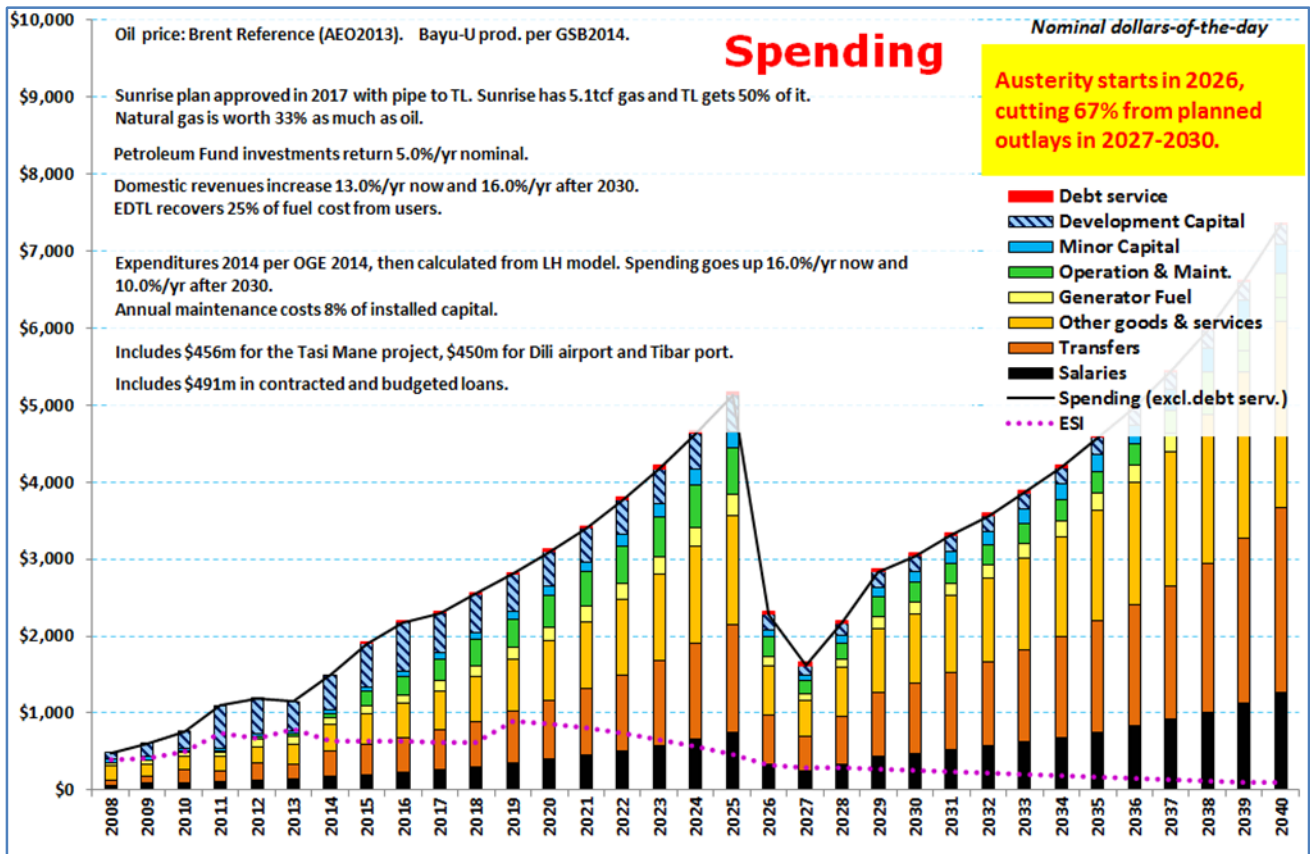
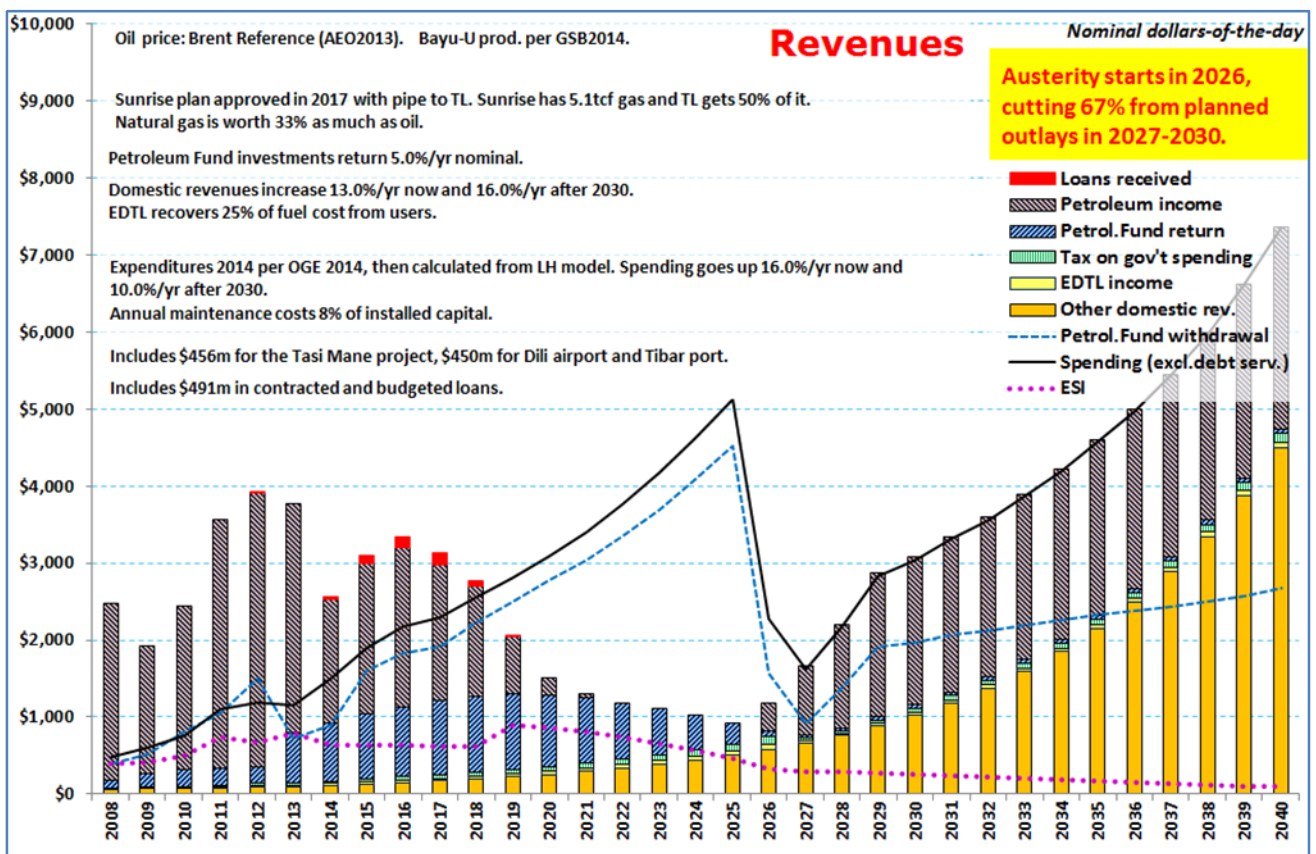
