# How long will the Petroleum Fund carry Timor-Leste?

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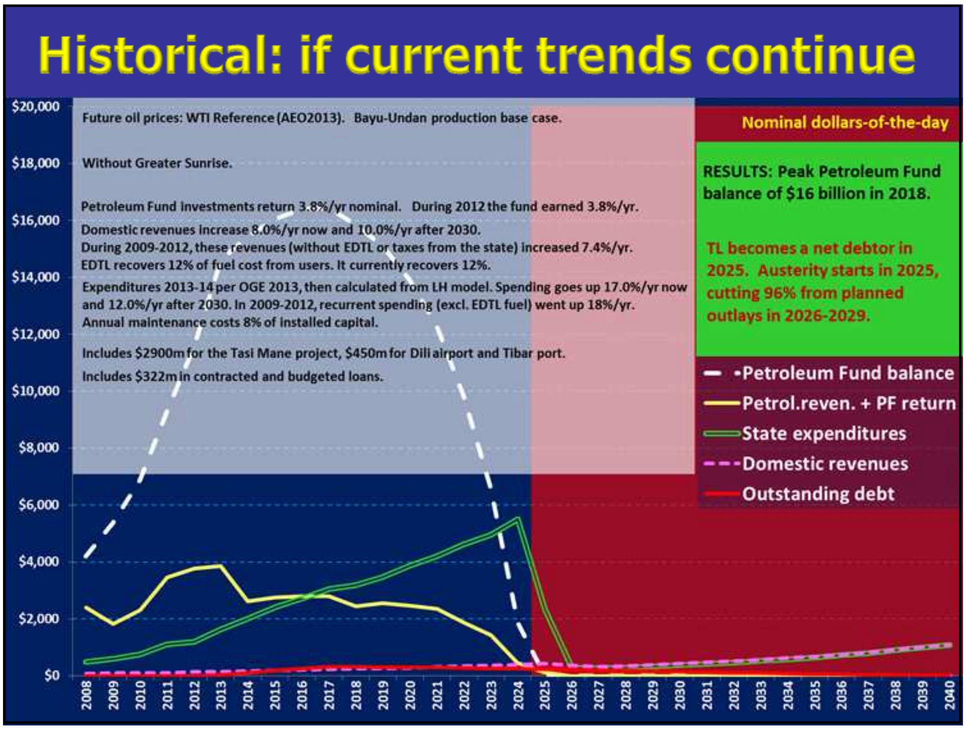
La'o hamutuk

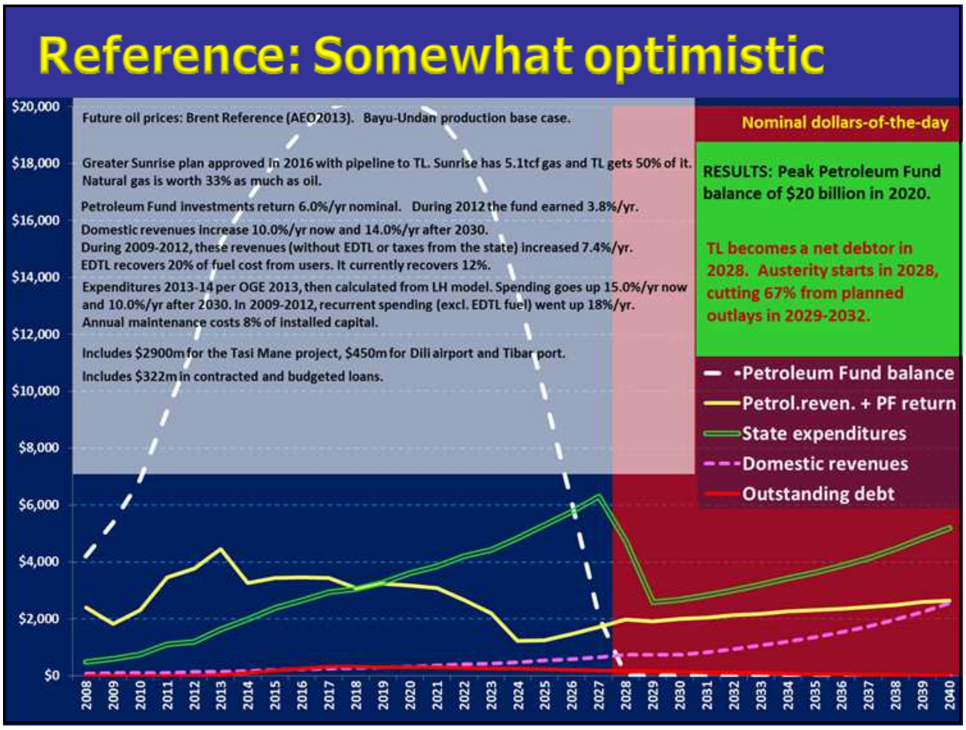
## How long will the Petroleum Fund carry Timor-Leste?

- **With current policies, until 2024.**
- **If we're lucky and smarter, until 2027.**
- **With a lot of luck and skill, until 2036.**
- **If we're lucky, strategic, prudent and wise, until our non-oil economy can replace it.**

**What must we do to prevent Timor-Leste from going broke before today's babies finish secondary school?**

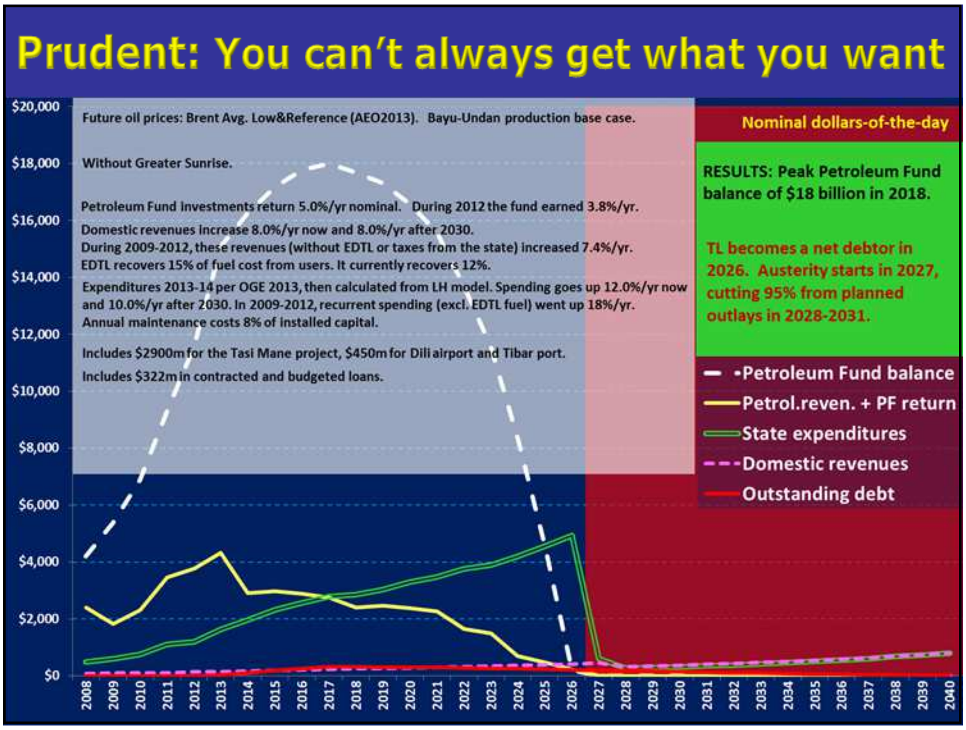


Historical: if current trends continue
Future oil prices: WTI Reference (AEO2013). Bayu-Undan production base case.
Without Greater Sunrise.
Petroleum Fund investments return 3.8%/yr nominal. During 2012 the fund earned 3.8%/yr.
Domestic revenues increase 8.0%/yr now and 10.0%/yr after 2030.
During 2009-2012, these revenues (without EDTL or taxes from the state) increased 7.4%/yr.
EDTL recovers 12% of fuel cost from users. It currently recovers 12%.
Expenditures 2013-14 per OGE 2013, then calculated from LH model. Spending goes up 17.0%/yr now and 12.0%/yr after 2030. In 2009-2012, recurrent spending (excl. EDTL fuel) went up 18%/yr.
Annual maintenance costs 8% of installed capital.
Includes $2900m for the Tasi Mane project, $450m for Dili airport and Tibar port.
Includes $322m in contracted and budgeted loans.
Nominal dollars-of-the-day
RESULTS: Peak Petroleum Fund balance of $16 billion in 2018.
TL becomes a net debtor in 2025. Austerity starts in 2025, cutting 96% from planned outlays in 2026-2029.
Petroleum Fund balance
Petrol.reven. + PF return
State expenditures
Domestic revenues
Outstanding debt
$20,000
$18,000
$16,000
$14,000
$12,000
$10,000
$8,000
$6,000
$4,000
$2,000
$0
2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040

Reference: Somewhat optimistic
Future oil prices: Brent Reference (AEO2013). Bayu-Undan production base case.
Greater Sunrise plan approved in 2016 with pipeline to TL. Sunrise has 5.1tcf gas and TL gets 50% of it. Natural gas is worth 33% as much as oil.
Petroleum Fund investments return 6.0%/yr nominal. During 2012 the fund earned 3.8%/yr.
Domestic revenues increase 10.0%/yr now and 14.0%/yr after 2030.
During 2009-2012, these revenues (without EDTL or taxes from the state) increased 7.4%/yr.
EDTL recovers 20% of fuel cost from users. It currently recovers 12%.
Expenditures 2013-14 per OGE 2013, then calculated from LH model. Spending goes up 15.0%/yr now and 10.0%/yr after 2030. In 2009-2012, recurrent spending (excl. EDTL fuel) went up 18%/yr.
Annual maintenance costs 8% of installed capital.
Includes $2900m for the Tasi Mane project, $450m for Dili airport and Tibar port.
Includes $322m in contracted and budgeted loans.
Nominal dollars-of-the-day
RESULTS: Peak Petroleum Fund balance of $20 billion in 2020.
TL becomes a net debtor in 2028. Austerity starts in 2028, cutting 67% from planned outlays in 2029-2032.
Petroleum Fund balance
Petrol.reven. + PF return
State expenditures
Domestic revenues
Outstanding debt
$20,000
$18,000
$16,000
$14,000
$12,000
$10,000
$8,000
$6,000
$4,000
$2,000
$0
2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040


Dreaming: We win, but still go broke
Future oil prices: Brent Avg High & Reference (AEO2013). Bayu-Undan production 10% over base case, extending production by 1 years.
Greater Sunrise plan approved in 2016 with pipeline to TL. Sunrise has 6tcf gas and TL gets 50% of it. Natural gas is worth 33% as much as oil.
Petroleum Fund investments return 6.2%/yr nominal. During 2012 the fund earned 3.8%/yr.
Domestic revenues increase 10.0%/yr now and 14.0%/yr after 2030.
During 2009-2012, these revenues (without EDTL or taxes from the state) increased 7.4%/yr.
EDTL recovers 50% of fuel cost from users. It currently recovers 12%.
Expenditures 2013-14 per OGE 2013, then calculated from LH model. Spending goes up 12.0%/yr now and 9.0%/yr after 2030. In 2009-2012, recurrent spending (excl. EDTL fuel) went up 18%/yr.
Annual maintenance costs 8% of installed capital.
Includes $2900m for the Tasi Mane project, $450m for Dili airport and Tibar port.
Includes $322m in contracted and budgeted loans.
Nominal dollars-of-the-day
RESULTS: Peak Petroleum Fund balance of $32 billion in 2024.
TL becomes a net debtor in 2037. Austerity starts in 2037, cutting 56% from planned outlays in 2038-2041.
Petroleum Fund balance
Petrol.reven. + PF return
State expenditures
Domestic revenues
Outstanding debt

