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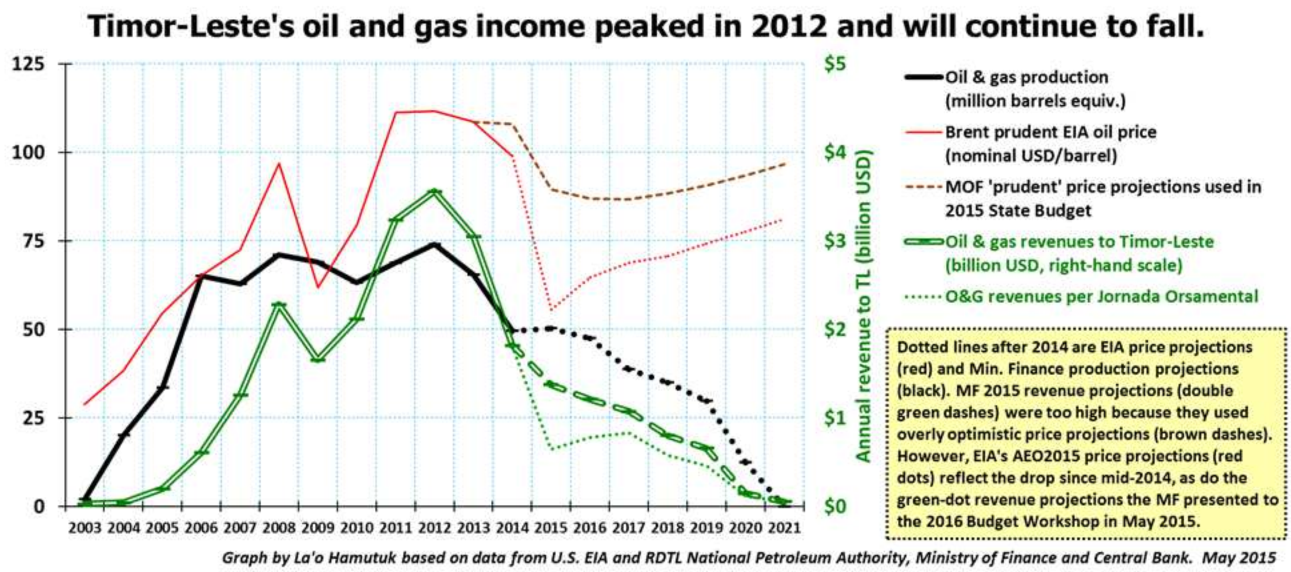
Update: How Long Will Timor-Leste's Petroleum Fund Last?

2 June 2015

This short paper describes La'o Hamutuk's projections of the lifespan of Timor-Leste's Petroleum Fund, which were summarized in our 15 April 2015 paper *Timor-Leste's oil and gas are going fast.*[1] It updates the baseline scenario from La'o Hamutuk's Sustainability Model, which was last published a year ago.[2] Since that time, world oil market prices and Timor-Leste state spending have both dropped, with effects which approximately cancel each other out, so the overall conclusion – that the Petroleum Fund may be entirely empty in about a decade – is still true.

After we published our April paper, the U.S. Energy Information Administration (EIA) released its *Annual Energy Outlook*, with updated projections for oil prices through 2040. Timor-Leste's Ministry of Finance used these projections to revise its expectations of Timor-Leste's oil and gas revenues, which were shared at their *Jornada Orçamental* budget workshop on 14 May 2015.[3] The following is a revised version of the first graph in La'o Hamutuk's April paper, showing the Ministry's new revenue estimates.



Timor-Leste's Petroleum Fund currently funds about 90% of the state budget, but its $17 billion dollars will not last very long after 2020, when the Kitan and Bayu-Undan oil and gas reserves will be used up. La'o Hamutuk's Sustainability Model synthesizes information about government plans, oil revenue projections, and other revenues and expenditures to estimate how long the Petroleum Fund will continue to exist. Using realistic, moderate assumptions, the model shows that the Fund will only be able to support Timor-Leste for five to eight years after Bayu-Undan runs out … until about 2025.