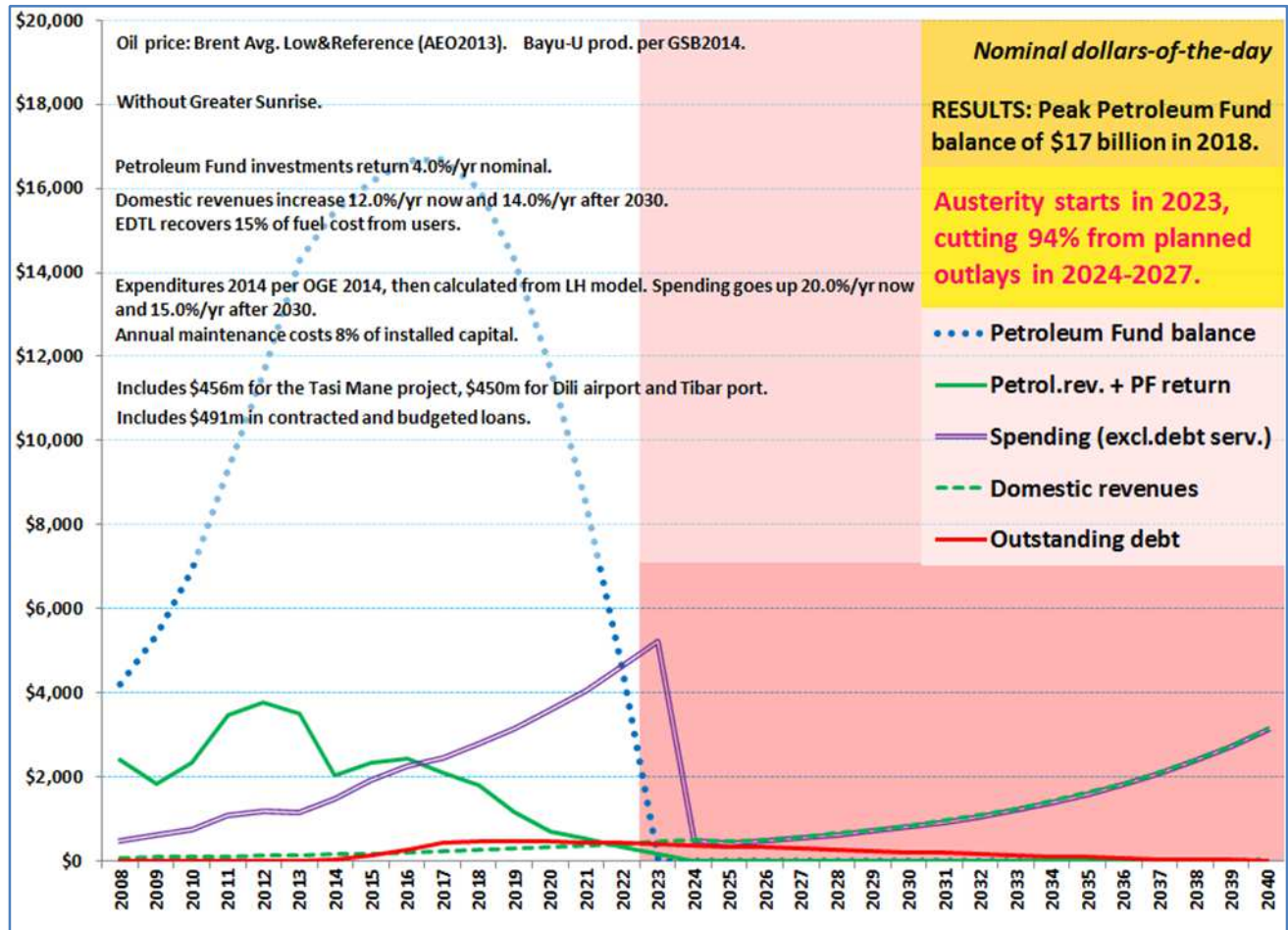