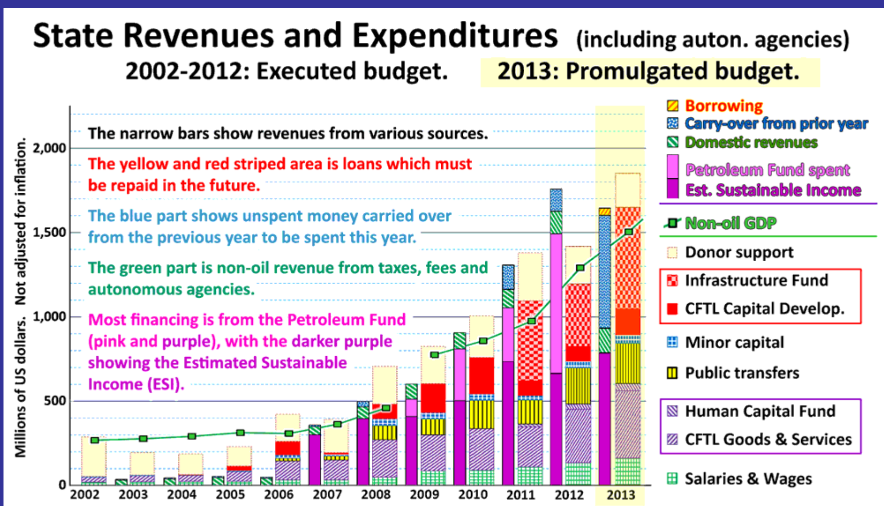

Prudent: You can't always get what you want
Future oil prices: Brent Avg. Low&Reference (AEO2013). Bayu-Undan production base case.
Without Greater Sunrise.
Petroleum Fund investments return 5.0%/yr nominal. During 2012 the fund earned 3.8%/yr.
Domestic revenues increase 8.0%/yr now and 8.0%/yr after 2030.
During 2009-2012, these revenues (without EDTL or taxes from the state) increased 7.4%/yr.
EDTL recovers 15% of fuel cost from users. It currently recovers 12%.
Expenditures 2013-14 per OGE 2013, then calculated from LH model. Spending goes up 12.0%/yr now and 10.0%/yr after 2030. In 2009-2012, recurrent spending (excl. EDTL fuel) went up 18%/yr.
Annual maintenance costs 8% of installed capital.
Includes $2900m for the Tasi Mane project, $450m for Dili airport and Tibar port.
Includes $322m in contracted and budgeted loans.
Nominal dollars-of-the-day
RESULTS: Peak Petroleum Fund balance of $18 billion in 2018.
TL becomes a net debtor in 2026. Austerity starts in 2027, cutting 95% from planned outlays in 2028-2031.
Petroleum Fund balance
Petrol.reven. + PF return
State expenditures
Domestic revenues
Outstanding debt

# Petroleum Dependency

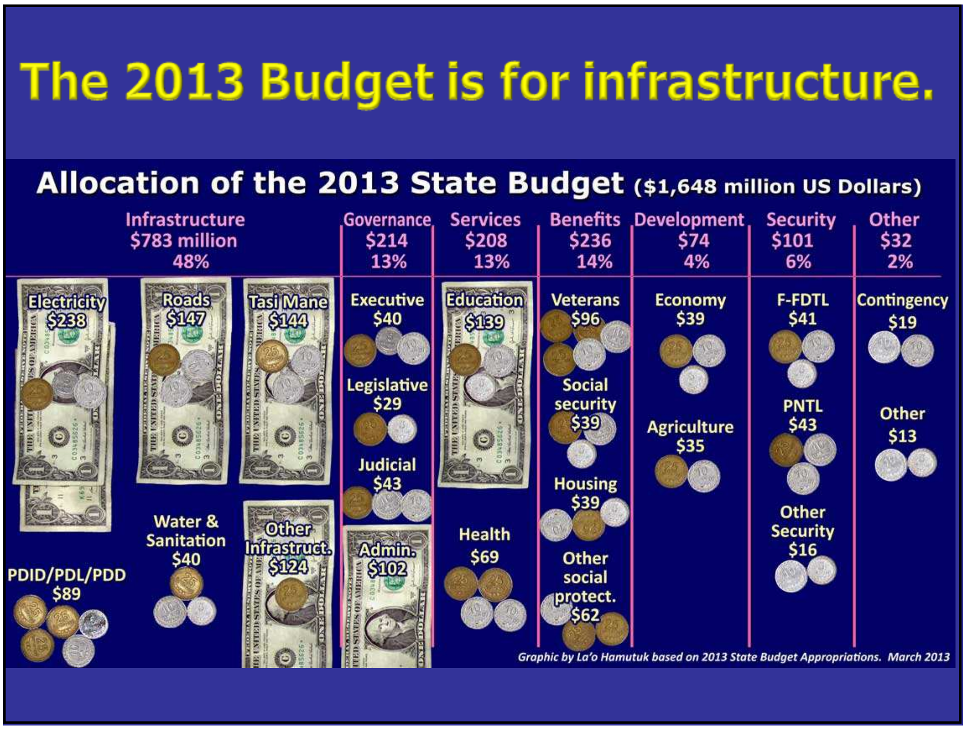
- 2013 State Budget:.................................. $1,648 million
  $787 million (48%) will be from the Petroleum Fund in 2013.
  $680 million (40%) more is from the PF in the past and future.
- Non-oil GDP in 2011:...................... $1,046 million
  Petroleum GDP in 2011:.................. $3,463 million (81%)
- State activities, paid for with oil money, are about half of our "non-oil" economy, because some of this money circulates in the local economy.
- Balance of trade (2012): $670m imports, $31m exports.

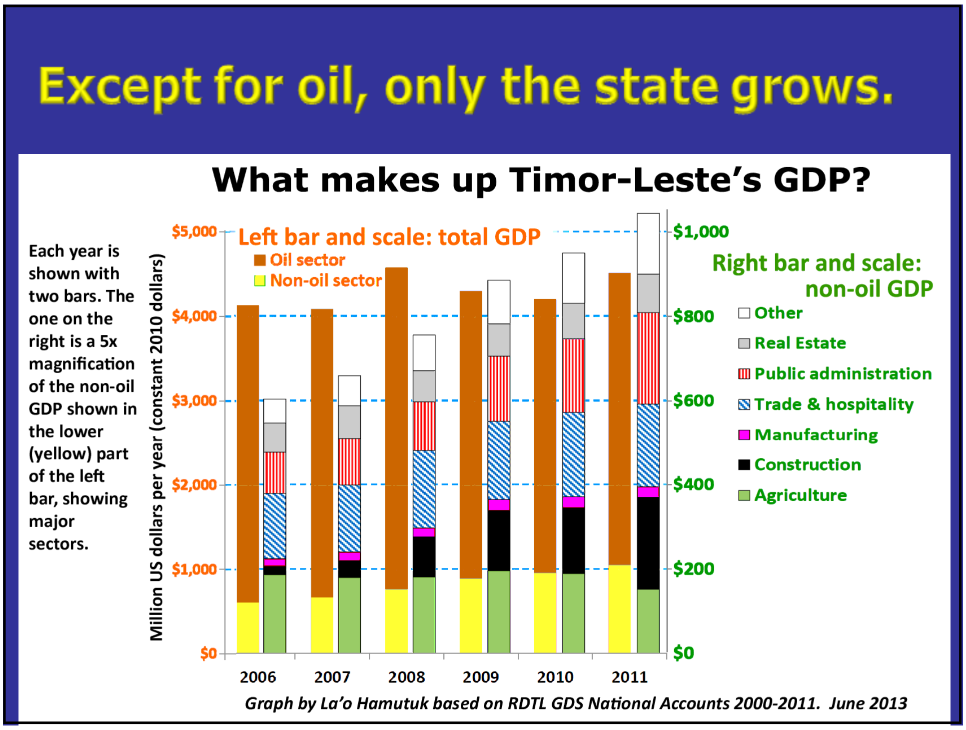
**South Sudan is the only country more dependent on oil and gas exports than Timor-Leste.**

# State Budgets 2002-2013




**The State Budget goes up far above inflation, faster than the economy and faster than almost every other nation.**


The 2013 Budget is for infrastructure.
Allocation of the 2013 State Budget ($1,648 million US Dollars)
Infrastructure $783 million 48%
Governance $214 13%
Services $208 13%
Benefits $236 14%
Development $74 4%
Security $101 6%
Other $32 2%
Electricity $238
Roads $147
Tasi Mane $144
Executive $40
Education $139
Veterans $96
Economy $39
F-FDTL $41
Contingency $19
Legislative $29
Social security $39
Agriculture $35
PNTL $43
Other $13
Judicial $43
Housing $39
Water & Sanitation $40
Other Infrastruct. $124
Admin. $102
Health $69
Other Security $16
PDID/PDL/PDD $89
Other social protect. $62
Graphic by La'o Hamutuk based on 2013 State Budget Appropriations. March 2013


Except for oil, only the state grows.
What makes up Timor-Leste's GDP?
Each year is shown with two bars. The one on the right is a 5x magnification of the non-oil GDP shown in the lower (yellow) part of the left bar, showing major sectors.
Million US dollars per year (constant 2010 dollars)
Left bar and scale: total GDP
Oil sector
Non-oil sector
Right bar and scale: non-oil GDP
Other
Real Estate
Public administration
Trade & hospitality
Manufacturing
Construction
Agriculture
$5,000
$4,000
$3,000
$2,000
$1,000
$0
$1,000
$800
$600
$400
$200
$0
2006
2007
2008
2009
2010
2011
Graph by La'o Hamutuk based on RDTL GDS National Accounts 2000-2011. June 2013

## Signs of the "resource curse" (1)

- **Seeing money as the solution to every problem**
  It's easier to buy a scholarship than to build a university.
- **Spending without thinking**
  Real state expenditures grow more than 20% per year.
- **Lack of realistic long-term planning**
  The Strategic Development Plan is but a dream.
- **Import dependency**
  Timor-Leste has a billion-dollar non-oil trade deficit.
- **Inflation from little local productive capacity**
  Our productive economy cannot absorb the cash in circulation.

