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**DETERMINATION OF FIJI ELECTRICITY AUTHORITY TARIFF RATES**

***Tariff Alignment Phase II***

By

Fiji Commerce Commission

21<sup>st</sup> October, 2010

## DETERMINATION OF FIJI ELECTRICITY AUTHORITY TARIFF RATES

21<sup>st</sup> October, 2010

### 1.0 Introduction

Energy is the vital basis of the development of human society, which is associated with several aspects of the social production and daily life. It is the basic building block of economic development. With increasing world population and the rising living standards, the demand for energy in the world is steadily increasing. As energy is the important resource and motive power, its cheap and stable supply is the safeguard of the economy and social development. Developing countries are facing the double pressures of economic growth and environmental protection as they have entered the 21<sup>st</sup> century.

Among energy products, electricity is the high-quality secondary energy and the important material base of industrial production and people's life. Electricity is the most flexible form of energy that constitutes one of the vital infra-structural inputs in socio-economic development. Electricity is demanded for household, education, entertainment and commercial and industrial activity.

Over the past few decades' significant changes have taken place in the energy sector in Fiji. Total electricity consumption in Fiji grew from 202.8m KWh in 1980 to 715.3m kWh in 2009, an increase of 252.9%. With respect to oil consumption, it also grew, but with a much lower growth rate. In 1980, the crude oil energy consumed was 85.3 million litres which grew to 91.4 million litres in 2009, an increase of 7% with an annual growth rate of 0.23%.

### 2.0 Fiji Electricity's Application for Tariff Raise

On 24<sup>th</sup> of May, 2010, the Commission formally received an application [submission] from the Fiji Electricity Authority (hereinafter referred to as "FEA", to implement an average 8.82 cents per unit tariff increase for electricity use. At that time, FEA's weighted average tariff rate was 25 cents. Following a thorough examination, Commerce Commission decided to undertake a review of the tariff rates in two phases. In the first phase, anomalies in tariff rates were to be removed. In the second phase, a much more realistic tariff rates to be established taking into account costs of FEA, its efficiency and its ability to fund renewable energy projects as well as its ability to meet debt covenants. In the first phase, the tariff alignment resulted in an increase in the weighted average tariff rate to 33 cents. On 25<sup>th</sup> of August, 2010, FEA made a more comprehensive submission requesting for an increase in tariff rate to 39.2 cents. FEA's request for an increase was based on the following factors:

- That IPP entry into renewable energy generation will be enhanced via a higher tariff rates to them. With the entry of increased number of IPP's, FEA's target of producing 90% of its total energy requirement from renewable sources could be achieved at least by 2015;
- That it will enable FEA to earn a commercial return on the equity invested by its shareholder, the Fiji Government;
- That FEA will be able to maintain it's gearing ratio (debt/debt+equity) below the maximum target level of 50% and enable it to meet the debt covenants imposed by China Development Bank and ANZ Bank when FEA obtained the foreign currency loans of US\$100 million to construct Nadarivatu renewable hydro power project;
- That FEA is able to deliver on to government macro-economic targets, in particular to reduce Fiji's fuel import costs and save foreign exchange which could be around F\$75 million per year;
- That correct prices in the market will push users to undertake efficient consumption behavior;
- That removal of subsidies will eliminate the Dead Weight Loss in the energy market during the subsidy era; and,
- That FEA, with a commercial tariff structure will make listing and sale of shares via the stock market more plausible.

Against the above case put forward by FEA, the commission began its process to examine FEA's request.

### 3.0 Commission's Approach

The Commission proceeded to examine the submission on its own merit. In the process, the Commission resorted to data provided by FEA, FEA's Annual Report and its own primary and secondary research including a visit to FEA's Monasavu Dam and Wailoa Power Station.

In the process of analysis, the Commission was mindful of the fact that the price sought and approved should reflect a competitive market price. Furthermore, in the process of analysis, the Commission also noted the concerns of the stakeholders. The stakeholders include the consumers as well as the high end users such as the industrial sector. This consultation process included commission receiving oral submission from public at different parts of Fiji as well as calling for written submissions.

### 4.0 Commissions Analysis

Based on the Commission's analysis, the issues highlighted below are quite revealing.

4.1 Benchmarking: An examination of Tariff Rates from comparable economies, in particular the Pacific Island Economies reveal that Fiji's Tariff rates, is much lower than all the other Pacific Island Countries. For example, Samoa has an average tariff rate of F\$0.59 relative to Fiji's rate of F\$0.33 per unit. Solomons has a tariff rate of \$1.47 per unit. The country closest to Fiji is Australia with a Tariff rate of F\$0.42 (see Table 1).

Table 1: Benchmarking Electricity Tariff Data.

