ELECTRICITY COMMISSION

27th November 2014

Mr. John van Brink
Chief Executive
Tonga Power Limited
Nuku'alofa

Dear Mr. van Brink,

CONCESSION CONTRACT – RESET PREPARATIONS

1. We look forward to receiving Tonga Power's Reset Proposals prior to the 31st December 2014.

2. The provision of Paragraph 2.1(d) of Schedule 10 of the Concession Contract provide that in addition to the information which Tonga Power MUST provide in respect of the Reset, the Commission may request "any other additional information" which reasonably they consider ALSO should be provided.

3. In the Schedule annexed hereto is described the addition information which for the time being the Commission does require. We trust the provision of this necessary information will not be unduly burdensome to Tonga Power, and indeed that it may prove beneficial is achieving an appropriate outcome.

4. As always, I am available to discuss with you any matter arising from this letter.

Yours sincerely,

ELECTRICITY COMMISSION
KINGDOM OF TONGA

Dalgety

Rt. Hon. Lord Dalgety QC
for the Electricity Commission

SCHEDULE / . . . . . .

Tu'atākilangi P. O. Box 47 Nuku'alofa Kingdom of Tonga (South Pacific)
Tel : (676) 23.632 E.mail : chairman.regulator@gmail.com

SCHEDULE

ONE: DISTRIBUTED GENERATION

(1): For the avoidance of any doubt the Commission ("EC") considers that it would be prudent if Tonga Power Limited ("TPL") were to proffer a draft Distributed Generation Contract as part of their Reset proposals and for that draft (as approved after the Reset) to form an additional Schedule to the regulatory provisions of the Concession Contract arrangements for 2015-2020 (the "CC"). *(In this schedule an assumption to made that the second reset period will endure for five years).*

(2): Having Regard to the whole circumstances (including issues such as Grid Stability and Cost, both of a Capital and Revenue nature) does TPL consider that there is a minimum number of units of electricity (kWh) which must be made available to the Grid before a Distributed Generation arrangement should be entered into by them with any party? A reasoned explanation is requested.

(3): In the interests of absolute transparency TPL is requested to suggest, with reasons for their choice, the methodology they would propose for fixing the allowance to be given for power acquired from distributed generators, and advise the EC whether they would regard this merely as an Offset Charge (against power purchased from the Grid) or as a full two-way Net Billing Process? Again the EC considers it appropriate that the outcome of the deliberations on this matter are reflected in the CC.

(4): In respect of consumers themselves producing electricity and selling any surplus to the Grid (Distributed Generation) how, if at all, does TPL propose to ensure that such parties bear their fair share of TPL's Overhead Costs and Distribution Costs? This matter requires to be addressed as part of the Reset Tariff Review.

TWO: ECONOMIC BYPASS

How, if at all, does TPL propose to address the potential for economic bypass if there is a quantum increase in Self-Generation and Distributed Generation during the second reset period and, accordingly, a significant diminution in the electricity they are able to sell to Tongan power consumers? This matter requires to be addressed as part of the Reset Tariff Review.

THREE: NON-TARIFF CHARGES

At the present all TPL's non-tariff charges such as for:-

- Disconnection/ Reconnection;
- Customer cheques "Returned to Drawer" due to inadequacy of funds; and
- Connection Charges.

are strictly speaking unregulated. The EC considers this undesirable as not being in the best interests of consumers. Accordingly TPL is required to advise the EC what Non-Tariff Charges, if any, they are seeking for the period 2015-2020 and to provide evidence to justify the amount of each such charge which they are claiming. The outcome of these discussions will require to be incorporated into the CC.

FOUR: CAPITAL EXPENDITURE (CAPEX)

Because of the significant effect it could have on the Tariff paid by Tongan electricity consumers the EC require TPL in respect of their capital expenditure proposals for the second reset period (2015-2020) to provide, in respect of each project, two alternative costs:-

(a): where there is a significant Aid component; and

(b): where the whole cost requires to be borne by TPL.

The tariff implications of these alternatives should be addressed by TPL in their Reset proposals.

In addition the EC invite TPL to prioritise their capital expenditure projects and to explain the rationale behind their priority rating.