## Signs of the "resource curse" (2)

- **Ignoring non-oil development and revenues**
- **Acting as if the oil money will last forever**
  Bayu-Undan and Kitan will be dry by 2024.
- **Borrowing today, to repay tomorrow**
  TL will borrow $480 million in the next five years, often for projects with little chance of return, and much more after that.
- **Wealth goes mainly to the urban elite.**
  Most people won't benefit from highways, airports and oil facilities, but will feel the burden of loan repayments.
- **Petroleum sector "captures" decision-making.**
  Few creative ideas to develop agriculture, education, tourism, small industries …

## Reasons for this model

- To support prudent, evidence-based planning decision-making.
- TL’s finite oil wealth won’t last very long.
- Today, we depend on it for everything.
- To explore the effects of policy and uncontrollable changes.
- Take “engineering approach” – history, assumptions and causality, not correlations

## Sustainability is not a new idea in Timor-Leste

- 2004: Estimated Sustainable Income Petroleum Fund rule (front-loaded then, often violated)
- 2011: UNDP National Human Development Report
- 2009-2013: SDP, PPPs, Tasi Mane and other proposals mention but fail to implement it.
- 2011-now: MoF “Yellow Road” options, recently made public – but unlikely to be implemented.
- 2012: LH original “going for broke” model
- 2013: World Bank Country Strategy

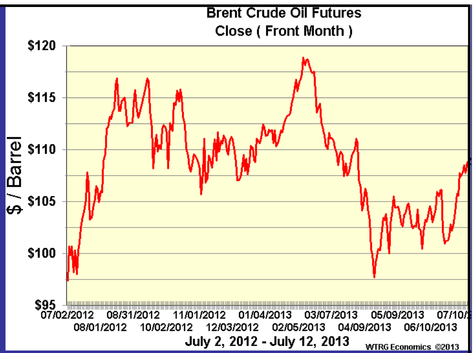
## What this model is and isn't

- Projects state revenues and expenditures based on current trends, external factors and future decisions
- Approximate, incremental and relative results, not precise predictions
- "Open source" – we welcome discussion and improvement
- Does not include economic predictions: no GDP, inflation, poverty or trade balance projections … or dubious correlations

## Outputs

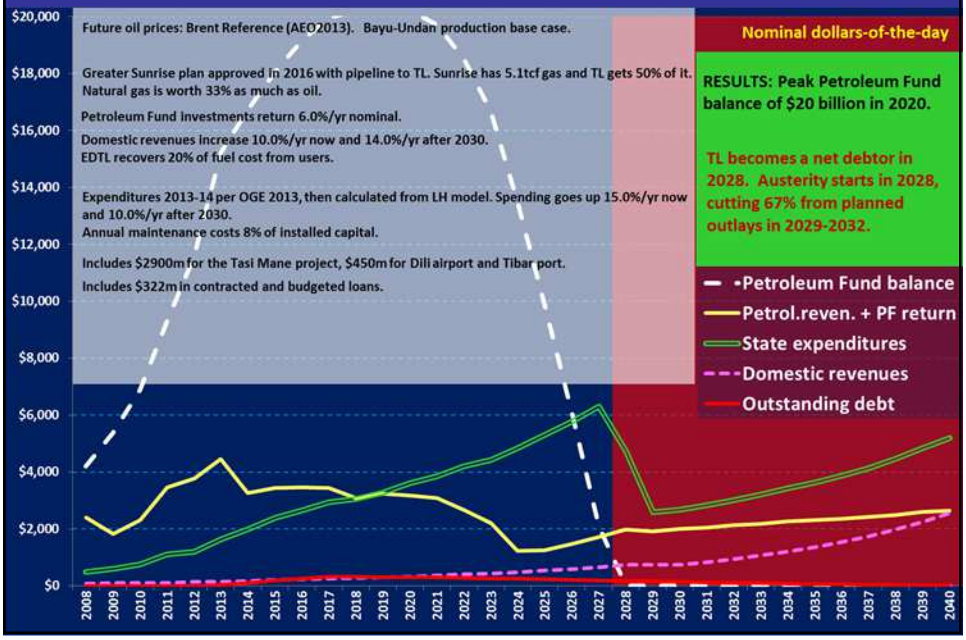
- Revenues and spending year-by-year
- Balance remaining in Petroleum Fund
- Balance owed from loans
- Not on graphs:
  - Estimated Sustainable Income
  - Breakdown of spending: recurrent (salaries, transfers, goods & services), debt service, O&M, minor and development capital
  - Breakdown of income: EDTL, loans, domestic taxes, oil revenues, Petroleum Fund return

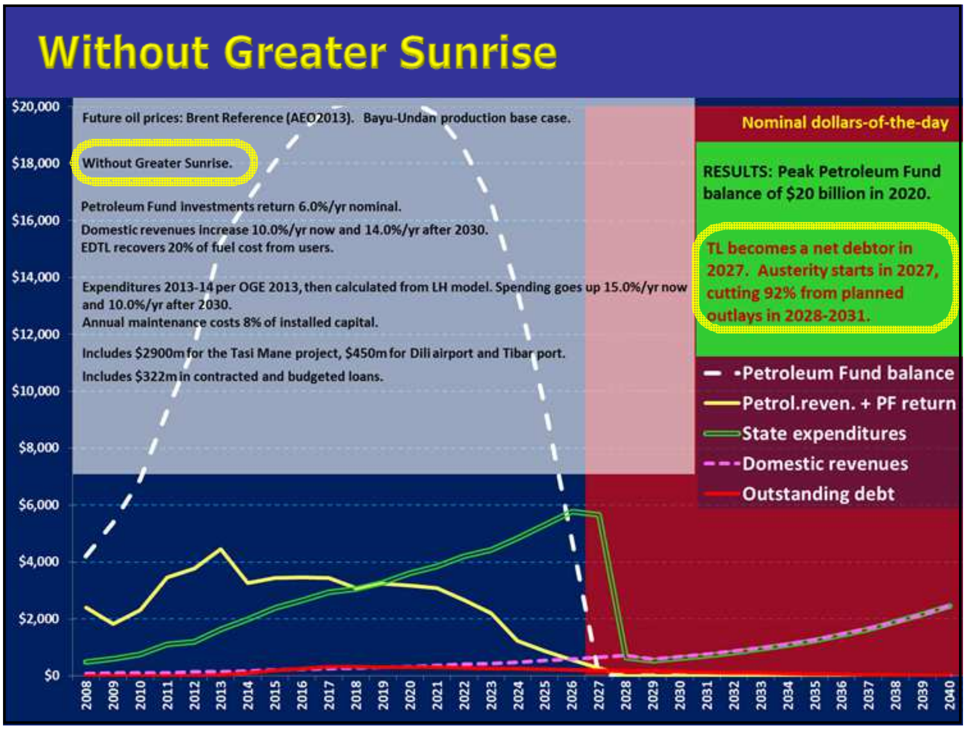
# Testable inputs

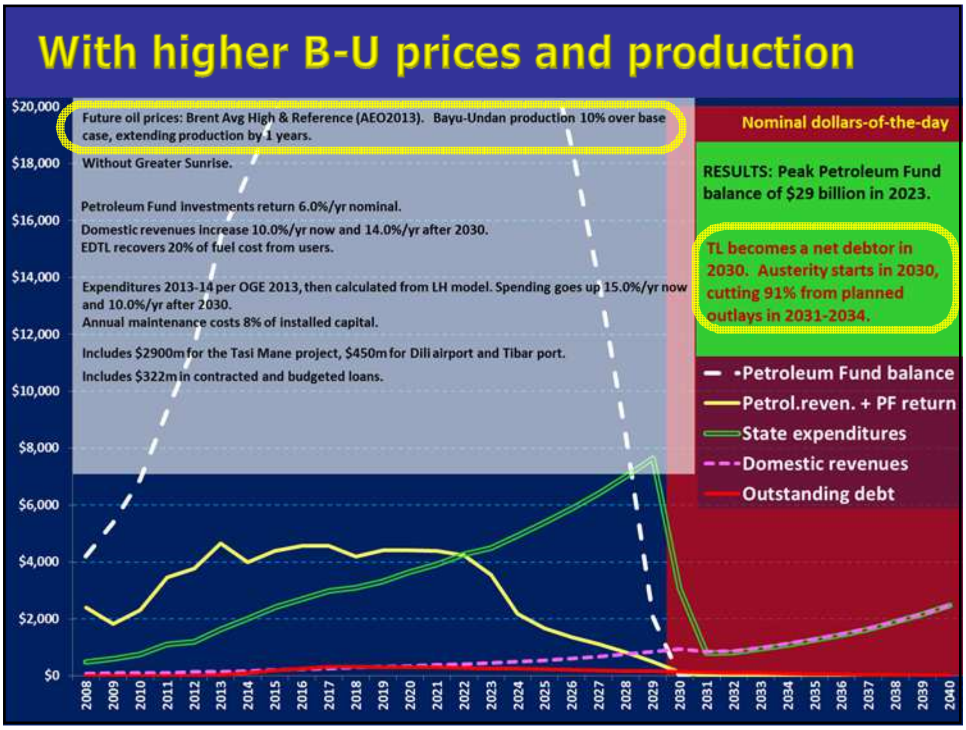


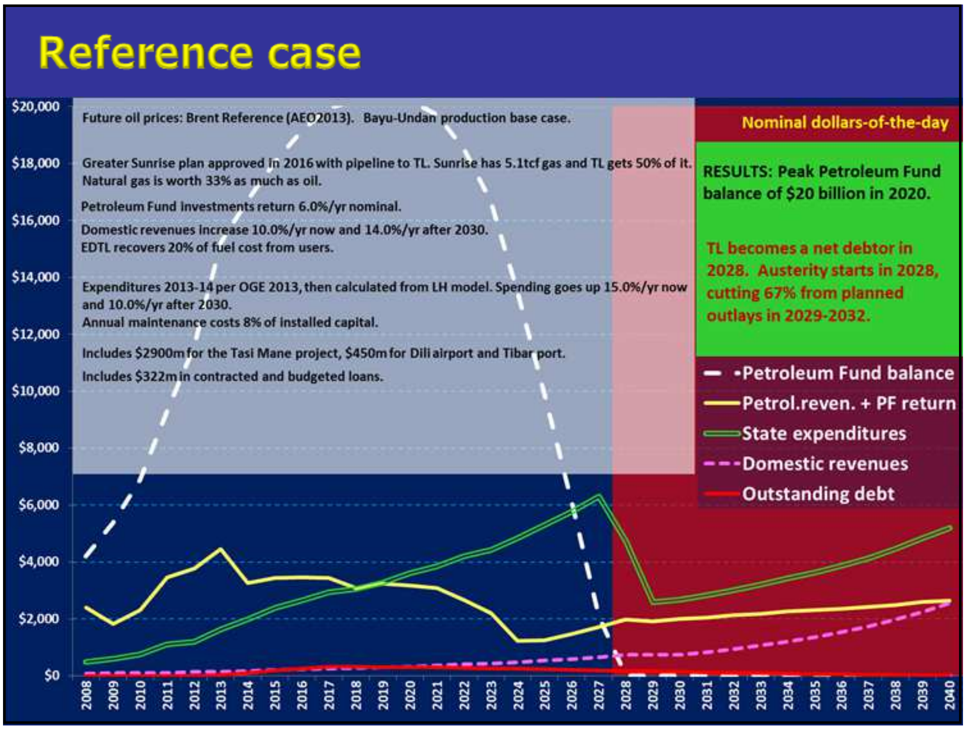

- **Global inflation, TL population, budgetary relationships**
- **Oil prices:** Brent or WTI; EIA price cases; gas/oil ratio
- **Production:** recoverable from Bayu-Undan and Sunrise
- **Greater Sunrise development:** if, when, where and revenue split
- **Return on Petroleum Fund investments**
- **Domestic revenues**, including recovery of EDTL fuel costs
- **Recurrent expenditure**, including maintenance of capital
- **Capital expenditure:** PPP and Tasi Mane components: if and amounts
- **Loans:** existing, planned and possible for projects and deficit, including amounts, interest and repayment periods
- **"Yellow Road" and other sustainable scenarios**