Average Electricity Prices	Fiji cents / kWh
<b>Fiji - current</b>	33.00
<b>Fiji - proposed</b>	39.40
<b>Australia</b>	42.36
<b>Palau</b>	43.09
<b>New Zealand</b>	47.48
<b>Samoa</b>	58.75
<b>PNG</b>	60.12
<b>New Caledonia</b>	60.71
<b>Kiribati</b>	61.81
<b>American Samoa</b>	67.23
<b>Tuvalu</b>	69.08
<b>Niue</b>	83.79
<b>Tonga</b>	89.38
<b>Vanuatu</b>	93.30
<b>Cook Islands</b>	93.56
<b>Solomon Islands</b>	147.83

Source: Respective Country's Utility Regulator or Utility Institution, August, 2010.

**4.2 Cost Modelling:** Based on computations of the primary data, the unit cost of generating electricity from diesel fuel could stand at 48 cents. Taking a transmission, distribution and retail (TDR) unit costs of 13 cents, the final unit costs stands at 61 cents. With regard to hydro electricity, the unit generation cost stands at 11.5 cents. With TDR unit cost of 13 cents, the final unit cost for hydro electricity could approximate to 24.5 cents. With different ratios of hydro and diesel power, the unit electricity costs would vary. At a 60/40 hydro/diesel ratio, the electricity costs could approximate to 39.1 cents. At a 40/60 hydro/diesel ratio, the unit electricity costs could approximate to 46.4 cents. FEA in their submission computes unit cost of 40.78 cents for hydro and 59.91 cents for diesel based on a **25% return on equity**.

**4.3 Renewable Energy Generation and Independent Power Producers:** The Commission notes that while FEA is actively pursuing strategies to raise electricity generated from renewable sources, it must also provide incentive to Independent Power Producers (IPP's) to sell electricity to FEA's grid. The commission in its last determination had raised the IPP tariff rate to 23 cents. This has indeed generated lot of interest from potential investors to supply electricity to the grid. FEA in its submission to the Commission lists the following plans to increase renewable energy production in Fiji:

- (a) Wailoa (FEA) – The existing 80MW (gross) hydro power station of FEA generating about 400 GWh per year long-term average;
- (b) Nagado (FEA) – The existing 2.8 MW hydro power station, which is operationally constrained to about 1.8 MW, 18 GWh per year due to hydraulic vibration problems of its pipeline;
- (c) Wainikasou (FEA) – The existing 6 MW hydro power station, with only one unit on firm capacity and generates about 18 GWh annually;
- (d) FSC Lautoka (IPP) – The existing co-generation power station at FSC's Lautoka sugar mill, which is available for generation only during the sugar crushing season. This plan assumes that the generation output will be made available by FSC through full year by 2012 at an increased price for electricity;
- (e) Tropik Drasa (IPP) – The 9.3 MW co-generation power station which was commissioned in 2008 at Tropik Wood's Drasa timber mills;
- (f) Nadarivatu (FEA) – The 40 MW hydro power station under construction by FEA, assumed to be commissioned on 1<sup>st</sup> January 2012 for this plan, with an expected output of 101 GWh per year;
- (g) Vuda Biomass (IPP) – The 18 MW dedicated wood-fired biomass power station planned to be constructed by Pacific Renewable Energy Limited for commissioning by 1<sup>st</sup> July 2012;
- (h) Wainisavulevu (FEA) – The planned project by FEA to raise the weir structure at Wainisavulevu by 2012 to enable increased generation from the existing Wainikasou and Wailoa hydro power stations, with increased energy of 7 GWh per year but no increase in firm capacity;
- (i) Wailoa Downstream (FEA) – The planned project to build a hydro power station downstream of Wailoa, with 7 MW capacity and 35 GWh of generation per year and commissioning in 2014. Feasibility studies have been completed by JBIC and funding is being sought for its construction;
- (j) Qaliwana (FEA) – The planned project to build a hydro power station at Qaliwana in the Nadarivatu hydro power scheme, with 10 MW capacity and 43 GWh of generation per year and commissioning in 2014. Pre-feasibility studies have been completed and Expressions of Interest have been called for its preliminary design;
- (k) FSC Rarawai (IPP) – This is a new power station at FSC's Rarawai sugar mill operating on sugar bagasse during the crushing season and hog fuel during other months. Feasibility studies have been completed for a 20-25 MW power station but FSC is yet to make a decision whether to proceed with its construction. The increased tariff rate is expected to assist in a favourable decision; and,
- (l) VLIS Biomass (IPP) – This is a dedicated 10 MW wood-fired biomass power station, yet to be identified, with 5 MW in 2017 and a further 5 MW in 2018. A number of IPPs have shown interest in recent past to construct biomass and waste-to-energy power stations, provided they are paid an appropriate price for their electricity. If no IPP builds this plant, then FEA or the Fiji Government will be required to build a similar power station using either wood or some other form of energy, including imported coal.