Figure 3. Base Case revenues



Estimating too high is more dangerous than being too cautious, as it can cause irreversible damage when the money is gone -- malnutrition, uneducated children, poverty, death. With prudent assumptions more consistent with recent history¹² -- lower oil prices and investment returns, no Sunrise project, lower non-oil revenues and higher state expenditures -- austerity comes in 2023, three years earlier than the **Base Case**, with much deeper cuts.

Figure 4. Prudent Case summary



On the other hand, more optimistic (unrealistic) assumptions would improve the outcome. If we start with the Base Case but have these wishes granted:

- Higher Bayu-Undan production (using projections from before ConocoPhillips downgraded them in mid-2013)
- World oil prices halfway between EIA’s reference and *high* scenarios (a foolhardy assumption)
- Higher long-term gas prices (33% of the value of oil)
- Petroleum Fund investments earn 7% per year (they earned 6.6% in 2013, which was an exceptionally good year)
- Slower growth in expenditures and faster growth in domestic revenues.

If all this goes well, Timor-Leste gets seven more years (until 2033) before austerity kicks in, and the cuts will be “only” 60%. The summary graph for this “**Foolhardy Case**” is in Appendix Figure A-1.

It is difficult to envision a plausible scenario which does not hit the wall within a generation. The Ministry of Finance’s ‘Yellow Road’ demands immediate salary and other unachievable cuts, and expects the non-oil GDP to continue growing at double-digit rates while the state budget shrinks, which is

¹² This case uses the average of the low and reference EIA prices, which is what the Ministry of Finance uses to estimate the Sustainable Income. It assume 4% return on Petroleum Fund investments and historical levels of electricity cost recovery and revenue and expenditure growth.

inconceivable.¹³ Although the IMF expected Timor-Leste to follow the Yellow Road (IMF 2013), political realities forced an immediate detour: less than six months after the Yellow Road workshops, 2014 appropriations are 33% above the targeted value.