FIVE: STAFFING

(1): The EC wish TPL to provide details in respect of financial years 2011-2012, 2012-2013, 2013-2014 and each year of the Second Reset Period of their total Personel Costs (inclusive of Salaries, Pension Payments, Insurance Arrangements and Allowances, etc.) in respect of Expatriate Staff: and to advise what arrangements, if any, they have for succession planning and training of local staff with the perceived future potential to replace expatriate staff.

For the avoidance of any doubt the EC wish to emphasise that they believe TPL must select the best qualified and experienced staff, even if foreigners. However arrangements ought to be put in place to augment the skills and experience of Tongans so that in due course they can compete for vacancies on an equal footing with overseas staff.

(2): What proposals, if any, does TPL have to increase the efficiency of each of the component profit (operating) centres of TPL, and the output of each staff member, all as measured against Standard International Indices – eg. Number of Staff per Km of the Distribution System?

SIX: OPERATING COSTS (OPEX)

(1): In respect of each financial year during the first reset period up to 30th June 2014, the EC wish TPL to recast their Statement of Financial Performance under the following headings:-

- Generation Fuel
- Generation Non Fuel
- Distribution
- Retail

(2): Retail should include such as Billing, Metering, Meter Reading, Connections and Disconnections, Customer Complaints. Distribution should include expenditure associated with Transmission and Distribution over High Voltage, Low Voltage and Service Lines. The Generation headings are self-explanatory.

(3): There remains an issue with certain Overheads which hitherto TPL have treated as a separate category and not allocated amongst Generation, Distribution and Retail. Such costs would include TPL Board Fees and Expenses and the Regulatory Fees paid to the EC. In the opinion of the EC although a total for each of such costs should continue as at present to be recorded in TPL's Audited Financial Statements, for Tariff Reset Purposes the EC require TPL to provide a formula for allocating these costs amongst Generation, Distribution and Retail.

(4): In accordance with the format set forth in **(1)** above TPL should also provide to the EC:-

- An estimate for financial year 2014-2015; and,
- Proposals for each of the five years of the Second Reset Period.

(5): The EC also wish to be assured by TPL that the "building blocks" to be used in calculating the Electricity Tariff going forward EXCLUDE all direct and indirect costs of TPL's unregulated activities (such as their Gas subsidiary).

SEVEN: REGULATORY INTENT

In presenting their Regulatory Proposals to the EC, TPL should have regard to the EC's paper entitled "Statement of Regulatory Intent in the matter of the Reset of the Electricity Tariff etc" and, in particular should address the FOUR QUESTIONS highlighted on page 3 thereof, namely:-

a. What must be done to ensure that Tongan Electricity Consumers receive a **continuous, safe and reliable supply of electricity?**

b. Are TPL's expenditure proposals, both CAPEX and OPEX, the most **efficient and effective** way of achieving such a continuous, safe and reliable supply of electricity?

c. Are cost-effective **Innovative Technologies** with a proven track-record being utilised?

d. PARAMOUNT QUESTION – How can the **Electricity Tariff** be kept as low as possible?

CEO 9. TPL

ELECTRICITY COMMISSION

STATEMENT OF REGULATORY INTENT IN THE MATTER OF THE RESET OF THE ELECTRICITY TARIFF etc

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2014

INTRODUCTION

The **Electricity Commission** (hereinafter referred to as "the Regulator") was established in July 2008 by Act of Parliament[1] and their principal functions are[2] to : -

(a) Develop and recommend regulations establishing standards for **Electrical Safety**;

(b) License **Electricians**;

(c) Develop and recommend regulations establishing requirements for major **Electrical Works**, including maintenance or protection of submarine cables;

(d) Carry out all activities required under any **Concession Contract**;

(e) Take any **Enforcement Action** required;

(f) Develop and recommend any additional powers required by a **Concessionaire**[3] to enably them to perform their concession contract obligations;

Functions (a) – (c) comprise the **Public Safety** role of the Regulator and (d) – (f) are the pure **Economic Regulation** oversight functions of the Regulator.