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[1] http://www.laohamutuk.org/Oil/curse/2015/OilGoingFast15Apr2015en.pdf

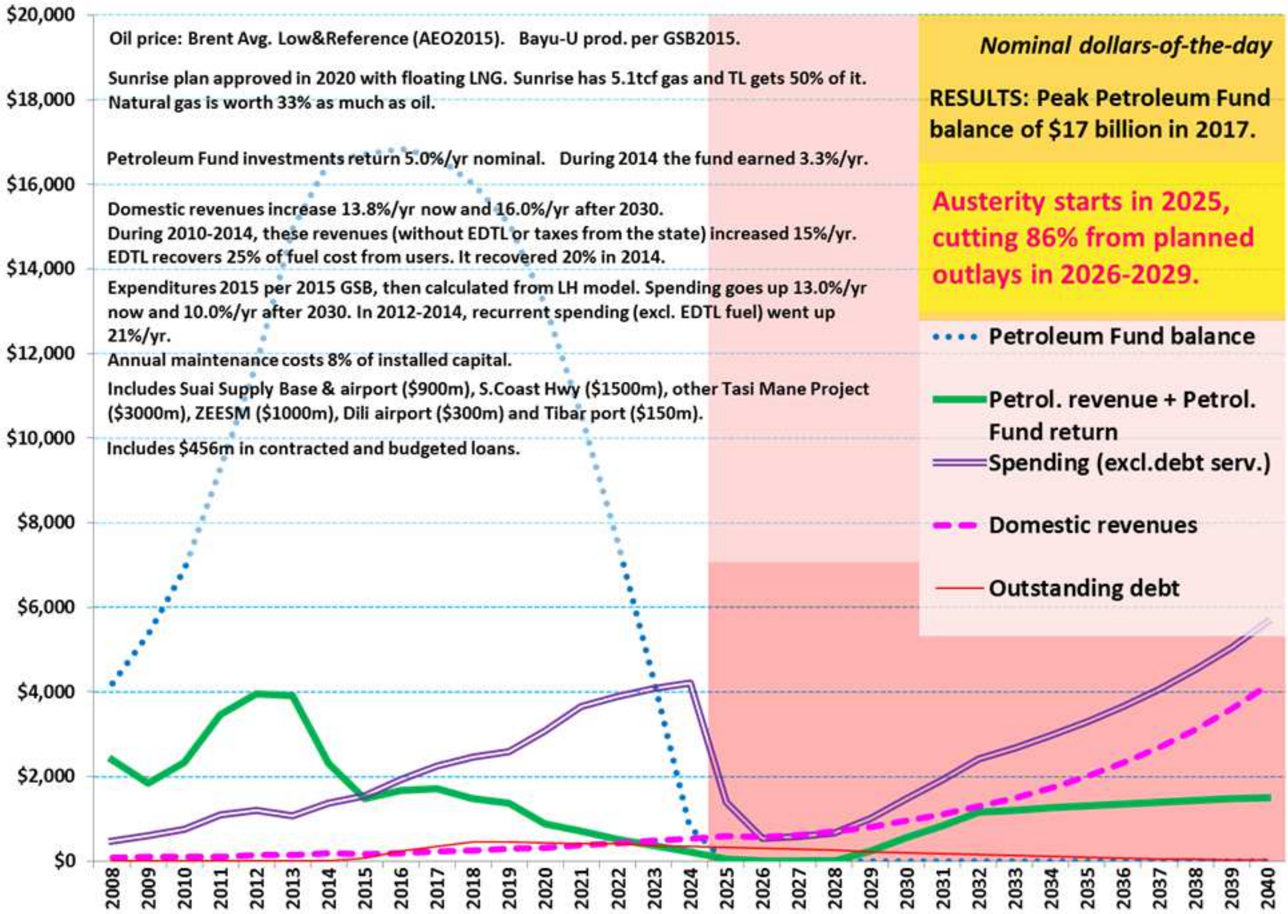
[2] An earlier version of this model is described at http://www.laohamutuk.org/econ/model/13PFSustainability.htm and in a February 2014 paper published by the Timor-Leste Studies Association at http://www.tlstudies.org/pdfs/TLSA Conf 2013/Volume 2 individual papers/vol2_paper28.pdf

[3] The presentation by the Ministry of Finance at that workshop is at http://www.laohamutuk.org/econ/OGE16/yrw/JornadaOrsamental14May2015.pdf, with updated revenue projections on page 28. Although the Ministry has not yet updated its Estimated Sustainable Income, it calculates that the drop in oil prices during the second half of 2014 will reduce future revenues by about 35%, from USD $5.3 billion to $3.5 billion, without considering changes in the volume or costs of oil and gas production. This is consistent with the estimates in La'o Hamutuk's April 2015 paper.