However, it is possible for Timor-Leste's Petroleum Fund, known reserves and fiscal discipline to carry the country for more than 30 years, enough time for a strategic, concerted effort to develop non-oil revenues and economic activity. La'o Hamutuk's **Almost Sustainable Case** involves halting the Tasi Mane Project, downsizing the Dili airport and Tibar Port projects, avoiding further borrowing, accepting a floating LNG plant so that Sunrise development can proceed, and limiting recurrent spending (salaries, transfers and goods & services) to the Estimated Sustainable Income plus domestic revenues. Spending above this level would only be permitted for construction and maintenance of essential capital infrastructure. In this scenario, graphed in Appendix Figures A-2 and A-3, state expenditures in 2025 would be \$2.5 billion, about half of the Base Case, requiring significant improvements in efficiency and frugality. In other words, moderate managed reductions today can avert severe forced cuts ten years from now.

Table 1 summarizes the results and assumptions from these four scenarios. **Highlighted bold** shows differences from the **Base Case**.

Table 1. Comparison of four cases

	Base	Prudent	Foolhardy	Almost Sustainable	
Results	Pre-austerity budget (\$b)	\$5.1	\$4.6	\$9.9	\$12.9
	Austerity starts (year)	2026	2023	2033	2047
	Austerity depth (how much must be cut)	67%	94%	60%	9%
	Petroleum Fund (PF) peak amount (\$b)	\$19	\$17	\$32	\$20
	PF peak (year)	2019	2018	2024	2019
	Total debt service costs (\$b)	\$0.19	\$0.19	\$0.19	\$0.05
Oil and gas	Oil price assumption (Brent)	Reference case	Avg. Low & Ref	Avg. High & Ref	Avg. Low & Ref
	Bayu-Undan production	2013 projections	2013 projections	2012 projections	2013 projections
	Sunrise gas liquefied where?	Beasu	Not developed	Beasu	Floating
	When Sunrise agreed (year)	2017		2017	2016
Revenues	PF annual investment return	5%	4%	7%	5%
	Annual increase in 2015	13%	12%	13%	13%
	Annual increase after 2030	16%	14%	16%	16%
	EDTL cost recovery (% of fuel outlay)	25%	15%	25%	25%
Spending & loans	'Yellow Road' scenario	2013-14 per OGE 2014, then LH model.	2013-14 per OGE 2014, then LH model.	2013-14 per OGE 2014, then LH model.	Capital + O&M + ESI + domestic revenues
	Annual increase in 2015	16%	20%	16%	Per revenue (~10%)
	Annual increase after 2030	10%	15%	10%	Per revenue (~7%)
	Dili airport & Tibar port invest. (\$b)	\$0.45	\$0.45	\$0.45	\$0.15
	Tasi Mane project investment (\$b)	\$0.46	\$0.46	\$0.46	\$0.10
	Loans (\$b)	\$0.49	\$0.49	\$0.49	\$0.20

The model allows many changes to other assumptions, showing how they affect fiscal sustainability. Table A-1 in the Appendix show that changes in world oil market prices and the size of the Bayu-Undan reserve can advance or delay austerity by at most two years, as well as changing the depth of the

¹³ All the growth in non-oil GDP since 2006 has been due to petroleum production and government spending. Agriculture has been shrinking in real dollars, while industry remains miniscule and other sectors are stagnant. (RD TL DGS 2013).

spending cuts after austerity begins by up to 7%. The base case assumes a Sunrise pipeline to Beasu; if the project is delayed for six years or more, austerity becomes 21% deeper, but it doesn't come any earlier. On the other hand, if Sunrise is developed soon with floating LNG, austerity is only 3% deeper than it would be if the gas were piped to Timor-Leste. Changes in long-term gas prices and the size of the Sunrise reserve affect austerity by only about 5%.

As shown in Table A-2, if Petroleum Fund investments earn 2% more or less than the base case (5%), austerity comes a year later or earlier, and will be about 4% easier or harsher. Similarly, a change in the annual growth of domestic revenues by 2% would not change when austerity starts, but would make it 4% more or less severe. On the other hand, a 2% change in the rate of expenditure growth would shift austerity by a year, as well as changing its depth by about 10%. If the government were to recover 75% of electric generation fuel costs from ratepayers (it currently recovers 15%), that would reduce the depth of austerity by 2%.

Table A-3 explores the effects of large infrastructure projects and debt. For the Tasi Mane project, the base case includes the Suai airport and supply base, as those are the only components in the 2014 State Budget. If those were cancelled, the depth of austerity would reduce by 1%. On the other hand, if Timor-Leste spends \$2 billion for the South Coast Highway or \$4b for an oil refinery in Betano, austerity could come a year sooner and would be 6% deeper. If these projects are financed with loans, austerity gets 3-4% more severe, as debt repayments will be due after the Petroleum Fund is used up.