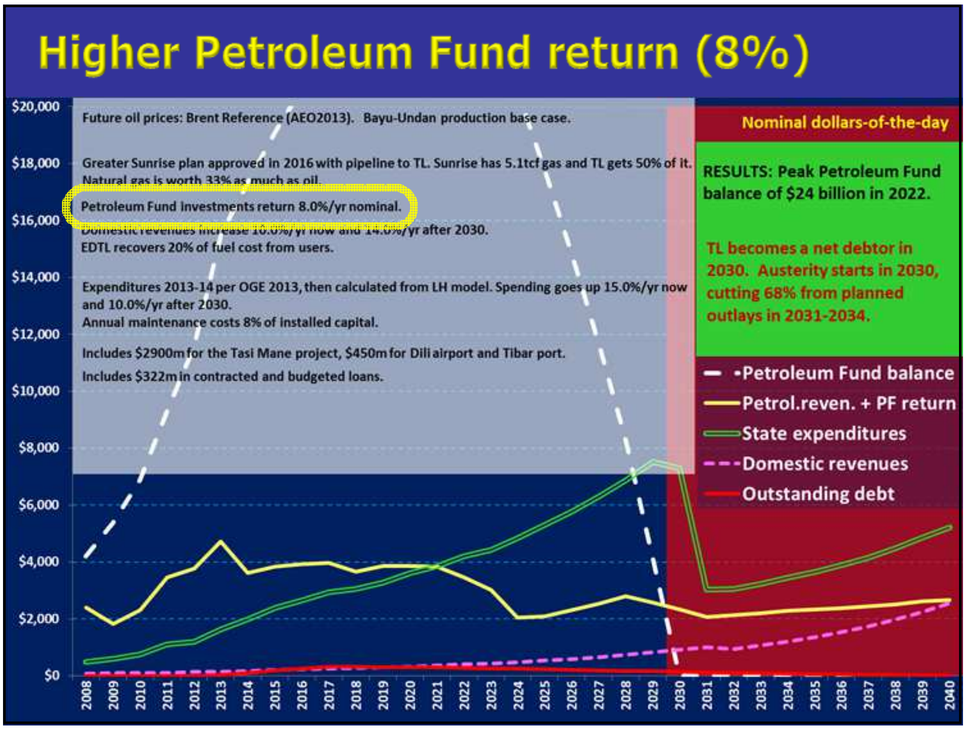
# Reference case (a bit optimistic)

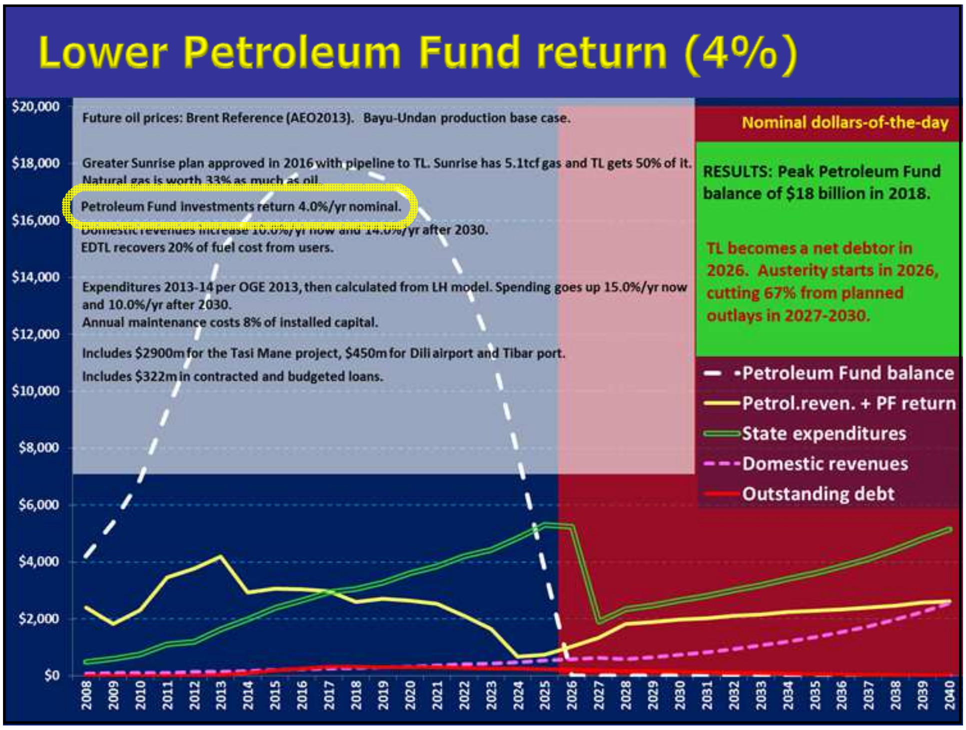


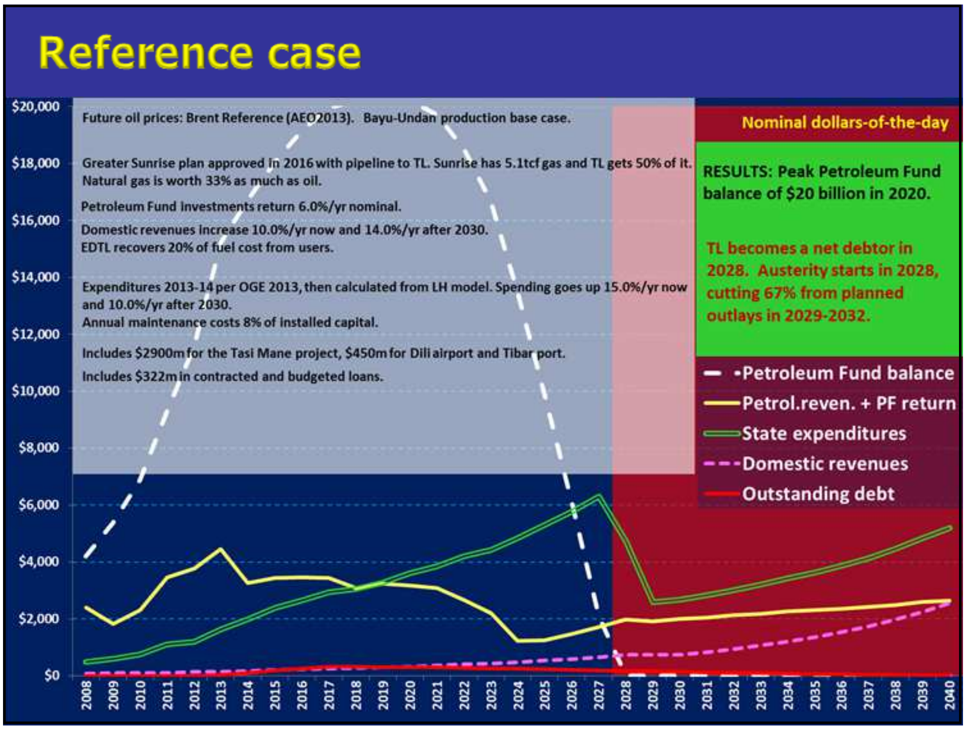

Without Greater Sunrise
Future oil prices: Brent Reference (AEO2013). Bayu-Undan production base case.
Without Greater Sunrise.
Petroleum Fund investments return 6.0%/yr nominal.
Domestic revenues increase 10.0%/yr now and 14.0%/yr after 2030.
EDTL recovers 20% of fuel cost from users.
Expenditures 2013-14 per OGE 2013, then calculated from LH model. Spending goes up 15.0%/yr now and 10.0%/yr after 2030.
Annual maintenance costs 8% of installed capital.
Includes $2900m for the Tasi Mane project, $450m for Dili airport and Tibar port.
Includes $322m in contracted and budgeted loans.
Nominal dollars-of-the-day
RESULTS: Peak Petroleum Fund balance of $20 billion in 2020.
TL becomes a net debtor in 2027. Austerity starts in 2027, cutting 92% from planned outlays in 2028-2031.
Petroleum Fund balance
Petrol.reven. + PF return
State expenditures
Domestic revenues
Outstanding debt

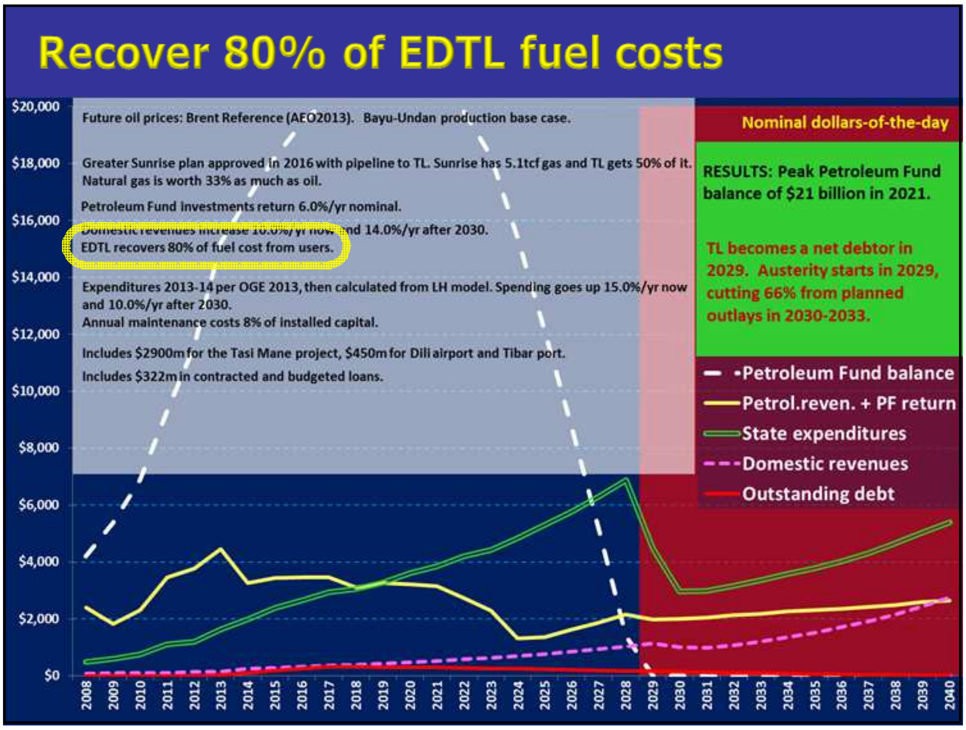

With higher B-U prices and production
Future oil prices: Brent Avg High & Reference (AEO2013). Bayu-Undan production 10% over base case, extending production by 1 years.
Without Greater Sunrise.
Petroleum Fund investments return 6.0%/yr nominal.
Domestic revenues increase 10.0%/yr now and 14.0%/yr after 2030.
EDTL recovers 20% of fuel cost from users.
Expenditures 2013-14 per OGE 2013, then calculated from LH model. Spending goes up 15.0%/yr now and 10.0%/yr after 2030.
Annual maintenance costs 8% of installed capital.
Includes $2900m for the Tasi Mane project, $450m for Dili airport and Tibar port.
Includes $322m in contracted and budgeted loans.
Nominal dollars-of-the-day
RESULTS: Peak Petroleum Fund balance of $29 billion in 2023.
TL becomes a net debtor in 2030. Austerity starts in 2030, cutting 91% from planned outlays in 2031-2034.
Petroleum Fund balance
Petrol.reven. + PF return
State expenditures
Domestic revenues
Outstanding debt