**4.4 Electricity Generation and Demand:** With a growing Fiji economy, the total electricity demanded is also increasing. In 2008, the total demand was 774.6 GWh. In 2009, it increased to 785.6 GWh and it is expected that this demand will increase to 1150.5 GWh in 2015. However, Fiji has a capacity of only generating 54% of the total required from renewable energy source (see Table 2 below).

Table 2: Electricity Generation and Demand (GWh), 2008-2015.

Year	2008	2009	2010	2011	2012	2013	2014	2015
<b>Total generation required made up of:</b>	774.6	785.6	820.4	898.9	968.7	1035.1	1096.8	1150.5
<b>Wailoa (FEA)</b>	400.0	400.0	360.0	400.0	400.0	400.0	400.0	400.0
<b>Nagado (FEA)</b>	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
<b>Wainikasou (FEA)</b>	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
<b>Waniquu (FEA)</b>	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
<b>FSC Lautoka (IPP)</b>	15	15	15	15	15	40	40	40
<b>FSC Labasa (IPP)</b>	7.0	7.0	7.0	7.0	15.8	15.8	15.8	15.8
<b>Tropik Drasa (IPP)</b>	0.0	0.0	24.0	72.0	72.0	72.0	72.0	72.0
<b>Nadarivatu (FEA)</b>	0.0	0.0	0.0	0.0	101.0	101.0	101.0	101.0
<b>Vuda Biomass (IPP)</b>	0.0	0.0	0.0	0.0	71.0	141.9	141.9	141.9
<b>Wainisavulevu (FEA)</b>	0.0	0.0	0.0	0.0	7.0	7.0	7.0	7.0
<b>Labasa Biomass (IPP)</b>	0.0	0.0	0.0	0.0	15.8	15.8	31.5	31.5
<b>Savusavu geotherm (IPP)</b>	0.0	0.0	0.0	0.0	0.0	15.8	31.5	31.5
<b>Wailoa Downstream (FEA)</b>	0.0	0.0	0.0	0.0	0.0	0.0	35.6	35.6
<b>Qaliwana (FEA)</b>	0.0	0.0	0.0	0.0	0.0	0.0	43.8	43.8
<b>FSC Rarawai (IPP)</b>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	87.6
<b>VLIS Biomass (IPP)</b>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>Diesel &amp; HFO (FEA)</b>	314.4	325.4	376.2	366.7	233.1	187.7	138.4	104.6
<b>Renewable energy</b>			444.2	532.2	735.7	847.4	958.3	1045.9
<b>Non Renewable Energy</b>			376.2	366.7	233.1	187.7	138.4	104.6
<b>Proportion of non renewable energy</b>	37.0%	43.0%	45.9%	40.8%	24.1%	18.1%	12.6%	9.1%
<b>Proportion of renewable energy</b>	63.0%	57.0%	54.1%	59.2%	75.9%	81.9%	87.4%	90.9%

Source: Raw data obtained from FEA, September, 2010.

## 5.0 Determination

### 5.1 The Commission notes:

- a) FEA and Fiji is solely relying on Wailoa Power station and Monasavu Dam for almost all of its renewable energy that is currently being supplied;
- b) That the current renewable energy sources are grossly inadequate to supply Fiji's electricity demand;
- c) That current tariff levels is not only a inhibiting factor to attract IPP's, but also inhibits FEA from making any capital investment for more renewable energy production;
- d) That the rising level of fuel prices is having a major impact on Fiji's foreign reserve position;
- e) That relying on fossil fuels to power Fiji's growth plan is not only economically and financially risky, but also a security issue for the nation;
- f) That it cannot approve a rate which is higher than a competitive market rate as it would affect businesses by raising their unit cost. The Commission also notes that it cannot approve a rate lower than a competitive market rate or a rate which subsidises the end users power bill as it will lead to misuse and wastage of resources. The Commissions determination cannot promote inefficiency in the energy sector in Fiji;
- g) That the Department of Energy should make submission to government to ban importation of energy inefficient appliances and equipment to manage the demand side; and,
- h) That FEA must engage in a serious exercise to reduce its overheads. A separate report based on an inquiry into the financials and operations will highlight some of the areas in which FEA can achieve significant reductions.
- i) This determination is to deliver on to the objectices outlined in 6.0 below. It must not be used maintain status quo. It must not be used to relax on stringent efficiency measures already in place. Instead, it must be used as a window of oppportunity to improve efficiency in FEA operations, reduce unit costs and contribute to wards fostering growth and development of the country.

