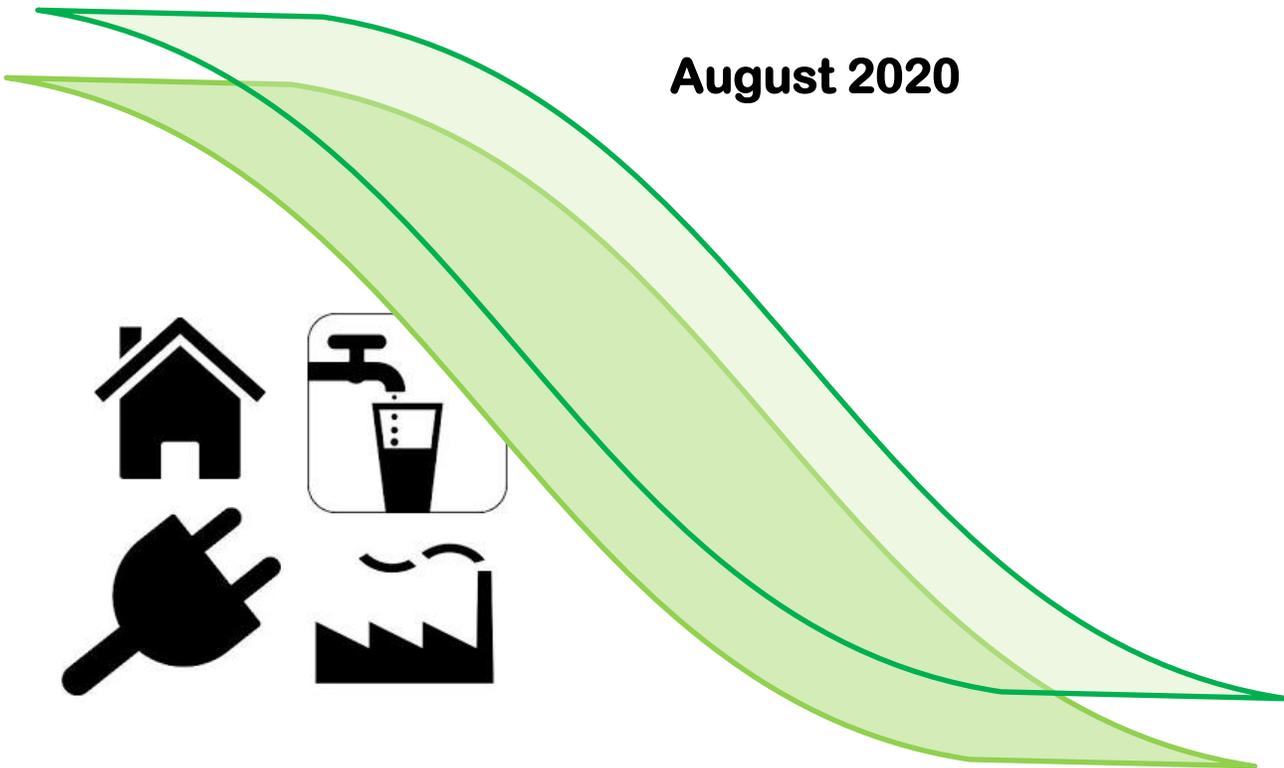


**Utilities  
Regulatory  
Authority**

# Comparative Report

## Pacific Region Electricity Bills

**August 2020**



## Letter from the CEO

This is the seventh Electricity Price Comparison report of the Utilities Regulatory Authority (the 'Authority') for the small pacific island countries and territories based on January 2019 data.

It has been our aim to continue in conducting this annual exercise to gather, compile and disseminate current electricity pricing in the Pacific region. Information presented in this report can be used to observe trends and some factors influencing electricity prices. This report is designed from a consumer's standpoint, computing the total bill a consumer pays, including the costs related to energy use, fixed charges and all applicable taxes. In contrast, most studies are performed from the utility perspective, capturing generation, distribution and supply related fixed and variable costs, return on investments or profits, but not necessarily reflecting the total retail price paid by the customers.

Section 4 of this report illustrates the movement of tariffs over time. The aim is to capture the impact of regulatory programs including subsidy regimes applicable Government taxes and levies, energy infrastructure investments, and renewable energy contribution and efficiency efforts by the utility across the Pacific region, and measure their combined impact on ultimate consumer bills. As the region is dependent on diesel fuel for at least the base load, we have flagged the component of diesel in the generation mix for each utility, to provide some reference point for their ranking in the price index.

To study comparability in the current bills, we have used the spot currency exchange rates in January 2019 as similarly with previous reports, since the trend in rankings is only meaningful by holding exchange rates constant from the last version of the report.

The bill comparison study is marked by a somewhat steady move in the global oil price throughout 2018 and drop in the final quarter of 2018, and slowly rises again in the first quarter of 2019 as shown in the Dubai Fateh Price<sup>1</sup> and reflected in the January 2019 electricity prices used in making the electricity price comparisons.

Regardless of the fall in price in the second half of 2018, consumer energy prices continue to increase across the Pacific region. This may be due to the time-lag in transportation and logistics of the fuel supply chain from refinery port (Singapore) to the Pacific islands and other factors. The delay in locally realising the changes in international fuel prices differs for each country may be based on the distance from the port of origin, supply route, frequency of supply, the local demand (volumes) and the respective capacity of storage facilities.

Another effect that was measured in Vatu currency and is reflected in this report was the appreciation of US dollar against local currencies for some countries in the region (those using respective local currencies other than USD), thereby further increasing costs of electricity price to electricity consumers as diesel used in electricity production and other derivative products are globally priced in US dollar.

It was observed that USD has depreciated against VUV (local currency) by 5% which has helped absorbed international fuel prices shock for January 2019.

I hope that this report is of some value to those interested in electricity prices in the Pacific island countries, and take this opportunity to thank all the professionals involved, the regulatory agencies and electricity companies who assisted our URA team in providing data.

I welcome any suggestions to improve future analysis and reports.

Sincerely,

John Obed Alilee

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<sup>1</sup> <http://www.indexmundi.com/commodities/?commodity=crude-oil-dubai&months=60>

CEO, Utilities Regulatory Authority of Vanuatu

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# 1. Introduction

## 1.1 Purpose of this paper

The aim of this paper is to provide a comparison of electricity prices paid by customers in Vanuatu with customers in different small Pacific island countries across the region. It does not however, constitute a comparison of the utility's performance in terms of its quality, availability, and reliability of service that may also have varied widely between electricity suppliers across the Pacific which affects electricity pricing; but is simply a comparison of the customer electricity prices based on different customer categories (assumed for this purpose) in the different Pacific island nations. The availability of natural resources, the generation-mix, the nature of the terrain, and the level of subsidies, utility efficiencies, government taxes and tariff policies all contributed to the structural price differences between the Pacific island nations. Data used is based on information sourced directly from utilities, regulatory agencies and/or publicly available information on electricity rates for different utilities on respective websites and includes all applicable taxes and fees.

The methodology used in this report is the same as used in earlier reports. That is comparison of the total cost of electricity for certain given levels of consumption and by major customer categories. This avoids differences in country-specific average or typical levels of consumption and customer mix when comparing average prices across countries.

