

Tonga Power Limited Matatoa, Taufa'ahau Road, Poutaha, Nuku'alofa 21400 www.tongapower.to

29th March 2020

Kilisimasi Ma'asi Electricity Commission Tu'atakilangi Nuku'alofa Tonga

Dear Sir,

Re: TPL Response to EC Comments Received 21st May 2020

Tonga Power Limited is pleased to submit its comments and supporting documents as part of the Regulatory Reset Proposal based on the comments and information request received.

The main document is named "TPL Response to Electricity Commission_290520".

A full set of documents are provided to the Commission electronically by way of a repository via Drop Box for ease of access to the documents.

Please do not hesitate to contact Tonga Power Ltd should you have any further queries on the Comments. Looking forward to the teleconference call with the Independent Expert together with the Commission at your available time.

Yours Sincerely,

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Setitaia Pasivaka Chen Chief Executive Officer Tonga Power Limited

Electricity Commission Response to TPL Comments

Information request

In order to further inform TEC's decision-making process, we ask to provide the following information:

1. Reliability performance (SAIDI, CAIDI, SAIFI)

- Can you please provide the underlying data that was used to report the reliability indicators in the Progress Reports. For example, the underlying spreadsheets.
 - Please find attached Spreadsheet for your perusal "Reliability Graphs Master jan20 Provision to EC"
- What are the formulas/definitions used by TPL in the reporting of the indicators? For example, a specific document or international standard.
 - Please find attached "TPL Fault Recording Reference Manual"
 - Please find attached "Tonga Power KPI Presentation_Oct2013_Final"
 - Please find attached "IEEE-1366-Reliability-Indices-2-2019"
- Can you please explain why in your reported figures as well as mentioned targets (see Progress Reports), it does not hold that SAIDI = SAIFI x CAIDI, as per the standard definition of the indicators according to IEEE (IEEE, 13662012 - IEEE Guide for Electric Power Distribution Reliability Indices). For reference, I also attach this IEEE standard.
 - As provided in the documents attached, the KPI Reliability review conducted in 2013 still stands valid to the current best practice and IEEE standard. In principle the formulae calculation above has been followed, please see the snippet below taken from "Reliability Graphs Master jan20" spreadsheet.

	SAIDI Monthly Performance (Minutes)							CAID! Monthly Performance (Minutes)							SAIF) Monthly Performance						
Month	2012/15	2015/14	2016/17	2017/18	2018219	2019/20	Ments	2014/15	2015/16	2016/17	2017/18	2018/18	5019/20	Month	2214/18	2018/16	2016/17	2017/18	2018/18	2019/3	
tul	171.57	17.28	291.01	76.37	37.08	96.27	Jul.	106.45	12.78	356.49	100.51	26.93	298.54	ful.	1.61	1.35	0.787	0.741	1.35	0.30	
Aue	161.75	151.91	49.71	70.55	26.98	34.41	Aug	118.076	74.97	40.03	147.74	152.64	84.34	Aug	1.37	2,027	1.242	0.44	0.156	0.391	
540	167,93	98.08	23.68	45.14	21.05	89.45	Sep	95.56	44.54	130.3	90.26	36.55	68.56	Sep.	\$.76	2.202	0.158	0.469	0.554	1:22	
Oct:	83.7	54.7	53.59	66.69	2.74	50.267	Oct	74.58	22.74	141.27	123.83	9.388	126.14	Oct	1:12	2.405	0.345	0.507	0.268	6.38	
Nov	123.66	15.55	203.1	43.3	52.03	47.65	Nov	190,511	31.481	135.97	28.87	73.66	98.4	Nov	0.649	2.367	1.44	1.47	0.68	0.45	
Dec	28.04	9.56	159.32	148.9	18.53	0.587	Dec	43.97	165.29	1104.21	62.47	59.887	12.475	Dec	0.636	0.058	0.17	2.358	0.276	0.025	
Jan:	190.24	66.96	345.87	13.49	76.34	2.929	Jan .	36.24	22.85	331:74	115.66	227.51	53:773	tion	5.25	2.931	1.004	0.236	0.309	6,031	
Feb	77.52	100.53	61.56	87.43	87.86	1.000000	Enti	42.54	36.4	78.038	62.23	91.3		Feb	1.62	2,763	0.72	1.389	0.896	1	
Mar	10:12	626.23	185.63	51.68	289.30		Mar	53.29	420.09	224.07	53.97	382.57		Mor	0.304	3.323	0.78	0.95	0.727	1	
	26.04	44.28	17.11	70.39	188.62		Aor	35.09	76.12	25.48	116.7	47.56		-Apr	0.743	0.58	0.632	0.498	3.948	1	
har	51.1	47.39	151.75	9.05	4.41		May	34.75	257.8	80.29	120.499	14.401		May	1.47	0.141	1.813	0.036	0.274	l	
May	14.15	76.53	18.4	15.72	72.84		het	169.50	8.08	114.72	213.08	56.86		Jun	0.203	0.629	0.143	0.147	1.248		
Total	1125.32	1109	1560.73	738.71	877.64	321 563	Total	980.637	1246.061	2762.608	1235.819	1179.257	742.228	Total	16.937	18.776	9.234	9.241	10.686	2.804	