One way to delay austerity is with debt financing. Borrowing \$10 billion during 2025-2027 could delay austerity by two years but would increase the severity of the cuts from 67% to 73%. In other words, there will be 20% less money available during austerity than without loans, as creditors will have first claim on state income.

Conclusion

Without drastic changes, Timor-Leste's Petroleum Fund could be used up as soon as 2023-2026. Although changes in external factors and internal policies can add or subtract as much as five years, the result is surprisingly robust. Higher oil prices and reserve sizes, Sunrise LNG in Timor-Leste, and higher Petroleum Fund investment returns will each add only a year or two. Developing Greater Sunrise (regardless of where the gas is liquefied) could reduce the severity of budget cuts during austerity, but total state revenues will still only cover about one-third of desired outlays.

Slower expenditure and faster revenue growth help, but geometrically growing budgets will inevitably consume finite petroleum wealth. Only the **Almost Sustainable** scenario, which requires stronger fiscal restraint than most countries have been able to achieve, averts austerity for more than one generation.

This version of the model incorporates some key factors, but others would be worth exploring:

- Population impacts as the post-1999 baby boom grows up.
- Local inflation, which is higher than global and stimulated by state spending.
- Additional capital projects and sectors (water, roads, bridges), with variable financing.
- Replacement costs for physical infrastructure.
- More refined recurrent spending, including veterans' and other pensions.
- Additional oil and gas discoveries.

This spreadsheet is 'open source.'¹⁴ We hope that others will deepen this analysis or conduct their own research, and that it will help everyone 'take context as the starting point'¹⁵ for decisions which benefit current and future generations of Timor-Leste's people.

¹⁴ This spreadsheet, methodological notes and other related materials will be updated regularly and linked to from <http://www.laohamutuk.org/econ/model/13PFSustainability.htm>

¹⁵ This is Principle No. 1 for 'Good International Engagement in Fragile States and Situations' (OECD 2007).