Although this Update describes only one scenario, the Model can estimate outcomes from a variety of assumptions. The graph below is based on prudent assumptions for oil prices (the average of the EIA 2015 Annual Energy Outlook low and reference cases, the same as the Ministry of Finance uses) and Petroleum Fund investment return (5% nominal). However, it projects future state spending more realistically than the Ministry does by including estimates of total construction costs for large projects currently being planned, designed or built, as well as more plausible projections for recurrent spending.

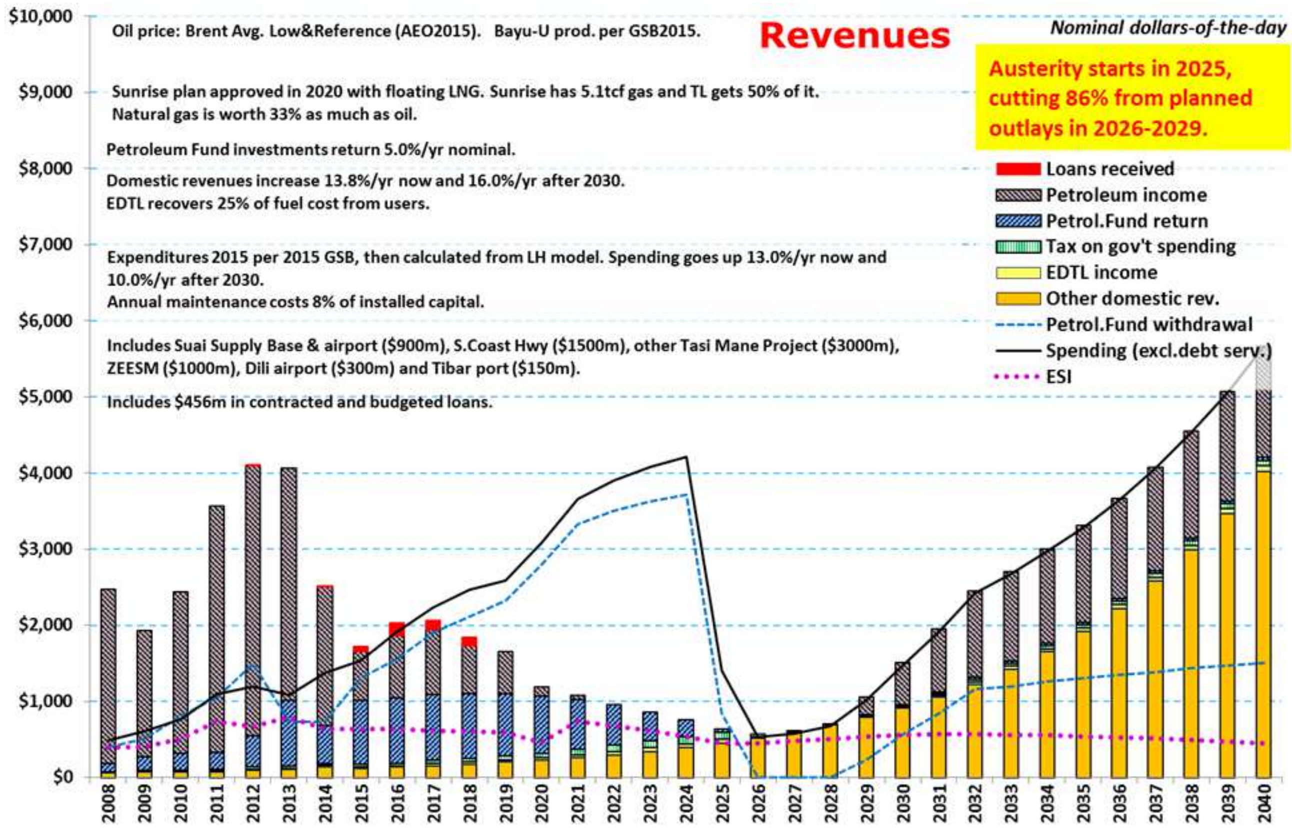
This scenario assumes that the Woodside-led Greater Sunrise Joint Venture, Timor-Leste and Australia are able to agree on a Sunrise development plan, and that the oil and gas field will be developed as the companies currently prefer (with a floating LNG plant) and according to the 2007 CMATS Treaty (with upstream revenues shared 50-50 with Australia). If this does not happen, oil revenues will not resume after 2029, and the growing state budget that the graph shows after that date will not be possible.