july 27,466667 august 172,94877 september 37,99639 extober 10,22,9881 november 67,137681 january 247,05502 february 96,058036 march 398,01976 april 47,776699 may 16,094991 june 58,365,365

- The Cumulative Total is what has been provided in the TEC Report and is the <u>summation</u> of the monthly SAIDI: SAIFI: CAIDI figures which are calculated during and over a pre-defined period of time whereas CAIDI represents the Average time required.
- TPL has provided the "IEEE-1366-Reliability-Indices-2-2019" presentation as supporting clarification that the formulae that SAIDI = SAIFI x CAIDI does not always hold due to the network complexity (Automation vs Manual)

- When calculating TPL Reliability, TPL recommends to calculate SAIDI First, then SAIFI
 then from there you calculate CAIDI Please refer to TPL Fault Recording Reference
 Manual pages 28 onwards.
- The IEEE-1366-Reliability-Indices-2-2019 presentation supports the above, as they have been represented in the formulae recommended.
- Insofar the definitions applied by TPL are not in line with IEEE 1366, are you willing to discuss
 options to do so in future?
 - As per the above information provided, TPL is complying with IEEE 1366. TPL is willing to discuss options on the reliability measures and targets to be benchmarked for P3. TPL notes the impacts of ongoing Network Upgrade for example, the NNUP which is expected to be completed 2023-2024. Consequently, it would not be appropriate to reduce the targets further because the expected number of planned and unplanned outages may increase with the construction of NNUP, and as a result targets might be difficult and impractical to achieve.

2. Investment

- As mentioned in your response you would provide background information on the investment plan of TPL. Can you please provide this information?
 - Please refer to the attached Business Plan
- Can you confirm that any investment which is financed through grants or similar sources (i.e. without bearing any interest or repayment obligation), is not included in the proposed investment plan?
 - TPL has excluded Grant-funded Capex
- Can you please provide a list of these above investments: type, date of construction, amount, financing source?
 - Please refer to the attached electronic zip files labeled "Distribution Investment Plans"

3. Fuel efficiency

- In your response document you mention on page 23: "Please refer to the calculation analysis (refer Appendix A)." It is not clear to what Appendix A you refer. Can you please provide these separately?
 - System loss Separate system loss from overproduction.
 - Please refer to the attached Appendix A: Fuel Efficiency

 As per the Progress Report January 2020 snippet below, it is noted that the "figures includes energy generated from Renewables"

3. DIESEL GENERATION FUEL EFFICIENCY

The Regulatory Addendum requires a weighted average for Tonga as a whole of not less than 4 kWh/litre and Tonga Power Limited has exceeded this target in the month of January 2020. The actual result for January 2020 is 4.63 kWh/litre, remaining generally stable as compared to last month. Ha'apai's fuel efficiency remained above target of 4.40 kWh/litre. Fuel efficiency for 'Eua was 3.57kWh/litre. Vava'u fuel efficiency was 4.46 kWh/litre (note this figure includes energy generated from Renewables). Fuel Efficiency (diesel only) for January 2020 for Tonga is 4.59 kWh/litre.

Appendix 2 hereto comprises bar graphs going back 12 months to show results for Tonga as a whole and each of the four separate island grids.

4. Parasitic losses

- In your response document you mention on page 27: "TPL would appreciate EC's endorsement
 of the calculation method Figure 1 and Table 7." It is not clear to what Figure/Table you refer.
 Can you please provide these separately?
 - Please refer to the attached Appendix A: Fuel Efficiency which contains Figure 1 and Table 7
- For the line losses, historical performance has in some cases been down to 5%. Can you please explain the wide variation in line losses.
 - It has been a combination of CT meter and three phase meter issues when combined with the read period being longer, and or shorter than other months.
- Can you please provide additional analysis on why 1.5% battery losses are appropriate? For example, did TPL conduct any simulations or load flow analysis?
 - Please refer to the Appendix A