Appendix

Figure A-1. Foolhardy Case summary

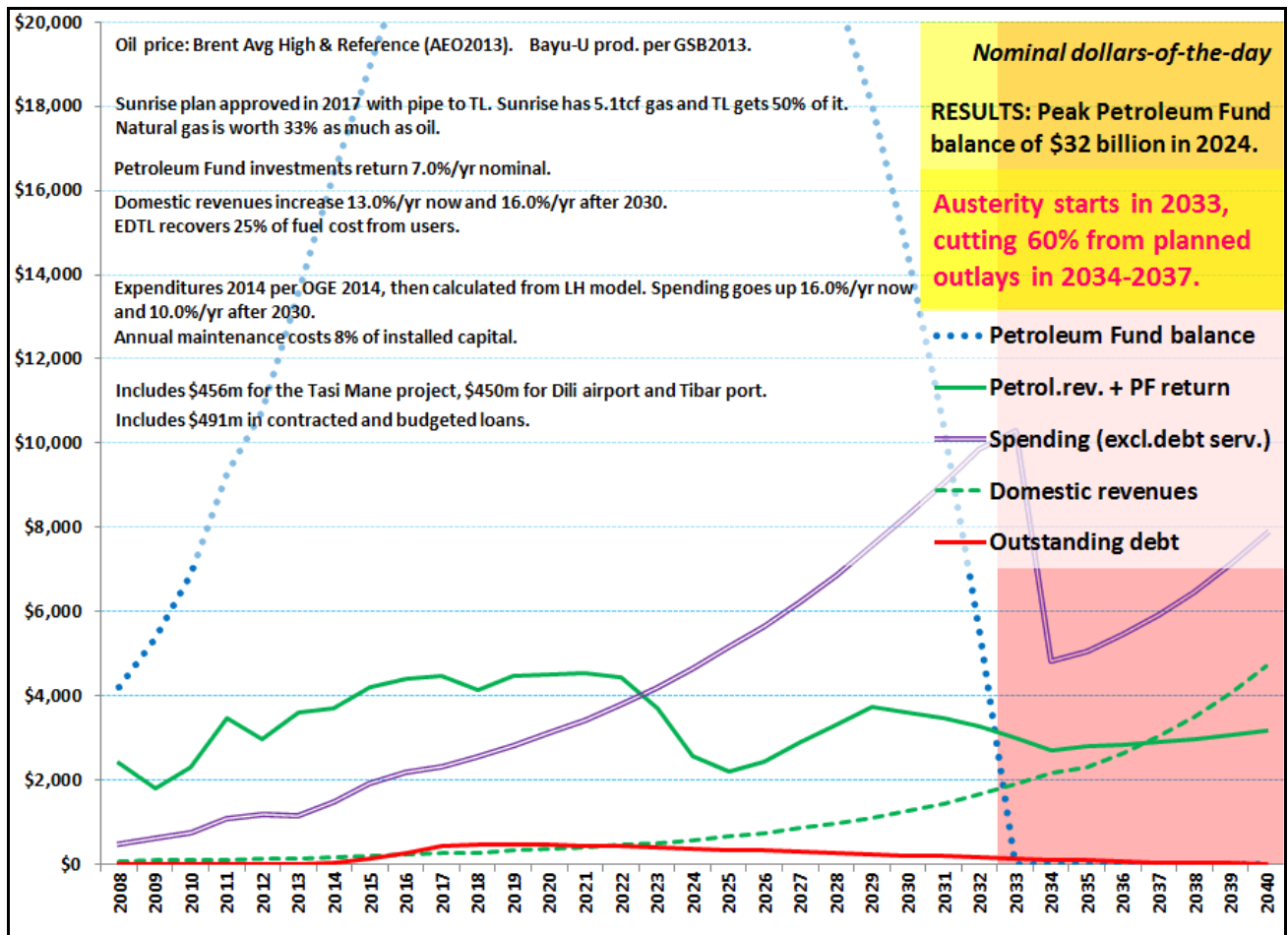


Figure A-2. Summary of 'Almost Sustainable' Case

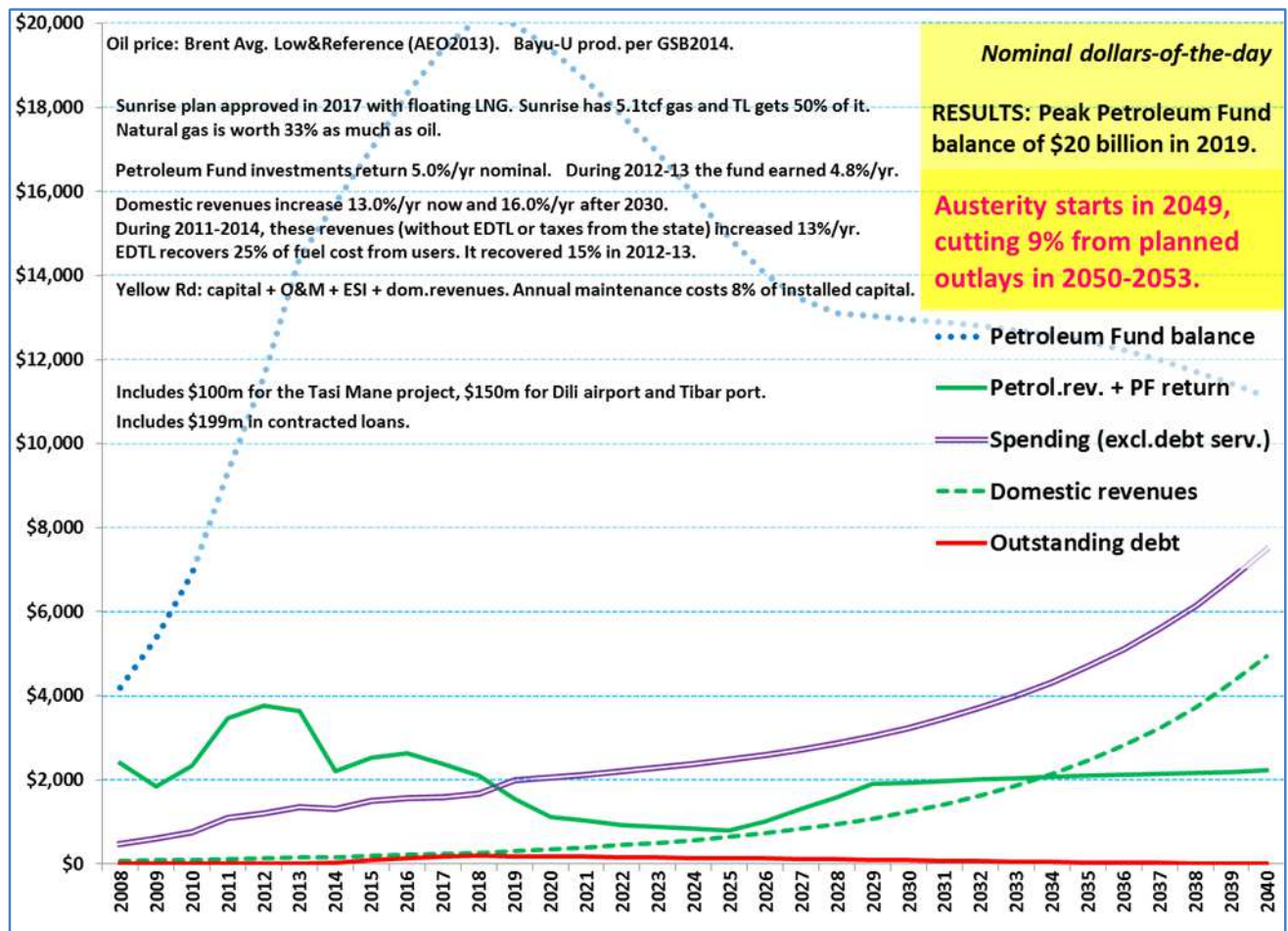
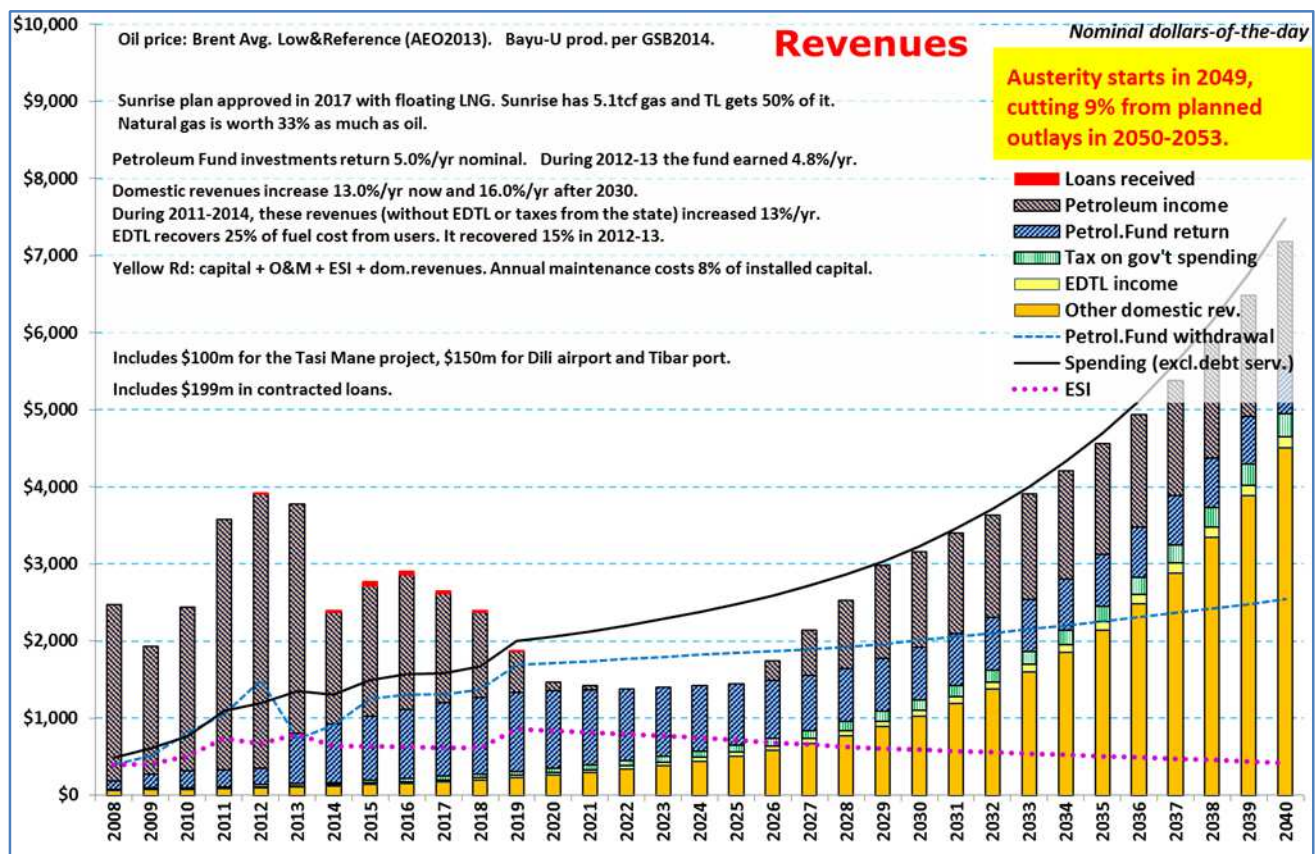


Figure A-3. Revenues in 'Almost Sustainable' Case



Projections for the allocation of expenditures in the Almost Sustainable scenario will require some hard choices, and are beyond the scope of this paper.