## 1.2 Structure of this paper

This paper is structured into the following sections:

- Chapter 2, **'Methodology'**, describes the approach used to compare the cost of electricity services across the Pacific region.
- Chapter 3, **'Electricity price comparison and analysis'**, provides a comparison of electricity bills across the Pacific region and gives summary conclusions.
- Chapter 4, **'Electricity price evolution'**, shows how the tariffs have changed and trends in energy prices across the region since February 2019, time of our last release of this report comparing January 2018 electricity prices.

## 1.3 Useful links

Readers of this report may find it useful to consult the following sources:

- American Samoa Power Authority: <http://www.aspower.com>
- Argus Media Limited: <http://www.argusmedia.com/>
- Cook Islands energy provider: [www.teaponga.com](http://www.teaponga.com)
- EEC New-Caledonia: <http://www.eec.nc/>
- Fiji Electricity Authority: [www.fea.com.fj](http://www.fea.com.fj)
- FSM-Chuuk Public Utilities Corp.: <http://www.cpuc.fm>
- Guam Power Authority: <http://guampowerauthority.com>
- Marshalls Energy Company: <http://mecrmi.net>
- New Zealand Ministry of Foreign Affairs and Trade: <https://www.mfat.govt.nz/>
- Pacific Power Association: <http://www.ppa.org.fj>
- Palau Public Utilities Corporation: <http://www.ppuc.com>

- PNG Power Ltd.: <http://www.pngpower.com.pg>
- Rep – 5 : <http://www.rep5.eu>
- Republic of Kiribati Island report series: [www.climate.gov.ki](http://www.climate.gov.ki)
- Tonga Power Ltd.: <http://www.tongapower.to>
- Tuvalu Electricity Corporation: <http://www.tectuvalu.tv>
- Vanuatu Utilities Regulatory Authority: [www.ura.gov.vu](http://www.ura.gov.vu)
- UNELCO ENGIE: <https://www.unelco.engie.com>

## 2. Methodology

This section describes the method used to compare the Pacific region electricity costs, the analysis and findings presented in this report.

To gather the required data, the staff prepared survey forms that were sent out to all Pacific utilities and regulatory agencies most of whom data were obtained from for preceding versions of the comparative report. For those responses were not received, the staff relied on the latest data available on their website. Each utility included in the survey charges different prices for different categories of customer, and for different levels of consumption. Typical pricing structures include a mixture of monthly fixed charge and per-kWh charge (variable charge) which may vary with consumption within the category, as well as any applicable taxes and other fees. The report is based on comparison of bills, using three typical customer consumption categories as detailed in Sub-section 2.2 below and is applied across the utilities in the Pacific region used in this comparative study.

As previously mentioned, there is no detailed examination of factors such as quality, availability, or reliability of service. These factors may vary widely across the electricity utilities in the Pacific, and should be taken into account when considering the price levels.

Another major factor that influences the cost of electricity is the method of generation. Each utility has a different mix of generation sources, which heavily influences the cost of electricity. Generation methods are not compared in this report. However diesel generation component in total output for a utility is flagged for better understanding and appreciation of the price differences.

### 2.1 Scope

Information from 25 electricity utilities<sup>2</sup> in different islands countries and territories in the Pacific region have been collected and reviewed.

Tariff information's published publicly by regulatory agencies or the utilities were used to calculate customer bills based on typical consumption levels for three different customer categories. All applicable taxes and fees were included, representing the total price of electricity to customers in each country and territories.

### 2.2 “Typical” customer bills

In order to compare electricity suppliers using different customer categories and tariff structures, “typical” bills for three customer categories have been estimated. These represent three main customer categories in Vanuatu within concession areas:

- “Small domestic consumers” are households that only use small amounts of electricity in a given month. There are over 13,556 customers of this type in Vanuatu, with an average consumption of 60kWh per month;
- “Domestic consumers” are domestic customers that have moderate to high electricity consumption. There are approximately 4,888 customers of this type in Vanuatu, with an average consumption of 300 kWh per month;

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<sup>2</sup> All the 25 utility companies are comprised of Private and State-Owned Utility Companies. This report could does not provide the number of different electricity companies operating within a country as there can be more than 1 utility operating in a country. Therefore, the electricity prices depicted in this report does not merely present an average price from the different electricity companies operating within a country, but rather shows the price of a single utility company.

- “Business consumers” are commercial and industrial customers. There are approximately 1,660 customers of this type in Vanuatu. Consumption levels vary widely, so for this analysis we have assumed a “typical” consumption level to be 10MWh (10,000kWh) per month, on a 100kVA connection. As certain countries monitor the actual demand and charge the consumers based on their monthly peak use instead of subscribed capacity, to make comparable analysis, we assumed that the consumer will use a peak load of 100kVA and be charged accordingly. For customers of this size, the connection could be either low voltage (LV) or high voltage (HV). The costs of both options are shown for Vanuatu although customers would be high voltage, but connections in other countries are assumed to be low voltage three-phase connection in a 190v to 415v voltage range depending on the country. High voltage tariffs are excluded from the scope of our study as they are structured in a more complex way, with different rates for day/night consumption, making comparisons more difficult.

The characteristics of each “typical” customer category used in this report are summarized in the table below:

**Table 1: Typical customer bill definitions**

<b>Small domestic customer</b>		
Consumption per month	60	kWh
Subscribed capacity	1.1	kVA
<b>Domestic customer (Other low voltage)</b>		
Consumption per month	300	kWh
Subscribed capacity	3.3	kVA
<b>Business customer</b>		
Consumption per month	10,000	kWh
Subscribed capacity	100	kVA
<b>Power factor conversion</b>		
Cos phi	0.85	

As some energy suppliers use kVA instead of kW to calculate the fixed charge billed for subscribed capacity, we used an average power factor rate of  $|\cos \varphi| = 0.85$  to convert kVA into kW.

Whenever there was an option allowing customers to choose between different offers and rates, we picked the cheapest comparable option according to our selection criteria. These customer categories are assumed not to have access to time of day tariffs, which simplified the comparison by avoiding the need to estimate the spread of consumption across day/night hours.

## 2.3 Foreign currencies exchange rate

Among the electricity suppliers included in this comparison, there are nineteen nations and ten different local currencies apart from countries using USD locally. The fluctuation of currencies impacts the results of the tariff comparison. Since this exercise is about comparing the cost of electricity at a given point in time, and across time, all currencies used in the respective pacific island nations included in this comparison exercise are converted firstly to USD using a single source<sup>3</sup>, and then from USD to VUV using ANZ exchange spot rate (sourced locally); both conversions were picked on a single spot date - 20<sup>th</sup> of January 2019. This avoids

<sup>3</sup> <http://www.oanda.com/currency/converter/20thJan2018>

impact of day-to-day currency fluctuations, and allows for ease of comparison when analyzing previous and current years report. Customer prices computed in the previous release have been adjusted based on current exchange rates used in this report. However, countries' respective rankings in terms of electricity bill comparisons arrived at in the previous report were kept unchanged so assessment of electricity price changes over time is achievable.