This Statement is concerned with the Regulator's oversight functions under the Act and the **Electricity Concession Contract** of July 2008 (hereinafter referred to as "the Contract").

That Contract was not drafted by the Regulator: indeed they had no input whatsoever into its content. On 29th July 2008 when first that document was made available to the Regulator the Commissioners recorded in their Minutes their "considerable displeasure at not having been afforded the opportunity to comment on a draft "of the Contract" as there were aspects (of the Contract) which caused them considerable disquiet."

Notwithstanding, every effort was made thereafter by the Regulator and TPL to apply that contract in their dealings with each other. One of the desirable results of the present Reset process would be the emergence of a more perfect Regulatory Instrument best suited for an appropriate and effective regulation of the electricity sector during the Second Reset Period which for present purposes is assumed will run from 1st July 2015 to 30th June 2020.

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[1] Electricity Act 2007
[2] Section 4 of the 2007 Act
[3] Tonga Power Limited (referred to herein as "TPL")

The Regulator cannot make a Reset determination until they have considered all the evidence which will be forthcoming during the Reset process. However at this preliminary stage in the proceedings it was thought that a broadly based Statement of Regulatory Intent might not be unhelpful.

RESET

Apart altogether from the mandatory (statutory and contractual) requirements of the Reset process, which will be referred to later on, there are some OBVIOUS and COMMON-SENSE questions which the Regulator should be – and will be – asking itself between now and 30th June 2015 by when the Reset process must have been completed.

Simply put there are FOUR questions for consideration : -

a	What must be done to ensure that Tongan Electricity Consumers receive a **continuous, safe and reliable supply of electricity?**
b	Are TPL's expenditure proposals, both CAPEX and OPEX, the most **efficient and effective** way of achieving such a continuous, safe and reliable supply of electricity?
c	Are cost-effective **Innovative Technologies** with a proven track-record being utilised?
d	PARAMOUNT QUESTION – How can the **Electricity Tariff** be kept as low as possible?

The Electricity Act 2007[4] provides the framework for electricity regulation and the Electricity Concession Contract of 2008[5] provide the detail for the review and reset of the terms of the 2008 Contract. What the Act and the Contract mandate best can be summarised thus : -

- The Reset must be completed before 30th June 2015.
- The Conduct of that Review shall be as detailed in Schedule 10 of the Contract.
- The matters to be reviewed are described in Paragraph 1 of Schedule 10.
- The rules to be followed in resetting the matters described in Paragraph 1 of Schedule 10 are detailed in Schedule 11 of the Contract.

[4] Section 20 and Schedule 1
[5] Principally Clause 9 and Schedules 10 and 11

Paragraph 1 of Schedule 10 describes the matters to be reviewed during the Reset process.

They include : -

- The Fuel and Non-Fuel components of the Electricity Tariff.
- The Adjustment Formula and indexation factors for periodic review of the Non-Fuel Tariff – presently conducted on an annual basis.
- The Adjustment Formula for the Fuel Tariff – presently conducted on a quarterly basis. This will require inter alia a review of Fuel Type, Generation Mix, and Fuel Efficiency Targets.
- Efficiency Standards generally.
- Bad Debt allowances.
- Service Standards.
- Metering and other reporting standards.
- Penalties.
- Capital Expenditure for the Second Reset period.
- Duration of the Second Reset period and whether this should be co-terminus with the Period for which the Reset Tariff applies.

The Regulator is required by law[6] to procure **expert advice** on the matters to be reviewed, which will provide an independent, external and neutral commentary thereon.

Also, and very properly, the law[7] requires the Regulator to **undertake public consultations** on the matters to be reviewed during the Reset.

[6] Paragraph 3(2) (a) of Schedule 1 of the Act
[7] Paragraph 3(2)(b) of Schedule 1 of the Act

The Provisional **Reset Timetable** will be as follows : -

31 December 2014 :	Tonga Power Limited must produce to the Electricity Commission by this date their detailed Reset proposals.
January 2015 :	The Regulator instructs an external Expert to produce the Advice required by Para. 3(2)(a) of the Contract.
January + February 2015 :	Consultations and Discussions between TPL, Regulator and the Expert.
15 March 2015 :	Expert's Report to be produced by this date.
Second Half of March 2015 :	TPL Proposals and Expert's Report published and written submissions requested from the public at large.
30 April 2015 :	Closing date for (a) public submissions and (b) comments by TPL on Expert's Report.
May 2015 :	Public Hearings.
June 2015 :	Regulator prepares and publishes its Reset Decision.