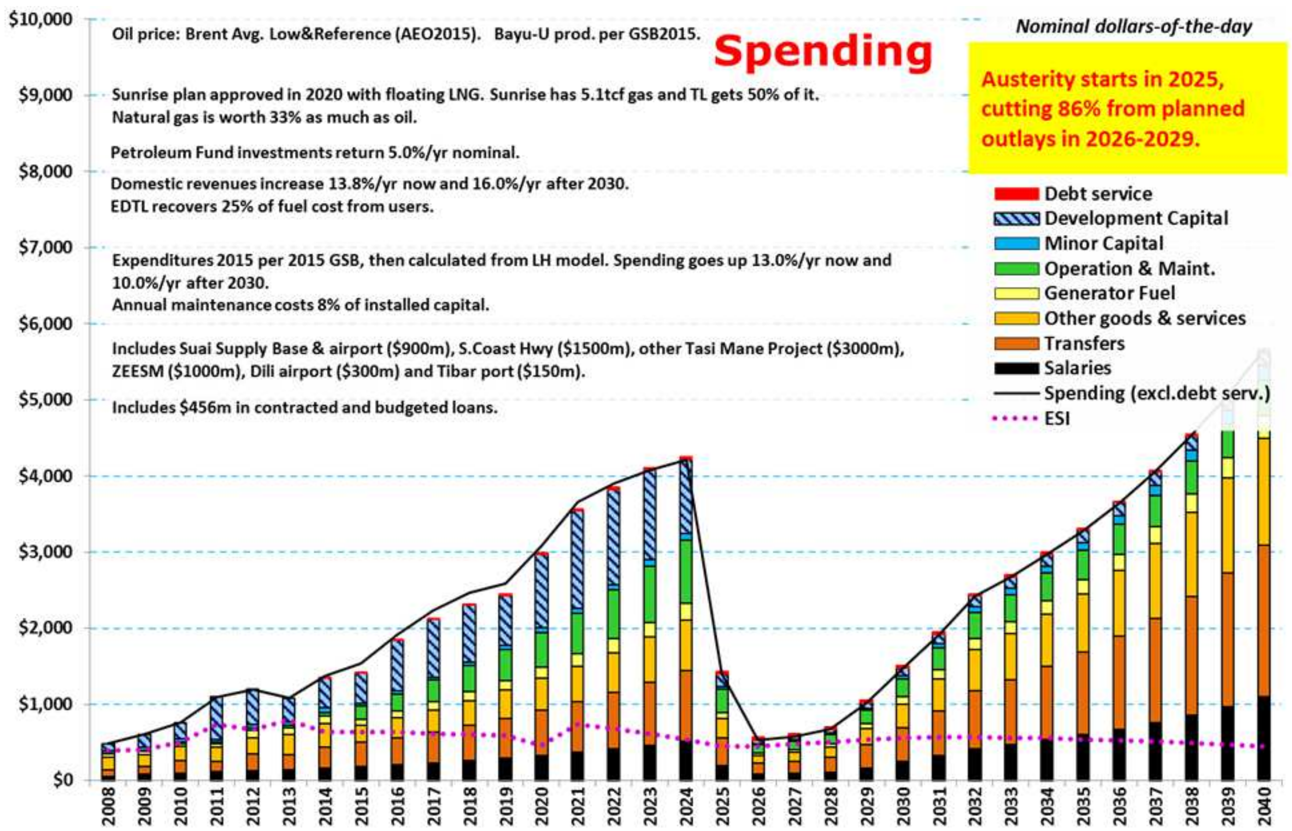
The scenario also makes the overly optimistic assumption that non-oil (domestic) revenues will increase 16% annually from 2030 on, which is probably unachievable even with radical reprioritization of the economy and tax laws, especially after the severe cutbacks required when the Petroleum Fund runs out. However, this factor does not significantly affect how long the Petroleum Fund will last.