**Table 2: Exchange rates as of 20th January 2019**

<b>Country</b>	<b>Exchange rate 1 FX = VUV</b>	<b>Exchange rate 1 Fx = USD</b>
<b>Fiji</b>	52.891	0.478
<b>Palau</b>	110.560	1.000
<b>American Samoa</b>	110.560	1.000
<b>Western Samoa</b>	41.821	0.378
<b>PNG</b>	33.443	0.302
<b>New-Caledonia</b>	1.053	0.010
<b>Kiribati</b>	79.249	0.717
<b>Tuvalu</b>	79.249	0.717
<b>Niue</b>	74.615	0.675
<b>Nauru</b>	79.249	0.717
<b>Marshall Islands</b>	110.560	1.000
<b>Solomon Islands</b>	14.152	0.128
<b>Tonga</b>	48.828	0.442
<b>Cook Islands</b>	74.615	0.675
<b>FSM - Chuck</b>	110.560	1.000
<b>FSM - Kosrae</b>	110.560	1.000
<b>FSM - Pohnpei</b>	110.560	1.000
<b>FSM - Yap Island</b>	110.560	1.000
<b>FSM - Falalop</b>	110.560	1.000
<b>Saipan</b>	110.560	1.000
<b>Guam</b>	110.560	1.000
<b>Tahiti</b>	1.053	0.010
<b>French Polynesia</b>	1.053	0.010
<b>Vanuatu UNELCO</b>	1.000	0.009
<b>Vanuatu VUI</b>	1.000	0.009

*Source: Oanda currency converter*

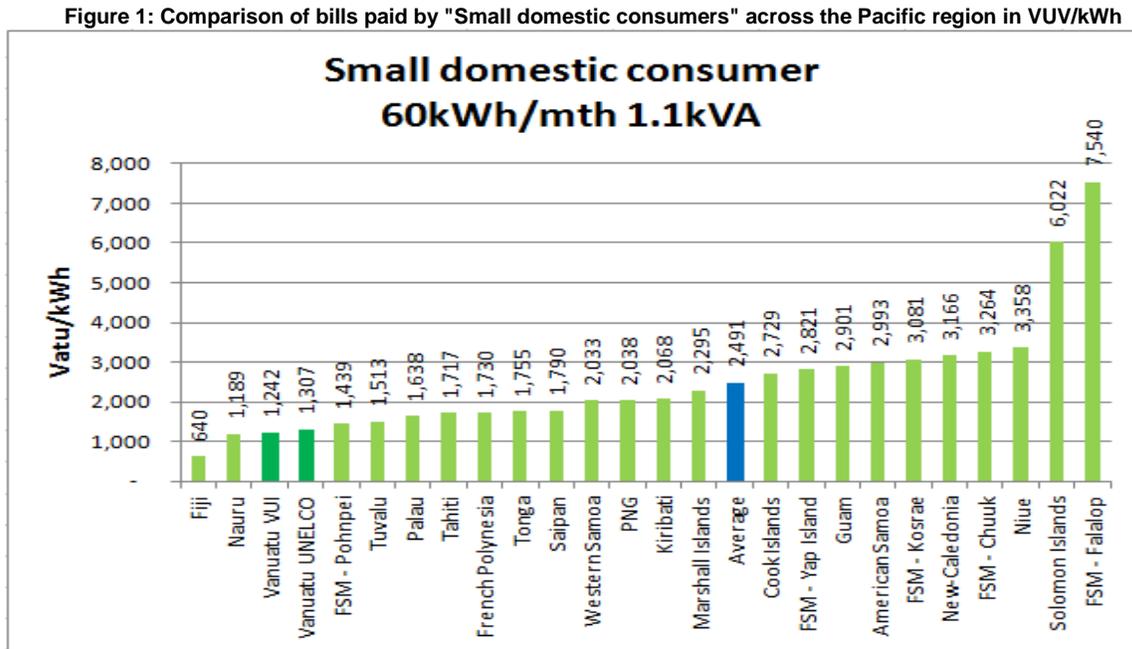
## 2.4 Taxes and government subsidies

Taxes and government subsidies on the price of electricity are factors that electricity suppliers have no control over other than to include them on customer bills. In order to compare electricity costs from a customer standpoint, all applicable taxes, fees and other charges included in an electricity bill are included in our analysis.

## 3. Electricity price comparison and analysis

### 3.1 Small domestic consumers category

The graph in Figure 1 below shows the total bill for monthly consumption of 60kWh on a 5A connection from the 25 electricity utilities across the Pacific region.

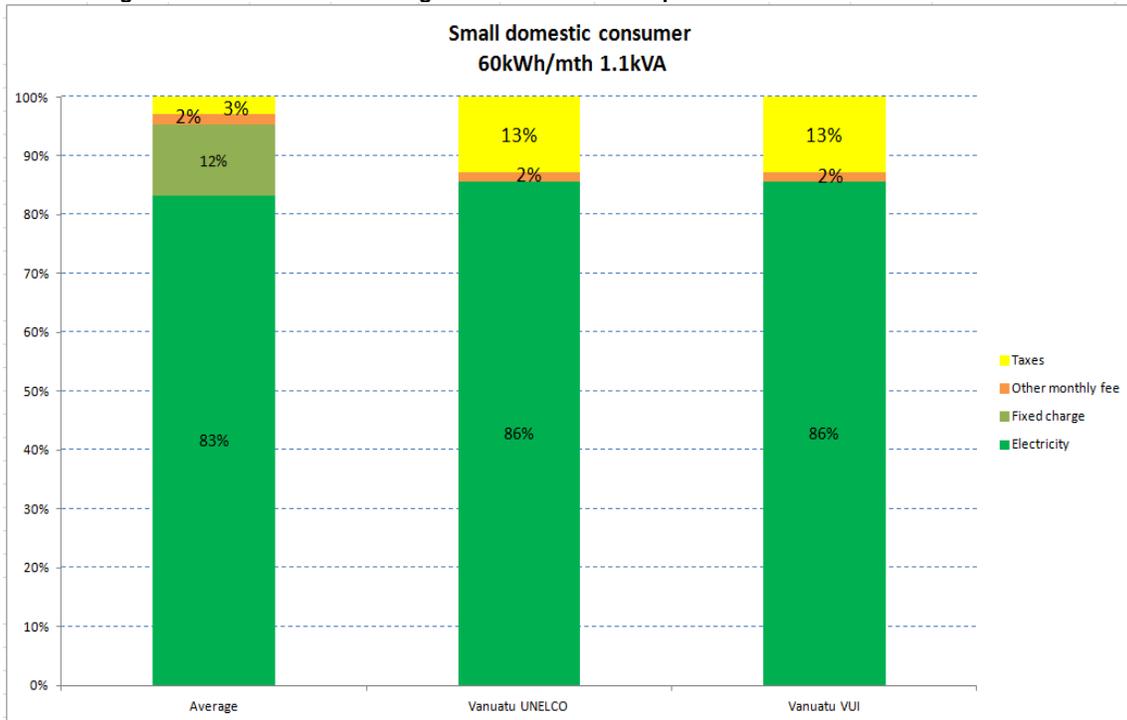


Source: URA

The electricity costs for the “small domestic consumers” category in Vanuatu are among the cheapest in the Pacific region, with VUI and UNELCO ranking 3<sup>rd</sup> and 4<sup>th</sup> respectively out of the 25 utilities. The typical bill paid for these customers in Vanuatu is VUV 1,242 for VUI customers, and VUV 1,307 for UNELCO customers, based on January 2019 prices. This compares to an average bill of VUV 2,491 for the Pacific area. VUI and UNELCO are 50% and 48% respectively below the Pacific average.

In Vanuatu, bills of Small Domestic Customers are cheaper compared to bills of customers in the same category throughout other Pacific island nations. This is because of the ongoing government initiative for small domestic customers in Vanuatu with a level of consumption assumed (0-60 kWh/month) to be heavily subsidized by other customer groups to encourage electricity access and consumption for the low-income earners.