GENERATION

As at March 2014 TPL had an installed generation capacity of about 15,392 kW produced by 16 diesel-powered gensets and 1 solar array (Maama Mai). Since then there has come on line a 500 kW solar array in Vava'u (La'a Lahi). A further 1 MW of Solar is presently being constructed at Vaini and should be fully operational by about Easter 2015. Accordingly as at 1st July 2015 when the Reset outcome becomes effective the picture is as set forth in the following **Table-1.**

TABLE - 1

LOCATION	CAPACITY (MW)	UNITS
Tongatapu		
Diesel (82.6%)	11,400	7
Solar **(17.4%)**	2,400	2
TOTAL (100%)	13,800	9
'Eua		
Diesel (100%)	360	2
Ha'apai		
Diesel (100%)	360	2
Vava'u		
Diesel (79%)	1,872	5
Solar **(21%)**	500	1
TOTAL (100%)	2,372	6

TPL has some 20,516 customers as shown in Table – 2 below : -

TABLE – 2

LOCATION	RESIDENTIAL CUSTOMERS	NON-RESIDENTIAL* CUSTOMERS	TOTAL
Tongatapu	12,277	3,037	15,314
Vava'u	2,344	863	3,207
Ha'apai	757	211	968
'Eua	937	90	1,027
	16,315 (79.5%)	4,201 (20.5%)	20,516 (100%)

*Non-Residential Customers include Industry, Schools, Churches, Government, Offices, Tourist Facilities.

Gross Generation of electricity in 2008 amounted to 56.7 million kWh but as a result of the Global Financial Crisis fell to around 52.6 million kWh in 2009, 2010 and 2011. In 2013 there was a substantial uplift to around 54.3 million kWh. It is anticipated that by 1st July 2015 (Reset Date) production will have returned to 2008 levels. A question for consideration during the Reset therefor will be agreement on a realistic forecast for economic growth in the Kingdom during the period 2015-2020. From that can be extrapolated the likely growth in electricity demand , although against that figure an allowance (perhaps not insignificant) must be made for economic bypass, or loss of income to TPL due to customers' adoption of RE self-generation and Energy Efficiency Initiatives.

Thus it can be seen that since 2008 there has been a substantial degree of Renewable Energy (RE) penetration of the generation market. This is merely the beginning. In Mid-September 2014 the Tongan Cabinet set a Target of 100% RE generation capacity to be installed by 2020. In formulating their Reset generation proposals to the Regulator TPL will have to give proper regard to that Target.

Other relevant generation issues for Reset consideration will include : -

(a) Agreement on Efficiency Standards for Solar Generation :

(b) Reset of the Heat Rate efficiency standards for diesel generation :

(c) Reset of the Parasitic Load[8] element of overall System Losses :

(d) Achieving n-1 security of supply standards on each of the Kingdom's four island grids :

(e) Setting Realistic and Achievable Performance Standards for Generation Outages :

(f) Ensuring Grid Stability with the progressive introduction of substantial quantities of RE generation:

(g) Demand forecasts : and

(h) Securing a cheaper Supply Chain for Diesel to be used for electricity generation.

When reviewing TPL's generation proposals for the future the Regulator will require to consider the impact of RE generation technologies (such as Solar PV) not only for their impact on investment and the tariff, but also upon the security of electricity supply to Tongan consumers over the medium to long term. The greater the degree of RE penetration, the greater the impact of such technologies on the Grid: this is a rather complicated technical issue with significant cost implications to which careful attention must be given during the Reset.

[8] Parasitic = % of electricity generation used onsite and therefore not available for sale to consumers.