Although Timor-Leste has been a sovereign nation for more than a decade, easy revenues from exporting nonrenewable oil and gas have financed the state despite the miniscule taxes from other sources. However, the neglect of economic diversification that this has enabled will have severe consequences within a decade, when the reserves and Petroleum Fund will be depleted. The results of this modeling, detailed in the graphs and tables that follow, underscore the urgency of reducing state spending and increasing non-oil economic activities, both to provide revenues and to produce food and necessities for Timor-Leste's people. The petroleum windfall opened a window of opportunity for Timor-Leste to develop a sustainable national economy, but it is closing fast.

If we drill down to explore revenues and expenditures in more detail, we see how much oil dominates state finances:





The spreadsheet model which generated these graphs is complex, not fully documented, and frequently updated, so we do not publish every version. However, La'o Hamutuk could make it available to those who would like to examine it in depth, or to test different assumptions and scenarios. The numbers underlying the preceding graphs follow. Figures are in millions of U.S. dollars-of-the-day, not adjusted for inflation. Petroleum income after 2028 and ESI after 2020 include the Greater Sunrise field (gray).

	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
Petroleum income	2284	1660	2117	3240	3559	3042	1817	643	819	856	631	552	118	56	0	0	0	0	0	0	0	232	546	822	1136	1170	1232	1270	1316	1352	1404	1433	1466
Return on Petroleum Fund investments	115	177	221	221	401	865	502	843	856	863	848	814	756	658	526	377	215	40	0	0	0	6	14	21	28	29	31	32	33	34	35	36	37
Petrol. revenue + Petrol. Fund return	**2399**	**1837**	**2338**	**3461**	**3960**	**3907**	**2319**	**1486**	**1675**	**1719**	**1479**	**1367**	**874**	**714**	**526**	**377**	**215**	**40**	**0**	**0**	**0**	**238**	**560**	**843**	**1164**	**1199**	**1263**	**1301**	**1349**	**1386**	**1439**	**1469**	**1503**
Pet.Fund withdrawal	396	512	811	1055	1495	730	732	1310	1560	1903	2113	2322	2798	3323	3502	3631	3712	839	0	0	0	238	560	843	1164	1199	1263	1301	1349	1386	1439	1469	1503
EDTL income	5	8	10	12	15	16	19	19	18	23	26	29	33	37	41	45	50	54	20	8	9	10	16	23	29	37	40	44	48	52	56	62	68
Tax on gov't spending	0	12	15	18	31	30	26	32	31	45	52	55	56	72	89	93	96	94	27	10	10	12	18	25	32	39	43	47	51	56	61	67	73
Other domestic rev.	65	71	72	75	96	104	140	120	136	155	176	200	228	261	299	342	392	449	517	596	687	791	912	1058	1227	1424	1651	1916	2222	2578	2990	3469	4023
Total domestic revenue	**70**	**91**	**96**	**105**	**142**	**151**	**184**	**170**	**186**	**223**	**255**	**285**	**316**	**369**	**429**	**481**	**538**	**596**	**564**	**614**	**706**	**814**	**945**	**1106**	**1288**	**1500**	**1734**	**2006**	**2321**	**2685**	**3107**	**3597**	**4165**
Loans received							6	60	172	115	102	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Generator fuel costs	36	38	40	44	102	95	94	72	91	104	115	131	147	164	182	198	216	81	32	35	41	63	91	118	147	160	175	190	208	226	248	272	299
Infrastructure oper-ation & maintenance	10	15	20	25	30	35	50	186	228	287	348	407	460	537	639	739	833	312	115	117	126	177	238	289	342	353	368	380	395	409	427	445	465
Other goods & services	175	160	186	184	210	260	319	228	258	291	329	372	420	470	527	590	661	254	102	115	137	213	315	419	539	605	684	769	866	975	1104	1246	1412
Salaries & benefits	50	87	92	112	131	142	162	178	201	227	256	289	327	366	410	459	515	198	79	89	107	166	245	326	420	471	533	599	675	759	859	970	1099
Public transfers	84	94	169	143	219	197	270	321	363	410	463	524	592	663	742	831	931	358	144	162	193	300	444	590	759	852	964	1083	1220	1374	1555	1755	1989
Total recurrent expenditures	**356**	**395**	**506**	**508**	**691**	**728**	**918**	**1118**	**1220**	**1439**	**1672**	**1883**	**2066**	**2321**	**2580**	**2818**	**3155**	**412**	**59**	**65**	**82**	**174**	**337**	**531**	**788**	**890**	**1020**	**1157**	**1319**	**1502**	**1731**	**1986**	**2297**
Minor capital	41	39	38	27	42	41	56	31	35	40	45	51	57	64	72	80	90	35	14	16	19	29	43	57	73	82	93	105	118	133	150	169	192
Development capital	87	171	216	561	462	312	394	391	662	758	745	659	961	1277	1249	1180	968	163	44	46	50	71	97	120	143	149	156	162	170	177	186	195	204
Total capital expend.	**128**	**210**	**254**	**588**	**504**	**352**	**450**	**422**	**697**	**798**	**790**	**709**	**1018**	**1341**	**1321**	**1260**	**1058**	**987**	**471**	**514**	**591**	**845**	**1136**	**1386**	**1634**	**1783**	**1952**	**2132**	**2332**	**2551**	**2798**	**3066**	**3363**
Debt service payment									1	4	8	14	30	30	30	34	36	36	35	34	33	33	32	31	30	26	25	19	19	18	18	15	8
Total expenditures	**484**	**604**	**760**	**1096**	**1195**	**1080**	**1368**	**1540**	**1917**	**2241**	**2470**	**2606**	**3114**	**3692**	**3931**	**4112**	**4250**	**1435**	**564**	**614**	**706**	**1051**	**1505**	**1949**	**2453**	**2699**	**2997**	**3307**	**3669**	**4071**	**4546**	**5067**	**5668**
Petroleum Fund end-of-year balance	4197	5377	6904	9310	11775	14952	16539	16716	16831	16647	16014	15059	13134	10526	7550	4297	799	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Outstanding debt							6	66	238	354	456	454	436	418	401	379	353	328	302	277	251	226	200	175	149	127	106	90	73	57	41	27	19
Brent crude price/bbl	$97	$62	$80	$111	$112	$109	$99	$56	$65	$69	$71	$74	$78	$81	$85	$88	$92	$96	$100	$104	$108	$112	$117	$122	$127	$132	$137	$143	$149	$155	$161	$168	$176
Est. Sustain. Income	396	408	502	734	665	787	632	639	633	615	598	587	457	739	679	610	534	452	453	479	506	535	557	569	572	564	554	542	528	512	494	474	452