**Figure 2: Vanuatu vs. Pacific avg. – Bill breakdown comparison for “Small domestic consumers”**



Source: URA

The comparison between Vanuatu and the Pacific area average shows that a relatively higher proportion of the electricity bill in Vanuatu is made up of Government taxes which is 13% (VAT portion in total electricity bills) compared to a Pacific average of 3% tax.

In Vanuatu, other monthly fee is comprised of the regulatory fee which recently came into effect. The fee is usually computed based on a specified percentage (%) capped at 2% determined by the URA. It is similarly compared to other monthly fees in the Pacific average.

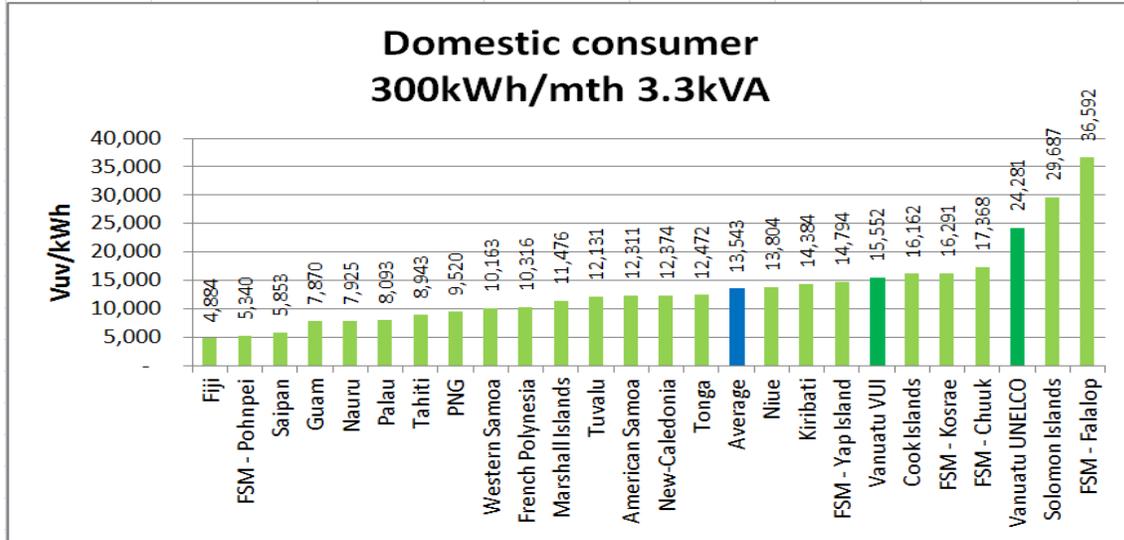
The January 2019 electricity prices in the Vanuatu's bill breakdown continues to highlight the regulatory fee captured under 'Other monthly fee' as observed in VUI and UNELCO. The regulatory fee under the monthly fee further highlighted in previous report was mandated by Act of Parliament of Vanuatu constituting a 2% capped levy on electricity bills which is fairly consistent to the Pacific average of 2%.

There are no fixed charges for this particular consumer category in Vanuatu, compared to 12% fixed charges on average across the Pacific. The significantly lower than average bill of Pacific area in this consumption level in Vanuatu reflects the fact that the tariff for this consumer category is highly cross subsidized.

### 3.2 Domestic consumer category

The following chart shows the total bill for monthly consumption of 300kWh on a 15A connection from the 25 electricity companies across the Pacific region.

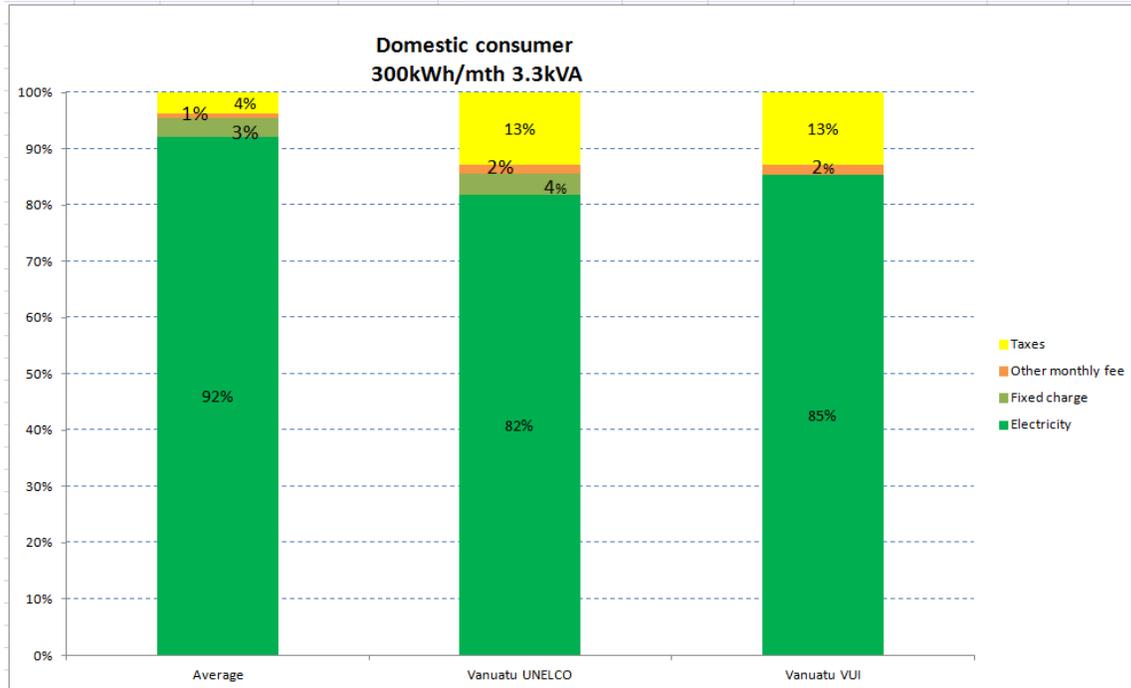
Figure 3: Comparison of bills paid by "Domestic consumer" across the Pacific region in VUV/kWh



Source: URA

The electricity costs for the larger “Domestic consumer” category in Vanuatu are among the most expensive in the Pacific region with UNELCO ranking 23<sup>rd</sup> and VUI - 19<sup>th</sup>, out of the 25 utilities. UNELCO and VUI have maintained respective positions from 2018 to 2019 in the ranking. The typical monthly bill paid for these customers in Vanuatu is VUV 24,281 for UNELCO customers, and VUV 15,552 for VUI customers, based on January 2019 electricity prices. This compares to an average bill of VUV 13,473 for the Pacific area. UNELCO is 79% above the Pacific average, and VUI is 15% above the Pacific average.

Figure 4: Vanuatu vs. Pacific avg. – Bill breakdown comparison for “Domestic consumers”



Source: URA

The comparison between Vanuatu and the Pacific area shows that taxes generally form a higher proportion of Vanuatu’s domestic consumer’s electricity bills. In Vanuatu customers pay 15% VAT on all goods and

services including electricity. This 15% VAT constitutes 13% share on the overall customer total bill which can be compared to the Pacific average of 4% tax as depicted in Figure 4 above.

In Vanuatu, there are fixed charges for UNELCO's 'domestic customers' comprising 4% of the total bill, while there are no fixed charges for VUI customers. This is compared to an average fixed charge of 3% across the Pacific region. Additionally, in Vanuatu, other monthly fees comprised of the Regulatory Levy of 2% compared to a Pacific average of 1%.