RENEWABLE ENRGY

There are many good reasons for an increased focus on renewable, rather than diesel, electricity generation. Principal among those reasons would be : -

- RE permits use of a **resource locally available,** namely the Sun.
- The greater the degree of RE penetration, the higher the degree of **energy security.** Historically Tonga has been almost fully dependent upon imported fossil fuels which, in terms of price, were subject to the extreme volatility of global markets.
- Fuels Costs for electricity generation in Tonga, due to **World Prices,** increased from some 13 million Pa'anga in 2005 to around 21 million Pa'anga at present, an increase of over 61%.
- **OPEX costs** for RE generation are a fraction of that for grid-connected diesel generation and, mainly, are not subject to market volatility.
- The avoided cost of imported fuel would significantly benefit the Kingdom's **balance of payments.**
- **Collateral Benefits** include a Reduction in Noise Pollution (from Diesel gensets); a Reduction in Air Pollution (reduction in $C.O_2$ and $N.O_x$ emissions[9]).
- **CAPEX costs** of RE Solar P.V. units have decreased substantially over the last 30 years or so. Thus 1 silicon PV cell cost some 79.67 USD per Watt in 1977 but now costs only 0.36 USD/watt[10]. In life-cycle terms solar PV generation is now a cheaper option than diesel generation.

A key issue for consideration during the Reset will be the benefit to be attributed to Tongan electricity consumers from the Avoided Costs TPL achieve from RE generation, and how this is to be factored into the Regulated Electricity Tariff. To date the avoided costs passed on to consumers by a tariff adjustment EXCEED the avoided cost of diesel purchases. For the future it is highly desirable that the mechanism for determining the totality of avoided costs from RE generation, and the impact thereof on the Regulated Electricity Tariff, be set forth in the Reset revisions to the Contract. That will provide absolute Transparency which the Regulator considers necessary to counter erroneous and simplistic expectations which have gained considerable traction in recent times in certain parts of Tongan society.

[9] Carbon Dioxide and Nitrous Oxide
[10] Bloomberg, New Energy Finance

DISTRIBUTION

The activity of bringing electricity to consumers over what is often called the National Grid comprises TPL's transmission and distribution business, in Tonga conveniently just referred to as Distribution. There is no one Grid in Tonga, but four separate Grids, one for each of the Kingdom's grid-connected island groups, Tongatapu, 'Eua, Ha'apai and Vava'u. TPL's concession does not include the Niuas, at least for the present.

The distribution system comprises High Voltage, Low Voltage and Service Lines extending in length to around 1,000 kilometers.

At the time of the 1st Setting of the Electricity Tariff by the Regulator in January 2009 it was recognized that there had been a systemic failure over many years past to upgrade and maintain the distribution system, as a result of which System Losses at the dawn of the Twenty-First Century exceeded 22% and Outages were a frequent and annoying occurrence.

With the assistance and generosity of aid donors TPL has been able to undertake substantial renewals and improvements to the Grid in recent years. Thus 17 villages on Tongatapu have benefitted from the New Zealand funded Village Network Programme, reducing line losses there in some cases to less than 5%, enhancing safety, reducing faults and improving reliability of supply. This Programme will continue over the next few years with a further 33 villages on Tongatapu targeted for upgrading.

But much still requires to be done to provide the Kingdom with a modern, safe and reliable Grid which meets International "best practice" standards. One matter of particular concern is the state of the Greater Nuku'alofa Network. This must be addressed. However to avoid imposing an intolerable financial burden on today's electricity consumers there has to be a prioritisation of all necessary Distribution upgrades spread over the 2015-2020 Reset period, and beyond. This will be a significant feature of the Reset dialogue. The Regulator will also need to know which of the proposed capital works will be (or are likely to be) donor funded, and which TPL will require to source by commercial borrowing. That in itself will open up the question of what is an appropriate level of gearing for TPL. The effect of these capital works on the Tariff will form a crucial part of the Reset dialogue.

As in 2009 the Regulator encourages TPL and Tonga Government to maximize the aid content for the 2015-2020 round of distribution upgrades as this will directly benefit consumers, not only in terms of safety and reliability, but also in moderating funding which TPL otherwise would require to recover through the electricity tariff.