The following list shows the contribution of a few very large projects to the "Development capital" expenditure line in the previous table. It only includes megaprojects which are discussed in the Government's Budget Books, although we have estimated the cost to build each entire project, not only the first few years shown in the Books.

This list does not include most roads, water supply, buildings, communications, future electricity or other investments, as these are done as multiple smaller projects.

We assume that private investors (or private sector PPP partners) will pay for at least half of the capital investment in the refinery, LNG plant, Dili airport and Tibar Port.

We expect that more megaprojects will be built than those currently planned and announced, but we have no data on them. Their omission significantly underestimates future capital spending. On the other hand, cancellation of future ZEESM and Tasi Mane Project spending (other than the Suai Supply Base) would prolong the life of the Petroleum Fund by two years and reduce the severity of subsequent austerity from 86% cuts from desired spending levels to 76%.

	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
ZEESM - Oecusse ($1 billion)							22	133	80	121	161	161	121	121	80																		
Electric system capital spending ($1.1 bn, mostly already spent)	10	11	90	429	284	81	77	47	23	2																							
Suai-Beaçu highway ($1.5 bn)				1	0	2	0	13	27	42	49	76	152	304	304	228	228	76															
Suai Supply Base Phase 1 & Suai airport ($0.9 bn)				2	13	2	25	33	205	317	226	77																					
Betano refinery ($0.9 bn, about one fourth of total cost)					3	2	1	1	5	5	25	50	151	151	151	151	151	50															
Beaçu LNG plant ($1.8 bn, about half of total cost)				6	6	2	3	0	1	0	11	22	219	437	437	437	219																
Other Tasi Mane project ($0.3 bn)								9	58	29	29	29	29	29	29	29	29																
Dili airport ($0.3 bn, about half total cost)								1	31	47	49	69	69	34																			
Tibar port ($0.15 bn, about half total cost)					1	2	1	2	21	18	53	26	26																				
Total megaprojects	**10**	**11**	**90**	**438**	**307**	**91**	**129**	**239**	**451**	**581**	**603**	**510**	**767**	**1076**	**1001**	**845**	**627**	**126**															