### 3.3 Business consumer category

The following chart shows the total bill for a commercial customer with a monthly consumption of 10,000kWh on a 100kVA connection across the 25 electricity companies.

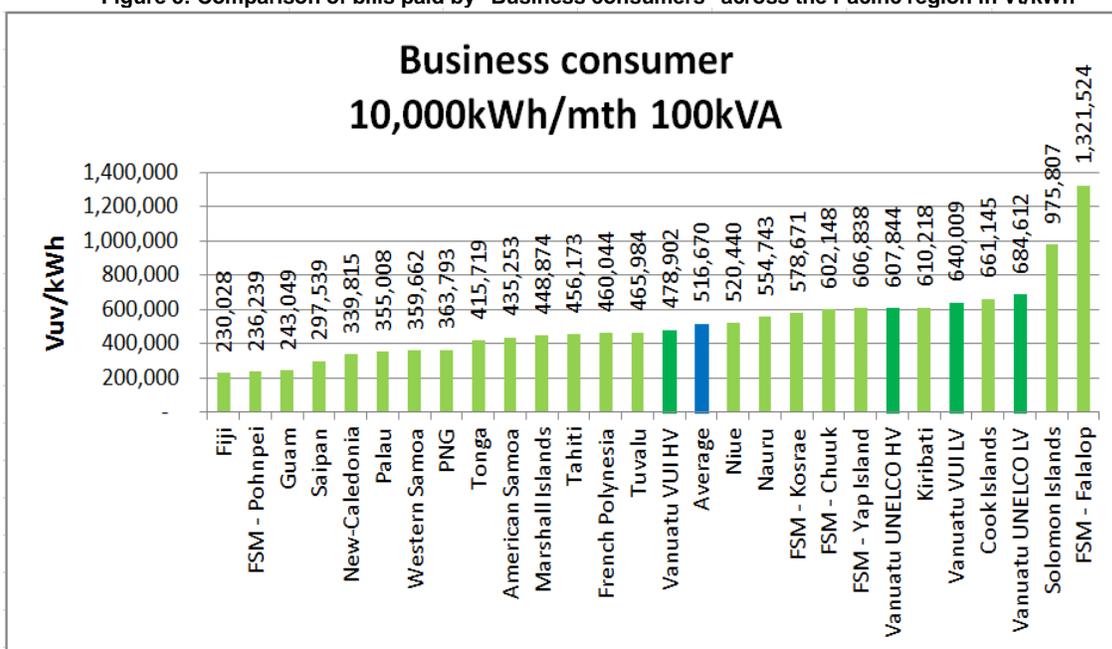
Businesses with this level of consumption have an option to have a high voltage customer connection or a low voltage connection.

There is a difference in the tariffs for this type of customers in Vanuatu: there is a specific low voltage business tariff for UNELCO, which includes a fixed monthly charge whereas VUI business customers requesting low voltage connection are charged at the same progressive tariff as a VUI small domestic customers which does not include a fixed charge.

However, VUI's Business customers having a high voltage connection will pay a fixed charge as identified below, similarly for a UNELCO business customer connected to a high voltage connection.

The bills for UNELCO and VUI HV customers, with the same connection and consumption, are also provided as customers with similar consumption patterns would be on high voltage connection in Vanuatu.

Figure 5: Comparison of bills paid by "Business consumers" across the Pacific region in Vt/kWh

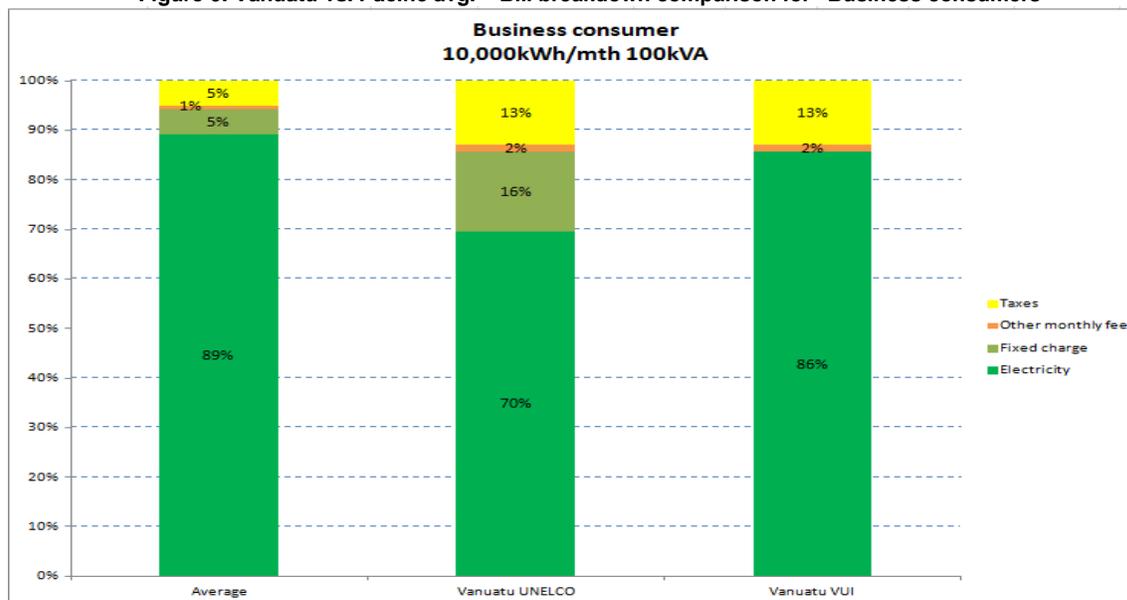


Source: URA

The electricity costs for the “business consumers” category in Vanuatu are, for VUI, 8% below regional average on HV connection and 19% above regional average on LV connection. UNELCO’s “business consumers” subscribing to HV connections is 15% above regional average while LV connections are 25% above regional average. A typical monthly bill paid by HV customers in Vanuatu is VUV 478,902 for VUI

customers and VUV 607,844 for UNELCO customers with the consumption level assumed. This is based on January 2019 prices with the assumption of a high voltage connection. UNELCO and VUI bills are compared to an average bill of VUV 516,670 for the Pacific area.

**Figure 6: Vanuatu vs. Pacific avg. – Bill breakdown comparison for “Business consumers”**



Source: URA

To make the above comparisons compatible to the Pacific region, the above chart (Figure 6) is showing bills for customers in Vanuatu with assumed consumption level on a LV connection provided in most of the Pacific region, a customer with the assumed consumption level would be on a LV connection rather than a HV connection.

The comparison between Vanuatu and the Pacific area shows that a higher proportion of the electricity bills in Vanuatu are made up of Government taxes. VAT (15%) comprised 13% share of the total electricity bill for this customer type when compared to a Pacific average of 5% tax. There are fixed charges for UNELCO customers with low voltage (LV) connection constituting 16% share of the total bill. There are no fixed charges for VUI customers with low voltage connection. This is compared to an average fixed charge of 5% across the Pacific region. Additionally, for Vanuatu, other monthly fees comprised of 2% of the overall total bill as compared to a 1% for the Pacific average.

Incidentally, for this customer type with high voltage (HV) connection in Vanuatu, the monthly fixed charge represents approximately 23% share of the total electricity bill for UNELCO customers and 20% share of total electricity bill for VUI customers based on the assumed subscription. Other monthly fees and taxes proportions in the total electricity bill are similarly shared as depicted in figure 6 above for customers on a low voltage connection.