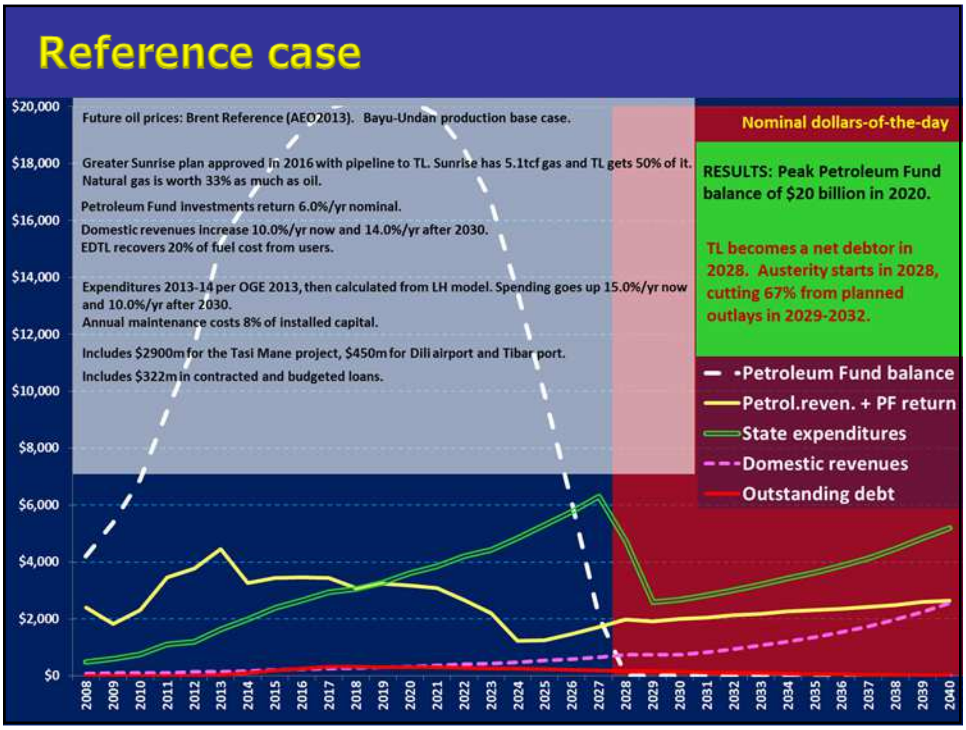

Reference case
Future oil prices: Brent Reference (AEO2013). Bayu-Undan production base case.
Greater Sunrise plan approved in 2016 with pipeline to TL. Sunrise has 5.1tcf gas and TL gets 50% of it. Natural gas is worth 33% as much as oil.
Petroleum Fund investments return 6.0%/yr nominal.
Domestic revenues increase 10.0%/yr now and 14.0%/yr after 2030.
EDTL recovers 20% of fuel cost from users.
Expenditures 2013-14 per OGE 2013, then calculated from LH model. Spending goes up 15.0%/yr now and 10.0%/yr after 2030.
Annual maintenance costs 8% of installed capital.
Includes $2900m for the Tasi Mane project, $450m for Dili airport and Tibar port.
Includes $322m in contracted and budgeted loans.
Nominal dollars-of-the-day
RESULTS: Peak Petroleum Fund balance of $20 billion in 2020.
TL becomes a net debtor in 2028. Austerity starts in 2028, cutting 67% from planned outlays in 2029-2032.
Petroleum Fund balance
Petrol.reven. + PF return
State expenditures
Domestic revenues
Outstanding debt
$20,000
$18,000
$16,000
$14,000
$12,000
$10,000
$8,000
$6,000
$4,000
$2,000
$0
2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040

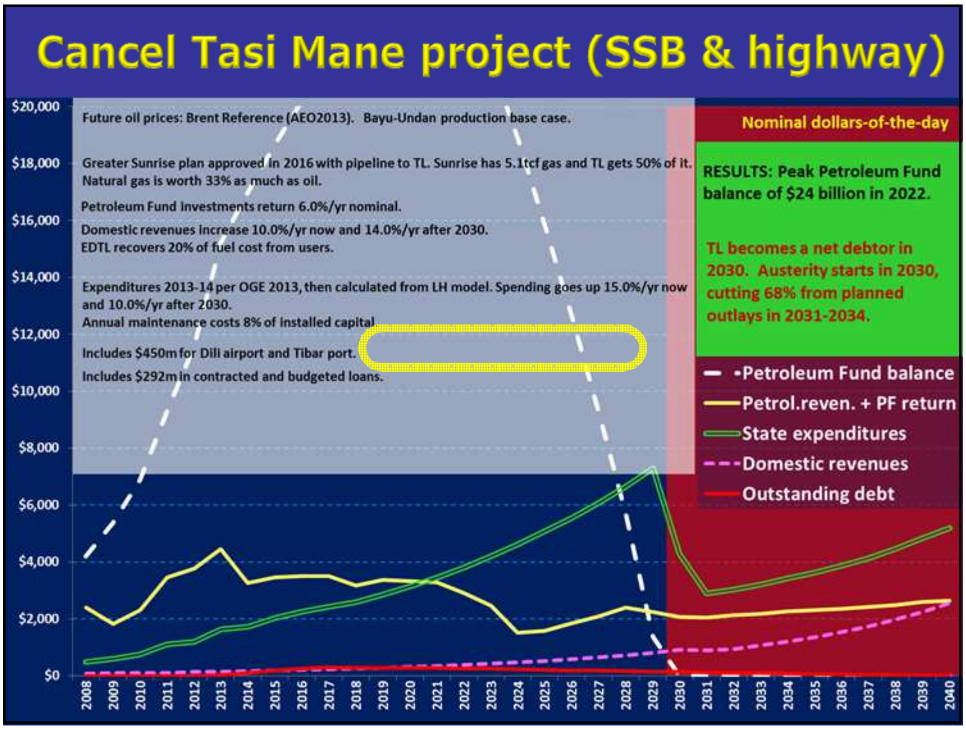

Higher Petroleum Fund return (8%)
Future oil prices: Brent Reference (AEO2013). Bayu-Undan production base case.
Greater Sunrise plan approved in 2016 with pipeline to TL. Sunrise has 5.1tcf gas and TL gets 50% of it.
Petroleum Fund investments return 8.0%/yr nominal.
/yr after 2030.
EDTL recovers 20% of fuel cost from users.
Expenditures 2013-14 per OGE 2013, then calculated from LH model. Spending goes up 15.0%/yr now and 10.0%/yr after 2030.
Annual maintenance costs 8% of installed capital.
Includes $2900m for the Tasi Mane project, $450m for Dili airport and Tibar port.
Includes $322m in contracted and budgeted loans.
Nominal dollars-of-the-day
RESULTS: Peak Petroleum Fund balance of $24 billion in 2022.
TL becomes a net debtor in 2030. Austerity starts in 2030, cutting 68% from planned outlays in 2031-2034.
Petroleum Fund balance
Petrol.reven. + PF return
State expenditures
Domestic revenues
Outstanding debt
$20,000
$18,000
$16,000
$14,000
$12,000
$10,000
$8,000
$6,000
$4,000
$2,000
$0
2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040

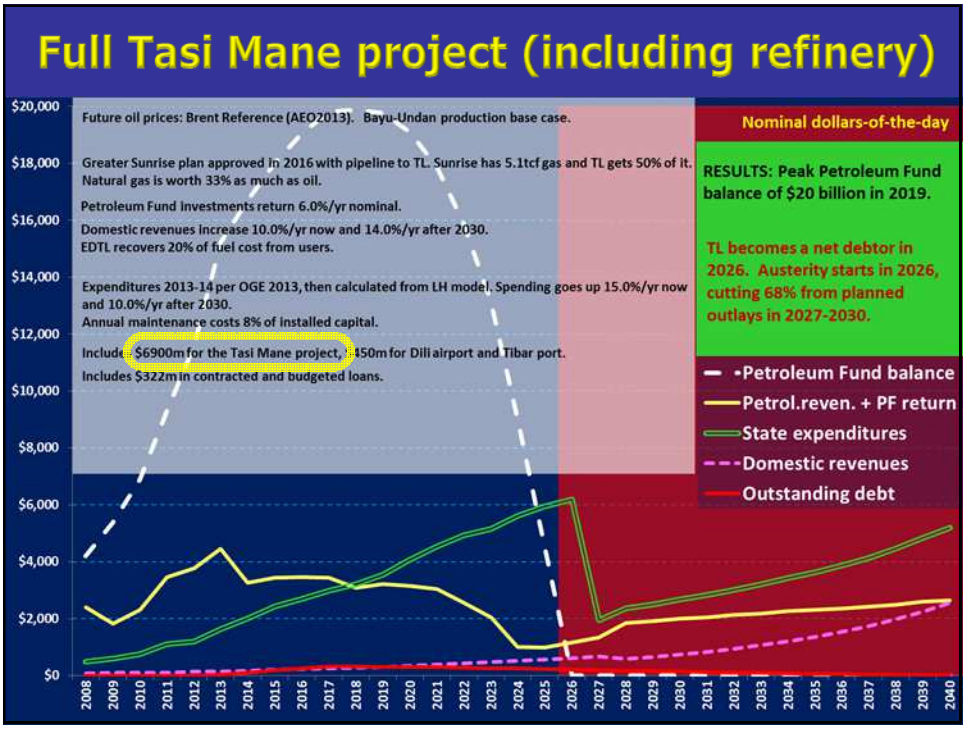

Lower Petroleum Fund return (4%)
Future oil prices: Brent Reference (AEO2013). Bayu-Undan production base case.
Greater Sunrise plan approved in 2016 with pipeline to TL. Sunrise has 5.1tcf gas and TL gets 50% of it. Natural gas is worth 33% as much as oil.
Petroleum Fund investments return 4.0%/yr nominal.
Domestic revenues increase 10.0%/yr now and 14.0%/yr after 2030.
EDTL recovers 20% of fuel cost from users.
Expenditures 2013-14 per OGE 2013, then calculated from LH model. Spending goes up 15.0%/yr now and 10.0%/yr after 2030.
Annual maintenance costs 8% of installed capital.
Includes $2900m for the Tasi Mane project, $450m for Dili airport and Tibar port.
Includes $322m in contracted and budgeted loans.
Nominal dollars-of-the-day
RESULTS: Peak Petroleum Fund balance of $18 billion in 2018.
TL becomes a net debtor in 2026. Austerity starts in 2026, cutting 67% from planned outlays in 2027-2030.
Petroleum Fund balance
Petrol.reven. + PF return
State expenditures
Domestic revenues
Outstanding debt
$20,000 $18,000 $16,000 $14,000 $12,000 $10,000 $8,000 $6,000 $4,000 $2,000 $0
2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040