The following three tables are described in the main text and show the effects of changing different assumptions from the base scenario.

Table A-1. Effects of changes in petroleum prices and production

Case	Results					Oil and gas					
	Pre-austerity budget	Austerity starts	Austerity depth	PF peak balance	PF peak year	Oil prices (Brent crude)	Bayu-Undan prod.	Sunrise LNG	Sunrise agreed	Sunrise reserve (tcf)	Gas/oil price ratio
Base case	\$5.1	2026	67%	\$19	2019	Ref. case	2013 est.	Beasu	2017	5.13	33%
Higher oil prices	\$5.7	2027	60%	\$22	2019	Avg High & Ref.	2013 est.	Beasu	2017	5.13	33%
Lower oil prices	\$4.6	2025	74%	\$18	2018	Avg Low & Ref.	2013 est.	Beasu	2017	5.13	33%
Larger Bayu-Undan reserve	\$6.2	2028	63%	\$21	2021	Ref.	2012 est.	Beasu	2017	5.13	33%
Floating LNG for Sunrise	\$5.1	2026	70%	\$19	2019	Ref.	2013 est.	FLNG	2017	5.13	33%
Sunrise delayed six years or more	\$5.1	2026	88%	\$19	2019	Ref.	2013 est.	Beasu	2023	5.13	33%
Lower gas prices	\$5.1	2026	69%	\$19	2019	Ref.	2013 est.	Beasu	2017	5.13	25%
Larger Sunrise reserve	\$5.1	2026	62%	\$19	2019	Ref.	2013 est.	Beasu	2017	7.00	33%

Table A-2. Effects of changes in investment return, revenue and expenditure growth

Case	Results					Revenue				Expenditure		
	Pre-austerity budget	Austerity starts	Austerity depth	PF peak balance	PF peak year	PF invest. return	Rev. increase 2015-	Rev. increase 2031-	EDTL cost recovery	Annual infra. O&M	Expend. increase 2015-	Expend. increase 2031-
Base case	\$5.1	2026	67%	\$19	2019	5%	13%	16%	25%	8%	16%	10%
7% Petrol. Fund return	\$5.6	2027	63%	\$22	2019	7%	13%	16%	25%	8%	16%	10%
3% Petrol. Fund return	\$4.6	2025	72%	\$17	2018	3%	13%	16%	25%	8%	16%	10%
High dom. rev. growth	\$5.1	2026	63%	\$19	2019	5%	15%	18%	25%	8%	16%	10%
Low dom. rev. growth	\$5.1	2026	69%	\$19	2019	5%	11%	14%	25%	8%	16%	10%
Hi expenditure growth	\$5.3	2025	76%	\$19	2019	5%	13%	16%	25%	8%	18%	12%
Lo expenditure growth	\$4.8	2027	55%	\$20	2019	5%	13%	16%	25%	8%	14%	8%
Recover 75% fuel costs	\$5.1	2026	65%	\$19	2019	5%	13%	16%	75%	8%	16%	10%

Table A-3. Effects of building large infrastructure projects and debt financing

Case	Results						Project & borrowing			
	Pre-austerity budget	Austerity starts	Austerity depth	PF peak balance	PF peak year	Debt service costs (\$b)	Tasi Mane invest. (\$b)	Tasi Mane loans (\$b)	Tasi Mane interest rate	Other loans (\$b)
Base case	\$5.1	2026	67%	\$19	2019	\$0.2	\$0.5	0		\$0.5
Cancel Tasi Mane Project	\$5.1	2026	66%	\$20	2019	\$0.2	\$0.0	\$0		\$0.5
Build \$2b S. Coast highway	\$4.8	2025	72%	\$18	2018	\$0.2	\$2.5	\$0		\$0.5
Finance highway with loan	\$4.8	2025	75%	\$20	2019	\$1.1	\$2.5	\$2	4.0%	\$0.5
Build \$4b Betano refinery	\$5.4	2025	73%	\$19	2019	\$0.2	\$4.5	\$0		\$0.5
Finance refinery with loan	\$5.4	2025	77%	\$20	2019	\$2.9	\$4.5	\$4	5.0%	\$0.5
Borrow \$10b to hold off austerity ¹⁶	\$6.2	2028	73%	\$19	2019	\$6.9	\$0.46	\$0		\$10.5

¹⁶ This example assumes 5% annual interest, 25 years to repay, and a five-year grace period.

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