### 3.4 Factors that impact electricity costs

#### 3.4.1 The generation mix

The available generation technologies making up the mix and the proportion of diesel-based generation both impact the price paid by the consumers for electricity services. Diesel-fuel based generation is amongst the most expensive ways of generating power. It would be beneficial to highlight that over the years, energy

regulation among other important functions, has undeniably played a very important role in facilitating the implementation of respective government policies which contributes to the push for obtaining optimal generation mix or 100% renewable electricity generation sources thus having a significant impact on the electricity prices. Table 3 below highlights countries where some forms of regulation have been applied to their respective energy sector.

However, where a country has greater reliance on diesel contribution in its overall generation mix, regulation may not fully mitigate the effect of high global fuel prices within respective local markets, therefore the electricity customers would still expect to pay higher bills.

The table below shows respective countries diesel contribution in the overall country's generation mix in 2018 and whether respective local electricity markets are subject to energy regulations.

**Table 3: Diesel contribution in energy generation mix in 2019 and energy regulation.**

Country	2018		Energy is regulated	Energy regulator
	Generation capacity in MW	Diesel contribution %		
American Samoa	45	98%	No	N/A
Cook Islands				Energy Regulation 2006' yet to come into force on date appointed by Minister and notified in Cook Islands Gazette.
Federated States of Micronesia	12	95%	No	N/A
Fiji	242	46.3%	Yes	Fiji Energy Authority (FEA)* & Fiji Competition & Consumer Commission (FCCC)
French Polynesia	186	70%		Commission de Regulation de l'Energie (CRE)
Guam	552	100%	Yes	Public Utility Commission (PUC)
Kiribati	8	52%	Yes	Public Utility Board (PUB) & Energy Resources and Conservation Board (ERCB)
Marshall Islands	32.2	90%	No	N/A
Nauru	10.7	96.8%	No	N/A
New-Caledonia	517	73.0%	Yes	Commission de Regulation de l'Energie (CRE)
Niue	2.08	87%	No	N/A
Palau	28.05	70.0%	No	N/A
PNG	580	24%	Yes	Independent Consumer and Competition Commission (ICCC)
Saipan	94.4	100.0%	No	N/A
Solomon Islands	33.60	97%	Yes	Solomon Islands Electricity Authority (SIEA)**
Tahiti	59	37%	Yes	Commission de Regulation de l'Energie (CRE)
Tonga	17.8	79%	Yes	Electricity Commission (EC)
Tuvalu	5	57%	No	N/A
Vanuatu UNELCO *	25.11	76%	Yes	Utilities Regulatory Authority (URA)
Vanuatu VUI *	4.24	71%	Yes	Utilities Regulatory Authority (URA)
Western Samoa	69.1	50%	Yes	Office of the Regulator

\* In Vanuatu, the two main electricity service providers (UNELCO and VUI) operate separate networks in different islands. The numbers shown in the table above reflect the operators' respective energy mix. UNELCO operates on three separate islands and figures reported above are representative of all three concession areas.

\*\* Where the utility as a SOE allocates resources to set their own standards to guide them in generation, transmission and distribution of electricity services.

### 3.4.2 Country characteristics

Besides the energy mix and diesel contribution, several country-specific characteristics affect final prices of electricity. We are highlighting a few for reader's consideration:

- Country's isolation and distance from mainland (impacts the need for redundancy, cost of logistic and time lag on repairs and maintenance);
- Geographical dispersion of the country (where islands spread over long distances and are not interconnected, each independent system has incompressible fixed costs and limited economy of scale potential);
- Availability of natural resources and alternatives for fuel-based electricity generation;
- Customer density and mix of residential, commercial and industrial users (affects system load factor, network development and operations costs, system losses, billings etc);

- Local labor rates, availability of skilled labor and social policies; and
- Country’s exposure to natural disasters and associated risk mitigation/prevention costs.

### 3.4.3 Other key determinants

This report has only reviewed the differences between customer bills for different electricity utilities in the Pacific. It has not considered or compared factors that can impact the reliability of electricity systems nor compare the performance of the utilities. These include:

- Reliability measures such as System Average Interruption Duration Index (SAIDI) or System Average Interruption Frequency Index (SAIFI), which indicate how reliable an electricity network is for its customers;
- Availability measures, as some electricity networks in the Pacific do not provide electricity 24 hours a day, 7 days a week;
- Quality measures such as voltage or frequency range;
- Ownership and cost-recovery, as the prices charged by some state-owned utilities across the Pacific do not cover the full costs of production given Government subsidies are prominent; and
- Aid donation and subsidization, as the impact of aid donation and subsidies will vary across the region, and will have an impact on costs.

The following table provides examples in the Pacific where these factors have an impact on electricity prices (as Reported by the participants):

Country	Observations
Fiji	<p>Fiji generates 50% of its electricity through hydro-electric power stations. Other factor that contributes to the low electricity price in Fiji is the use of HFO (Heavy fuel oil) for electricity generation. HFO is a waste product of the crude oil refinery process and it is a relatively inexpensive fuel<sup>4</sup>.</p> <p>“The Fijian Government has committed itself to assisting low-income household’s access the tremendous personal and economic benefits of electric power and, through EFL, actively subsidises electricity costs for families with a combined household income of \$30,000 or less. This allows residential customers to save 49% on the first 100 units of electricity usage per month at a rate of 15.90 cents per unit VAT exclusive price (VEP), resulting in a cost to customers of only 17.320 cents per unit (VEP).”<sup>5</sup></p>
Guam	<p>In Guam, GPA (Guam Power Authority) uses derivatives such as commodity-swaps to hedge itself against uncontrollable fluctuating fuel prices. Under or over recovery of fuel oil costs including the fair value of outstanding commodity swaps (if any) are recovered or deducted in future billings to customers based on the Levelized Energy Adjustment Clause (LEAC).</p> <p>The GPA’s hedging program also employs additional financial instruments and the use of the statistical model to measure risk and gauge the need to</p>

<sup>4</sup> [https://www.hfofreearctic.org/hrf\\_faq/price-heavy-fuel-oil-compared-alternative-fuels/](https://www.hfofreearctic.org/hrf_faq/price-heavy-fuel-oil-compared-alternative-fuels/)

<sup>5</sup> Energy Fiji Limited, 2018 Annual Report, page 30

	<p>establish or modify hedges. The GPA believes that, while a hedging program may result in higher costs than would otherwise be applicable during periods of declining oil prices it also provides price stability, which is beneficial to Guam’s electricity customers.</p>
<p>Vanuatu</p>	<p>In Vanuatu a cross-subsidy mechanism designed to support access and consumption of electricity for modest households impacts the various consumer bills. Consumers under the “Small domestic” category are paying low subsidised rates when their monthly consumption is between 0-60kWh. “Domestic consumers” (low voltage consumers) with monthly typical consumption of 60+ or 120+ kWh are paying a higher price per kWh as a result. The cross-subsidy mechanism is implemented by both utilities; UNELCO and VUI.</p> <p>It should also be noted that UNELCO tariffs are adjusted monthly to reflect current diesel prices. In January 2019, diesel cost/litre integrated in deriving tariff was higher (106.45 Vt/litre) compared to January 2018 prices (86.95 Vt/litre) as a result of the rise in global fuel prices during the second half of 2018.</p> <p>According to percentage figures<sup>6</sup> given below, for UNELCO's domestic customers, the price paid by these customers apart from the VAT of 15% and fixed charge of 3% as identified above include, fuel excise tax of approximately 8%, subsidy to Small Domestic Customers of approximately 3%, subsidy for Tanna and Malekula concessions of approximately 3% and funding for rural electrification approximately 3% are incorporated into the overall electricity bill.</p>

<sup>6</sup> Figures taken from UNELCO's letter with reference: N° 1549/16/U/WT/aw dated June 29<sup>th</sup> 2016. The URA currently does not have in possession enough data available to verify these figures.