### 5.2 In arriving at this determination, the Commission carefully considered:

- a) The impact it will have on Fiji's economy, in particular its reserves;
- b) The impact on the commercial sector and its competitive edge in the product market;
- c) The impact on FEA's financials and its plans to produce and supply most of its electricity requirement from renewable energy source;
- d) The impact subsidies have on resource consumption via sub-optimal resource pricing; and,
- e) The ability of Fiji to deliver on to its objective of achieving energy security and stability.

### 5.3 In light of the above issues, the Commission has approved a forward looking tariff plan as presented in Table 3 below.

**Table 3: Electricity Tariff Rates Schedule.**

Tariff Categories	Existing tariff rates	1-November-2010	1-April-2011	Final Tariff rate	Increase / (Decrease)
<b>Domestic Category</b>					
Domestic Life-line Tariff (<=130 kWh per month) c/kWh	17.2	34.84		34.84	17.64
Domestic Other Tariff (>130 kWh per month) c/kWh	34.84	34.84		34.84	0
<b>Commercial &amp; Industrial Category</b>					
Commercial & Industrial Tariff –upto 14,999 kWh per month, c/kWh	37.47	39.34	42.00	42.00	4.53
Commercial & Industrial Tariff - in excess of 14,999 kWh per month, c/kWh	39.47	41.44	44.00	44.00	4.53
<b>Maximum Demand Tariff</b>					
<b>(1) Demand &gt; 1000kW</b>					
Demand charge \$ per kW per month	27.59	33.11	40.20	40.20	12.61
Energy charge c/kWh	18.81	24.92	33.50	33.50	14.69
<b>(2) Demand 500 - 1000kW</b>					
Demand charge \$ per kW per month	27.59	31.73	38.50	38.50	10.91
Energy charge c/kWh	20.88	25.06	31.00	31.00	10.12
<b>(3) Demand 75 - 500kW</b>					
Demand charge \$ per kW per month	27.59	31.73	36.20	36.20	8.61
Energy charge c/kWh	21.58	24.82	28.50	28.50	6.92
For Maximum Demand and Commercial & industrial consumers who elect to take a power supply directly at the high voltage, a discount of 4% is allowed.					
Excess Reactive Energy penalty fee c/kWh	19.64	44.00		44.00	24.36
<b>Institution Tariff c/kWh</b>	<b>20.59</b>	<b>34.84</b>		<b>34.84</b>	<b>14.25</b>
<b>Street Light Tariff c/kWh</b>	<b>34.84</b>	<b>34.84</b>		<b>34.84</b>	<b>0</b>

Note: Subsidies provided by FEA are now removed and government will announce its plans to deal with those in this category

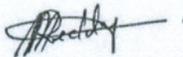
5.4 The subsidies provided to low income domestic household sector as well as to those in the institutions category by FEA is now dropped and government will now announce its plans to subsidise low income households.

5.5 The maximum demand tariff had to be adjusted to fix a anomaly in the current tariff rates. In the current rates, the average Maximum Demand tariff rate gets lower than the Commercial and Industrial tariff for customer load factors as low as 20%-25%. Low load factors indicate inefficient utilization of the installed power capacity. The difference is very substantial for load factors above 40%. This will incentivise the high-priced Commercial and Industrial customers to switch to the low-priced Maximum Demand tariff. Furthermore, high demand Maximum Demand customers (such as >1000kW MD) pay lower rates than the low demand MD customers. In the new determination, this anomaly have been rectified by reducing the price difference between the two tariffs.

- 5.6 That the new tariff rates are effective from dates stated in the schedule. For the Commercial category, the increase is awarded in two steps. The first increase is effected on the 1<sup>st</sup> November 2010 while the second increase is effective from 1<sup>st</sup> April, 2011.
- 5.7 With the new tariff rates coming in to effect from 1<sup>st</sup> November, with weighted average tariff rate moving to 36 cents and then to 39 cents, the FEA is now in a better position to offer higher tariff rates to investors to enter into the generation of renewable energy. Given that costs structures of IPPs will be different in different parts of Fiji, there is a strong case for differential IPP tariff rates. In this regard, the IPP tariff rates approved by Commission is a minimum rate of 27 cents per unit. The FEA could consider a higher tariff rate to attract investors in high cost regions such as Vanua Levu or outer islands.

## 6.0 Future

The Commission looks forward to Fiji generating and supplying most of its electricity requirements from renewable energy sources in the near future. In such a scenario, the owners of the capital will benefit via higher returns, the country will benefit by making saving on its import expenditure, local economy will benefit by increased economic activity via IPP's, the environment will benefit via less pollution and the end users will also benefit by having significantly lower tariff rates. This determination's expectation is nothing less. The Commission will continuously monitor FEA's progress towards this vision.



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