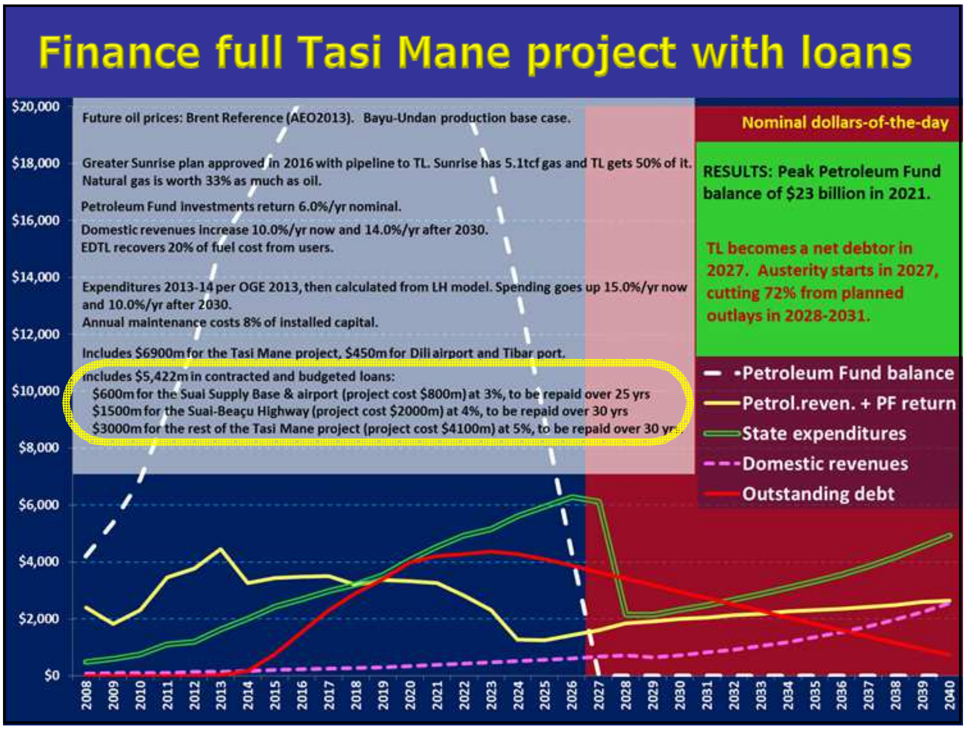

Reference case
Future oil prices: Brent Reference (AEO2013). Bayu-Undan production base case.
Greater Sunrise plan approved in 2016 with pipeline to TL. Sunrise has 5.1tcf gas and TL gets 50% of it. Natural gas is worth 33% as much as oil.
Petroleum Fund investments return 6.0%/yr nominal.
Domestic revenues increase 10.0%/yr now and 14.0%/yr after 2030.
EDTL recovers 20% of fuel cost from users.
Expenditures 2013-14 per OGE 2013, then calculated from LH model. Spending goes up 15.0%/yr now and 10.0%/yr after 2030.
Annual maintenance costs 8% of installed capital.
Includes $2900m for the Tasi Mane project, $450m for Dili airport and Tibar port.
Includes $322m in contracted and budgeted loans.
Nominal dollars-of-the-day
RESULTS: Peak Petroleum Fund balance of $20 billion in 2020.
TL becomes a net debtor in 2028. Austerity starts in 2028, cutting 67% from planned outlays in 2029-2032.
Petroleum Fund balance
Petrol.reven. + PF return
State expenditures
Domestic revenues
Outstanding debt
$20,000 $18,000 $16,000 $14,000 $12,000 $10,000 $8,000 $6,000 $4,000 $2,000 $0
2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040


Recover 80% of EDTL fuel costs
Future oil prices: Brent Reference (AEO2013). Bayu-Undan production base case.
Greater Sunrise plan approved in 2016 with pipeline to TL. Sunrise has 5.1tcf gas and TL gets 50% of it.
Natural gas is worth 33% as much as oil.
Petroleum Fund investments return 6.0%/yr nominal.
nd 14.0%/yr after 2030.
EDTL recovers 80% of fuel cost from users.
Expenditures 2013-14 per OGE 2013, then calculated from LH model. Spending goes up 15.0%/yr now and 10.0%/yr after 2030.
Annual maintenance costs 8% of installed capital.
Includes $2900m for the Tasi Mane project, $450m for Dili airport and Tibar port.
Includes $322m in contracted and budgeted loans.
Nominal dollars-of-the-day
RESULTS: Peak Petroleum Fund balance of $21 billion in 2021.
TL becomes a net debtor in 2029. Austerity starts in 2029, cutting 66% from planned outlays in 2030-2033.
Petroleum Fund balance
Petrol.reven. + PF return
State expenditures
Domestic revenues
Outstanding debt

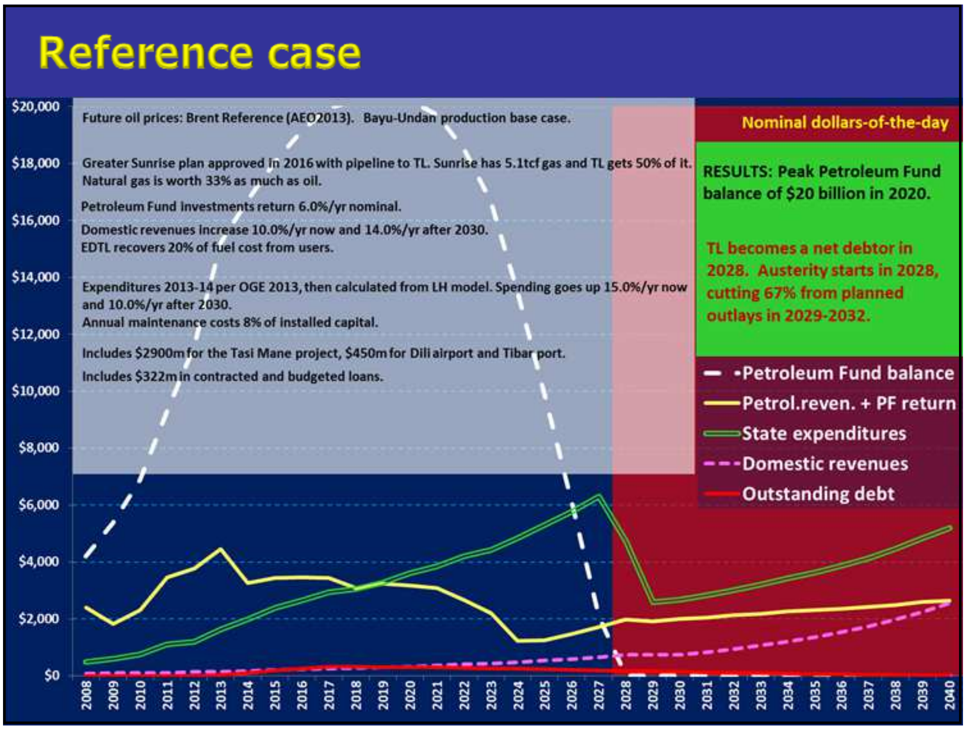

Reference case
Future oil prices: Brent Reference (AEO2013). Bayu-Undan production base case.
Greater Sunrise plan approved in 2016 with pipeline to TL. Sunrise has 5.1tcf gas and TL gets 50% of it.
Natural gas is worth 33% as much as oil.
Petroleum Fund investments return 6.0%/yr nominal.
Domestic revenues increase 10.0%/yr now and 14.0%/yr after 2030.
EDTL recovers 20% of fuel cost from users.
Expenditures 2013-14 per OGE 2013, then calculated from LH model. Spending goes up 15.0%/yr now and 10.0%/yr after 2030.
Annual maintenance costs 8% of installed capital.
Includes $2900m for the Tasi Mane project, $450m for Dili airport and Tibar port.
Includes $322m in contracted and budgeted loans.
Nominal dollars-of-the-day
RESULTS: Peak Petroleum Fund balance of $20 billion in 2020.
TL becomes a net debtor in 2028. Austerity starts in 2028, cutting 67% from planned outlays in 2029-2032.
Petroleum Fund balance
Petrol.reven. + PF return
State expenditures
Domestic revenues
Outstanding debt


Cancel Tasi Mane project (SSB & highway)
Future oil prices: Brent Reference (AEO2013). Bayu-Undan production base case.
Greater Sunrise plan approved in 2016 with pipeline to TL. Sunrise has 5.1tcf gas and TL gets 50% of it.
Natural gas is worth 33% as much as oil.
Petroleum Fund investments return 6.0%/yr nominal.
Domestic revenues increase 10.0%/yr now and 14.0%/yr after 2030.
EDTL recovers 20% of fuel cost from users.
Expenditures 2013-14 per OGE 2013, then calculated from LH model. Spending goes up 15.0%/yr now and 10.0%/yr after 2030.
Annual maintenance costs 8% of installed capital
Includes $450m for Dili airport and Tibar port.
Includes $292m in contracted and budgeted loans.
Nominal dollars-of-the-day
RESULTS: Peak Petroleum Fund balance of $24 billion in 2022.
TL becomes a net debtor in 2030. Austerity starts in 2030, cutting 68% from planned outlays in 2031-2034.
Petroleum Fund balance
Petrol.reven. + PF return
State expenditures
Domestic revenues
Outstanding debt
$20,000
$18,000
$16,000
$14,000
$12,000
$10,000
$8,000
$6,000
$4,000
$2,000
$0
2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040