## 4. Electricity price evolution over time

The following section focuses on electricity tariffs evolution across the Pacific region since July 2019, being the last release of this comparative report.

### 4.1 Small domestic consumers price evolution

In the "Small domestic consumers" category, the average January 2019 electricity prices in the region dropped / decreased by 1% since the time of the previous release comparing with January 2018 prices. Variations in the ranking were mostly driven by the depreciation of the US dollar against local currencies, although this decrease may be offset in certain countries by increase in diesel prices, that are delayed due to factors like; time lag of logistics behind transportation of fuel to respective countries, tariff adjustments, and usage reflected in customer bills. Countries largely relying on diesel for generation have seen significant rise in their tariffs ranging from 1% to 12%.

A drop of 10% in electricity bills was observed in Nauru, Kiribati and Tuvalu in the tariff applicable in January 2019 despite the increase in the international fuel price. Drop in Nauru is attributed to the ongoing non-taxable electricity bill which continues to subsidize this customer group and in addition to that, the depreciation of US dollar against local currency. The drop experienced by Kiribati and Tuvalu has also been attributed to by the depreciation of US dollar against their local currency.

In addition, this was also the same case in Fiji. Regardless of the rise in global Fuel price, Fiji still maintains its position in the 1<sup>st</sup> ranking position as the cheapest in the Pacific. A significant contributing factor to the lowest average bill experienced by Fiji's Small domestic Consumer is the ongoing national Government subsidy injected into their Small Domestic Consumer's category.

Small domestic consumers						
Country	January Bill 2019	Ranking 2019	January Bill 2018	Ranking 2018	Tariff Variation	Ranking shift
Fiji	640	1	668	1	-4%	0
Nauru	1,189	2	1,326	4	-10%	2
Vanuatu VUI	1,242	3	1,108	2	12%	-1
Vanuatu UNELCO	1,307	4	1,180	3	11%	-1
FSM - Pohnpei	1,439	5	1,439	5	0%	0
Tuvalu	1,513	6	1,689	7	-10%	1
Palau	1,638	7	1,638	6	0%	-1
Tahiti	1,717	8	1,848	10	-7%	2
French Polynesia	1,730	9	1,862	11	-7%	2
Tonga	1,755	10	1,829	9	-4%	-1
Saipan	1,790	11	1,790	8	0%	-3
Western Samoa	2,033	12	2,006	12	1%	0
PNG	2,038	13	2,130	13	-4%	0
Kiribati	2,068	14	2,308	15	-10%	1
Marshall Islands	2,295	15	2,295	14	0%	-1
<b>Average</b>	<b>2,491</b>		<b>2,520</b>		<b>-1%</b>	
Cook Islands	2,729	16	2,947	20	-7%	4
FSM - Yap Island	2,821	17	2,821	17	0%	0
Guam	2,901	18	2,901	19	0%	1
American Samoa	2,993	19	2,746	16	9%	-3
FSM - Kosrae	3,081	20	2,886	18	7%	-2
New-Caledonia	3,166	21	3,426	22	-8%	1
FSM - Chuuk	3,264	22	3,264	21	0%	-1
Niue	3,358	23	3,626	23	-7%	0
Solomon Islands	6,022	24	5,720	24	5%	0
FSM - Falalop	7,540	25	7,540	25	0%	0

Source: URA

## 4.2 Domestic consumers price evolution

The “Domestic consumers” category has shown a decrease in average prices over the period by 0.9%.

For this customer group, a significant drop in electricity prices were observed for Kiribati, Nauru and Tuvalu at 10% while Cook Islands, Niue, New Caledonia, Tahiti and French Polynesia follow at 7%. PNG, Fiji and Tonga experience drop in prices by 4% only. The reason behind these different drops is because of the different depreciation rate of US dollar against the respective country's local currencies.

American Samoa and Vanuatu’s UNELCO, on the other hand, increased by 11% each; this is because of their increase in tariff to cater for the increased observed in global fuel prices. FSM - Kosrae and Vanuatu -VUI both increased by 6%; that also is because the tariff was adjusted to capture increase in global fuel prices. Solomon Islands and Western Samoa increased by 5% and 1% respectively. They both have regular Fuel Adjustment mechanism which then increase tariff based on the increased global fuel price. Overall, the fact that most customers in this category in the region experienced a decrease in their electricity prices has pulled the overall pacific average bill downwards.

Domestic consumers						
Country	January Bill 2019	Ranking 2019	January Bill 2018	Ranking 2018	Tariff variation	Ranking shift
Fiji	4,884	1	5,097	1	-4%	0
FSM - Pohnpei	5,340	2	5,340	2	0%	0
Saipan	5,853	3	5,853	3	0%	0
Guam	7,870	4	7,870	4	0%	0
Nauru	7,925	5	8,843	6	-10%	1
Palau	8,093	6	8,093	5	0%	-1
Tahiti	8,943	7	9,626	7	-7%	0
PNG	9,520	8	9,951	8	-4%	0
Western Samoa	10,163	9	10,028	9	1%	0
French Polynesia	10,316	10	11,104	11	-7%	1
Marshall Islands	11,476	11	11,476	12	0%	1
Tuvalu	12,131	12	13,536	15	-10%	3
American Samoa	12,311	13	11,078	10	11%	-3
New-Caledonia	12,374	14	13,338	14	-7%	0
Tonga	12,472	15	12,998	13	-4%	-2
<b>Average</b>	<b>13,543</b>		<b>13,661</b>		<b>-0.9%</b>	
Niue	13,804	16	14,906	17	-7%	1
Kiribati	14,384	17	16,050	20	-10%	3
FSM - Yap Island	14,794	18	14,794	16	0%	-2
Vanuatu VUI	15,552	19	14,689	19	6%	0
Cook Islands	16,162	20	17,453	22	-7%	2
FSM - Kosrae	16,291	21	15,313	18	6%	-3
FSM - Chuuk	17,368	22	17,368	21	0%	-1
Vanuatu UNELCO	24,281	23	21,948	23	11%	0
Solomon Islands	29,687	24	28,195	24	5%	0
FSM - Falalop	36,592	25	36,592	25	0%	0

Source: URA

## 4.3 Business consumers price evolution

The average tariff charged to Business consumers across the region dropped by 0.9% over the period. Nauru, Kiribati and Tuvalu tariffs have dropped by 10%; Cook Islands, Niue, Tahiti, New Caledonia and French Polynesia have dropped by 7% and Western Samoa dropped 5% while PNG, Fiji and Tonga dropped by 4%. Additionally, the depreciation of US dollar against local currency have shown drop in bills for this customer category which continues to show the commitment to support the local economy as low electricity cost would lower production cost thus attracting more investors and encouraging more business activities.