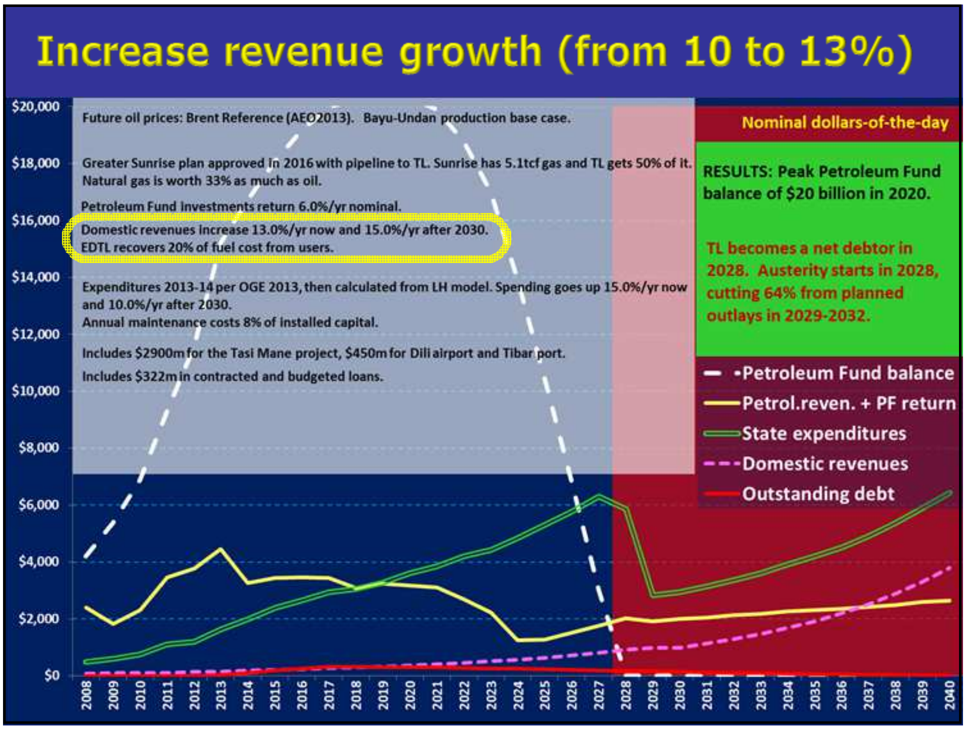

Full Tasi Mane project (including refinery)
Future oil prices: Brent Reference (AEO2013). Bayu-Undan production base case.
Greater Sunrise plan approved in 2016 with pipeline to TL. Sunrise has 5.1tcf gas and TL gets 50% of it.
Natural gas is worth 33% as much as oil.
Petroleum Fund investments return 6.0%/yr nominal.
Domestic revenues increase 10.0%/yr now and 14.0%/yr after 2030.
EDTL recovers 20% of fuel cost from users.
Expenditures 2013-14 per OGE 2013, then calculated from LH model. Spending goes up 15.0%/yr now and 10.0%/yr after 2030.
Annual maintenance costs 8% of installed capital.
Includes $6900m for the Tasi Mane project, $450m for Dili airport and Tibar port.
Includes $322m in contracted and budgeted loans.
Nominal dollars-of-the-day
RESULTS: Peak Petroleum Fund balance of $20 billion in 2019.
TL becomes a net debtor in 2026. Austerity starts in 2026, cutting 68% from planned outlays in 2027-2030.
Petroleum Fund balance
Petrol.reven. + PF return
State expenditures
Domestic revenues
Outstanding debt
$20,000
$18,000
$16,000
$14,000
$12,000
$10,000
$8,000
$6,000
$4,000
$2,000
$0
2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040

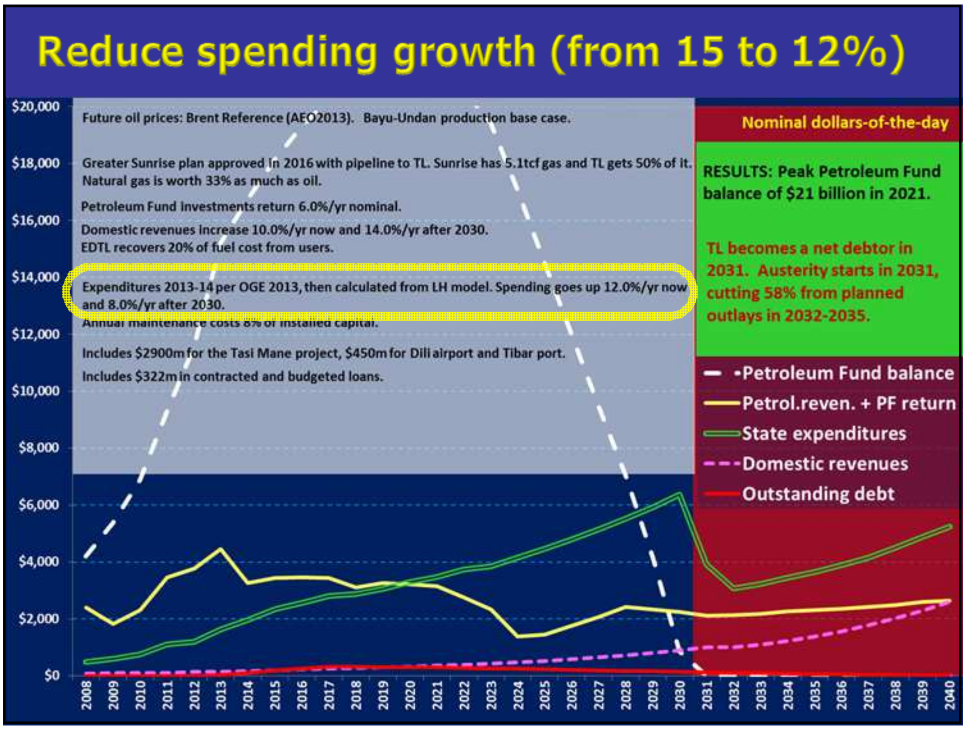


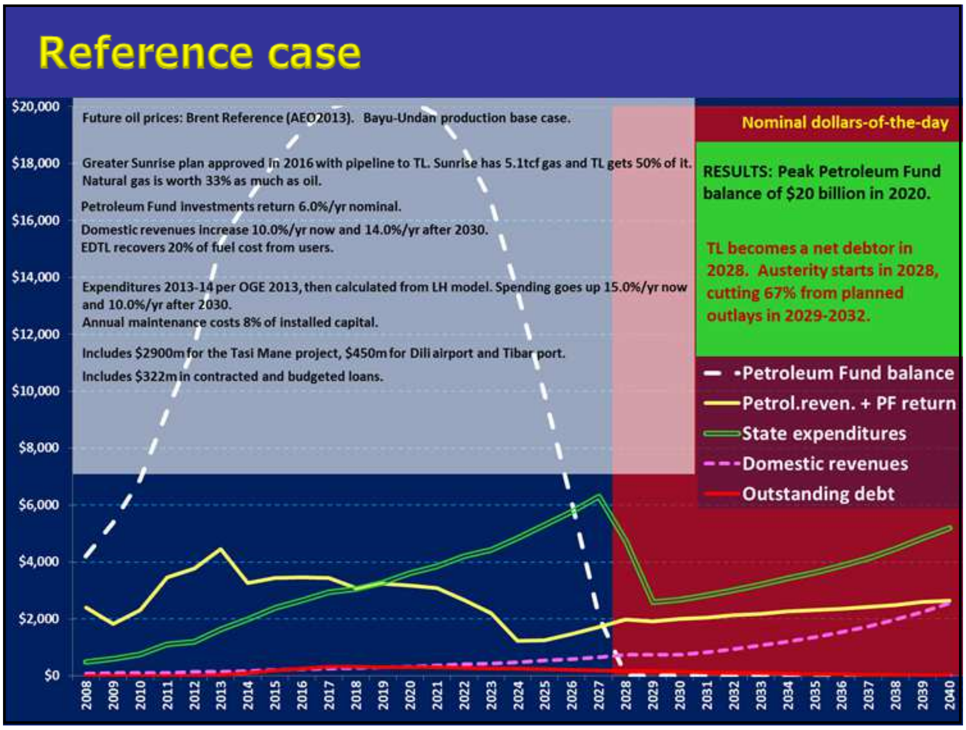
Finance full Tasi Mane project with loans
Future oil prices: Brent Reference (AEO2013). Bayu-Undan production base case.
Greater Sunrise plan approved in 2016 with pipeline to TL. Sunrise has 5.1tcf gas and TL gets 50% of it. Natural gas is worth 33% as much as oil.
Petroleum Fund investments return 6.0%/yr nominal.
Domestic revenues increase 10.0%/yr now and 14.0%/yr after 2030.
EDTL recovers 20% of fuel cost from users.
Expenditures 2013-14 per OGE 2013, then calculated from LH model. Spending goes up 15.0%/yr now and 10.0%/yr after 2030.
Annual maintenance costs 8% of installed capital.
Includes $6900m for the Tasi Mane project, $450m for Dili airport and Tibar port.
Includes $5,422m in contracted and budgeted loans:
$600m for the Suai Supply Base & airport (project cost $800m) at 3%, to be repaid over 25 yrs
$1500m for the Suai-Beaçu Highway (project cost $2000m) at 4%, to be repaid over 30 yrs
$3000m for the rest of the Tasi Mane project (project cost $4100m) at 5%, to be repaid over 30 yrs
Nominal dollars-of-the-day
RESULTS: Peak Petroleum Fund balance of $23 billion in 2021.
TL becomes a net debtor in 2027. Austerity starts in 2027, cutting 72% from planned outlays in 2028-2031.
Petroleum Fund balance
Petrol.reven. + PF return
State expenditures
Domestic revenues
Outstanding debt
$20,000
$18,000
$16,000
$14,000
$12,000
$10,000
$8,000
$6,000
$4,000
$2,000
$0
2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040

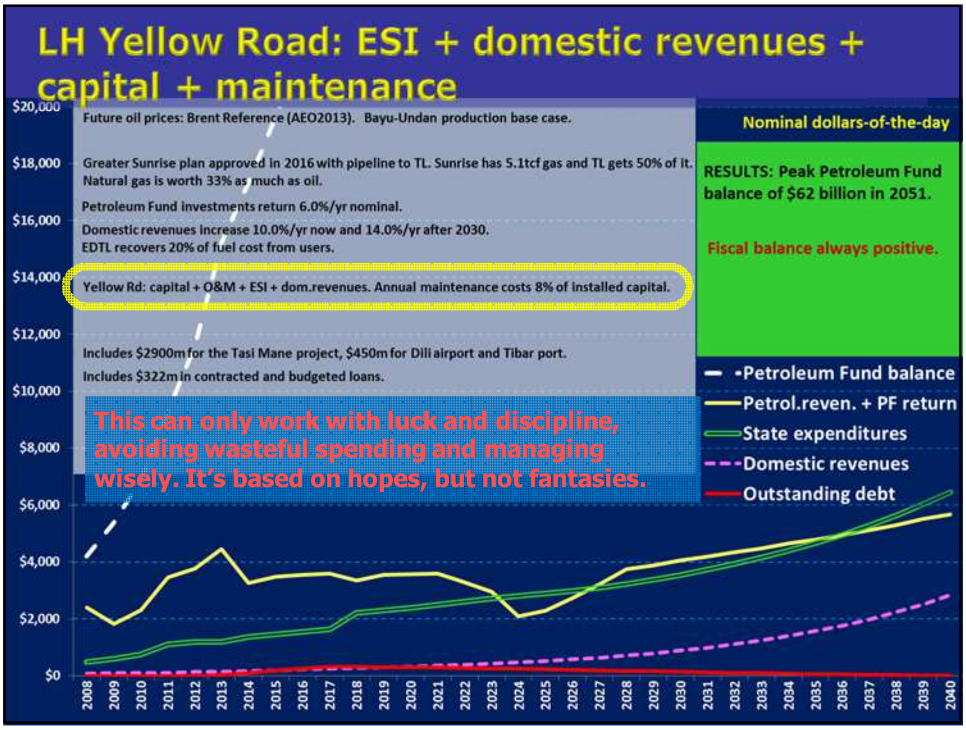
Reference case
Future oil prices: Brent Reference (AEO2013). Bayu-Undan production base case.
Greater Sunrise plan approved in 2016 with pipeline to TL. Sunrise has 5.1tcf gas and TL gets 50% of it. Natural gas is worth 33% as much as oil.
Petroleum Fund investments return 6.0%/yr nominal.
Domestic revenues increase 10.0%/yr now and 14.0%/yr after 2030.
EDTL recovers 20% of fuel cost from users.
Expenditures 2013-14 per OGE 2013, then calculated from LH model. Spending goes up 15.0%/yr now and 10.0%/yr after 2030.
Annual maintenance costs 8% of installed capital.
Includes $2900m for the Tasi Mane project, $450m for Dili airport and Tibar port.
Includes $322m in contracted and budgeted loans.
Nominal dollars-of-the-day
RESULTS: Peak Petroleum Fund balance of $20 billion in 2020.
TL becomes a net debtor in 2028. Austerity starts in 2028, cutting 67% from planned outlays in 2029-2032.
Petroleum Fund balance
Petrol.reven. + PF return
State expenditures
Domestic revenues
Outstanding debt
$20,000
$18,000
$16,000
$14,000
$12,000
$10,000
$8,000
$6,000
$4,000
$2,000
$0
2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040


Increase revenue growth (from 10 to 13%)
Future oil prices: Brent Reference (AEO2013). Bayu-Undan production base case.
Greater Sunrise plan approved in 2016 with pipeline to TL. Sunrise has 5.1tcf gas and TL gets 50% of it. Natural gas is worth 33% as much as oil.
Petroleum Fund investments return 6.0%/yr nominal.
Domestic revenues increase 13.0%/yr now and 15.0%/yr after 2030. EDTL recovers 20% of fuel cost from users.
Expenditures 2013-14 per OGE 2013, then calculated from LH model. Spending goes up 15.0%/yr now and 10.0%/yr after 2030.
Annual maintenance costs 8% of installed capital.
Includes $2900m for the Tasi Mane project, $450m for Dili airport and Tibar port.
Includes $322m in contracted and budgeted loans.
Nominal dollars-of-the-day
RESULTS: Peak Petroleum Fund balance of $20 billion in 2020.
TL becomes a net debtor in 2028. Austerity starts in 2028, cutting 64% from planned outlays in 2029-2032.
Petroleum Fund balance
Petrol.reven. + PF return
State expenditures
Domestic revenues
Outstanding debt
$20,000
$18,000
$16,000
$14,000
$12,000
$10,000
$8,000
$6,000
$4,000
$2,000
$0
2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040

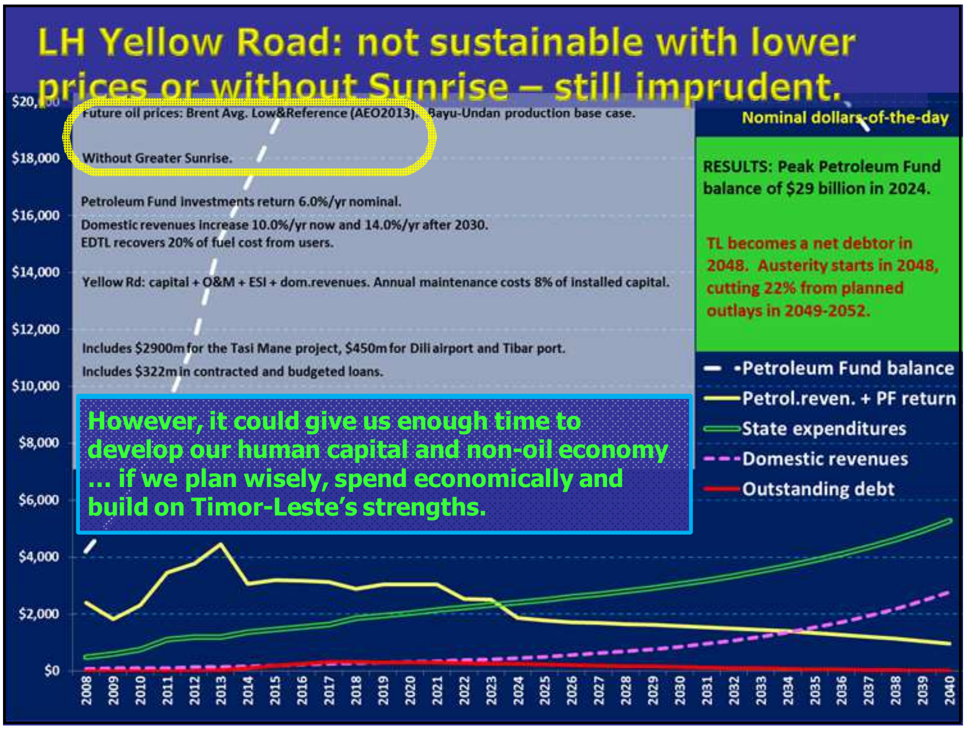

Reduce spending growth (from 15 to 12%)
Future oil prices: Brent Reference (AEO2013). Bayu-Undan production base case.
Greater Sunrise plan approved in 2016 with pipeline to TL. Sunrise has 5.1tcf gas and TL gets 50% of it. Natural gas is worth 33% as much as oil.
Petroleum Fund investments return 6.0%/yr nominal.
Domestic revenues increase 10.0%/yr now and 14.0%/yr after 2030. EDTL recovers 20% of fuel cost from users.
Expenditures 2013-14 per OGE 2013, then calculated from LH model. Spending goes up 12.0%/yr now and 8.0%/yr after 2030.
Annual maintenance costs 8% of installed capital.
Includes $2900m for the Tasi Mane project, $450m for Dili airport and Tibar port.
Includes $322m in contracted and budgeted loans.
Nominal dollars-of-the-day
RESULTS: Peak Petroleum Fund balance of $21 billion in 2021.
TL becomes a net debtor in 2031. Austerity starts in 2031, cutting 58% from planned outlays in 2032-2035.
Petroleum Fund balance
Petrol.reven. + PF return
State expenditures
Domestic revenues
Outstanding debt
$20,000
$18,000
$16,000
$14,000
$12,000
$10,000
$8,000
$6,000
$4,000
$2,000
$0
2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040


Reference case
$20,000
$18,000
$16,000
$14,000
$12,000
$10,000
$8,000
$6,000
$4,000
$2,000
$0
Future oil prices: Brent Reference (AEO2013). Bayu-Undan production base case.
Greater Sunrise plan approved in 2016 with pipeline to TL. Sunrise has 5.1tcf gas and TL gets 50% of it. Natural gas is worth 33% as much as oil.
Petroleum Fund investments return 6.0%/yr nominal.
Domestic revenues increase 10.0%/yr now and 14.0%/yr after 2030.
EDTL recovers 20% of fuel cost from users.
Expenditures 2013-14 per OGE 2013, then calculated from LH model. Spending goes up 15.0%/yr now and 10.0%/yr after 2030.
Annual maintenance costs 8% of installed capital.
Includes $2900m for the Tasi Mane project, $450m for Dili airport and Tibar port.
Includes $322m in contracted and budgeted loans.
Nominal dollars-of-the-day
RESULTS: Peak Petroleum Fund balance of $20 billion in 2020.
TL becomes a net debtor in 2028. Austerity starts in 2028, cutting 67% from planned outlays in 2029-2032.
Petroleum Fund balance
Petrol.reven. + PF return
State expenditures
Domestic revenues
Outstanding debt
2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040


MoF "Yellow Road" - impossible
$20,000
$18,000
$16,000
$14,000
$12,000
$10,000
$8,000
$6,000
$4,000
$2,000
$0
Future oil prices: Brent Reference (AEO2013). Bayu-Undan production base case.
Greater Sunrise plan approved in 2016 with pipeline to TL. Sunrise has 5.1tcf gas and TL gets 50% of it. Natural gas is worth 33% as much as oil.
Petroleum Fund investments return 6.0%/yr nominal.
Domestic revenues increase 10.0%/yr now and 14.0%/yr after 2030.
EDTL recovers 20% of fuel cost from users.
Yellow Rd: MoF sustainable expenditure.
Includes $2900m for the Tasi Mane project, $450m for Dili airport and Tibar port.
Includes $322m in contracted and budgeted loans.
Nominal dollars-of-the-day
RESULTS: Peak Petroleum Fund balance of $632 billion in 2066.
Fiscal balance always positive.
Petroleum Fund balance
Petrol.reven. + PF return
State expenditures
Domestic revenues
Outstanding debt
2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040



LH Yellow Road: ESI + domestic revenues + capital + maintenance
Future oil prices: Brent Reference (AEO2013). Bayu-Undan production base case.
Greater Sunrise plan approved in 2016 with pipeline to TL. Sunrise has 5.1tcf gas and TL gets 50% of it. Natural gas is worth 33% as much as oil.
Petroleum Fund investments return 6.0%/yr nominal.
Domestic revenues increase 10.0%/yr now and 14.0%/yr after 2030.
EDTL recovers 20% of fuel cost from users.
Yellow Rd: capital + O&M + ESI + dom.revenues. Annual maintenance costs 8% of installed capital.
Includes $2900m for the Tasi Mane project, $450m for Dili airport and Tibar port.
Includes $322m in contracted and budgeted loans.
This can only work with luck and discipline, avoiding wasteful spending and managing wisely. It's based on hopes, but not fantasies.
Nominal dollars-of-the-day
RESULTS: Peak Petroleum Fund balance of $62 billion in 2051.
Fiscal balance always positive.
Petroleum Fund balance
Petrol.reven. + PF return
State expenditures
Domestic revenues
Outstanding debt

LH Yellow Road: not sustainable with lower prices or without Sunrise – still imprudent.
Future oil prices: Brent Avg. Low&Reference (AEO2013). Bayu-Undan production base case.
Without Greater Sunrise.
Petroleum Fund investments return 6.0%/yr nominal.
Domestic revenues increase 10.0%/yr now and 14.0%/yr after 2030.
EDTL recovers 20% of fuel cost from users.
Yellow Rd: capital + O&M + ESI + dom.revenues. Annual maintenance costs 8% of installed capital.
Includes $2900m for the Tasi Mane project, $450m for Dili airport and Tibar port.
Includes $322m in contracted and budgeted loans.
However, it could give us enough time to develop our human capital and non-oil economy ... if we plan wisely, spend economically and build on Timor-Leste's strengths.
Nominal dollars-of-the-day
RESULTS: Peak Petroleum Fund balance of $29 billion in 2024.
TL becomes a net debtor in 2048. Austerity starts in 2048, cutting 22% from planned outlays in 2049-2052.
Petroleum Fund balance
Petrol.reven. + PF return
State expenditures
Domestic revenues
Outstanding debt

## Still to explore

- Other capital investment
- More refined recurrent cost projections, including pensions
- Possible future oil discoveries
- Links between human & physical investment and revenue growth
- Baby boom population dynamics
- Impacts of local inflation

## Thank you.

La’o Hamutuk will hold an in-depth workshop on this model next week. Check our blog for details.

You can find more and updated information at

- La’o Hamutuk website http://www.laohamutuk.org
- La’o Hamutuk blog http://laohamutuk.blogspot.com/
- Reference DVD-ROM available from our office.

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