On the other hand, UNELCO LV and HV tariff increased by 11%, American Samoa increased by 10% and Solomon Islands, Vanuatu VUI HV and FSM - Kosrae increased by 6% respectively while VUI LV increased by 5%.

Again the drop in price for one business consumer for a utility may go in opposite direction for another utility because of the reasons as one being the cost allocation methods impacting the tariff structure. The time lag by which these countries passed on these drops or rise in fuel prices are monthly for American Samoa, Solomon Islands and Unelco (Vanuatu). On a quarterly basis, we have Fiji while Guam is on a bi-annual basis. PNG and VUI's (Vanuatu) prices are adjusted on annual basis.

Business consumers						
Country	January Bill 2019	Ranking 2019	January Bill 2018	Ranking 2018	Tariff variation	Ranking shift
Fiji	230,028	1	240,071	2	-4%	1
FSM - Pohnpei	236,239	2	236,239	1	0%	-1
Guam	243,049	3	243,049	3	0%	0
Saipan	297,539	4	297,539	4	0%	0
New-Caledonia	339,815	5	365,751	6	-7%	1
Palau	355,008	6	355,008	5	0%	-1
Western Samoa	359,662	7	378,254	7	-5%	0
PNG	363,793	8	380,257	8	-4%	0
Tonga	415,719	9	433,263	10	-4%	1
American Samoa	435,253	10	394,157	9	10%	-1
Marshall Islands	448,874	11	448,874	11	0%	0
Tahiti	456,173	12	490,990	13	-7%	1
French Polynesia	460,044	13	495,156	14	-7%	1
Tuvalu	465,984	14	519,957	15	-10%	1
Vanuatu VUI HV	478,902	15	451,895	12	6%	-3
<b>Average</b>	<b>516,670</b>		<b>521,461</b>		<b>-0.9%</b>	
Niue	520,440	16	562,011	17	-7%	1
Nauru	554,743	17	618,997	21	-10%	4
FSM - Kosrae	578,671	18	546,056	16	6%	-2
FSM - Chuuk	602,148	19	602,148	19	0%	0
FSM - Yap Island	606,838	20	606,838	20	0%	0
Vanuatu UNELCO HV	607,844	21	549,403	18	11%	-3
Kiribati	610,218	22	680,897	24	-10%	2
Vanuatu VUI LV	640,009	23	609,830	22	5%	-1
Cook Islands	661,145	24	713,955	25	-7%	1
Vanuatu UNELCO LV	684,612	25	618,766	23	11%	-2
Solomon Islands	975,807	26	918,564	26	6%	0
FSM - Falalop	1,321,524	27	1,321,524	27	0%	0

Source: URA

## 4.4 Factors that impact electricity price over time

In the Pacific region, most of the generation capacity is diesel fueled. This makes fuel cost the main variable impacting the price of electricity, although not all countries are passing these fluctuations to their customers at the same pace and concurrent with the volatile movement in the international fuel.

For utilities in the Pacific Island Countries that are passing the fuel price variations onto their electricity consumers, the time gap observed varies between countries. This is driven by the fuel supply chain and the country's characteristics. The key drivers are the distance from the port of origin, supply route, the local demand for diesel, the storage capacities and the billing cycles. Storage capacity may impact the time lag between the time when prices are changing on the international oil market and the day the prices are reflected in local electricity prices.

In Vanuatu for example, the change in fuel price occurs when fuel from the previous fuel delivery is fully exhausted from the storage, using first-in first out inventory method (FIFO). This means that based on how much stock is left in the storage the day the tanker lands at the wharf, the impact of the reduced fuel price may be delayed further.

The billing cycle adopted by the utility company, or the time elapsed between the day the utility is using cheaper diesel in generation and the day the customers are billed based on the reduced fuel price may increase the time lag in price transfer again.

All together it is observed that there is a three to four months time lag of price transfer in Vanuatu, a process we detailed in the URA's monitoring report "Diesel Pricing for Electricity Services" released in April 2017. Copy of the report is available on the URA's website with updated versions to it.

In order to avoid distortions in the comparison of shifts in rankings over time, the exchange rates are kept constant using spot exchange rate to recalculate the corresponding bills for last report. However, fluctuations are only partly neutralized as the costs related to imported fuels and materials are impacted by currency fluctuations and fully reflected in the current tariffs used to calculate the bills. The lack of details in the proportion of operating costs being impacted by currency variations may introduces a bias in subsequent analysis.

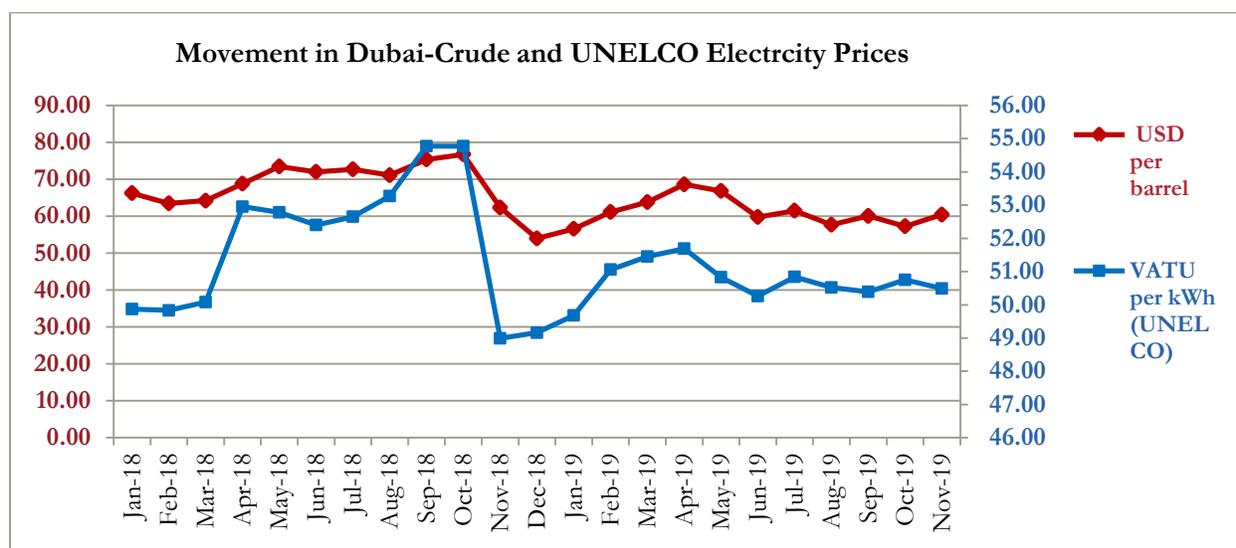
## 5. Conclusions

Based on the comparison of customer bills, the overall picture for Vanuatu is mixed, with significant differences in the relative position depending on customer category:

- Small domestic customers in Vanuatu are charged significantly less than the regional average due to cross-subsidy from large and business customers and is more pronounced in Vanuatu than in any other parts of the Pacific region;
- Other low voltage domestic customers, which means relatively high domestic users in Vanuatu are charged significantly more than the regional average and are subsidizing the low users; and
- Business customers in Vanuatu are differentiated between two utilities; VUI is charging HV customers below average Pacific rate while its LV customers pay above Pacific average rate. UNELCO charging its LV and HV customers slightly higher prices than Pacific average based on the type of connection and the customer type the customer is subscribed to. It should be noted that UNELCO electricity prices are adjusted monthly reflecting current invoiced fuel prices while VUI's prices are adjusted annually.

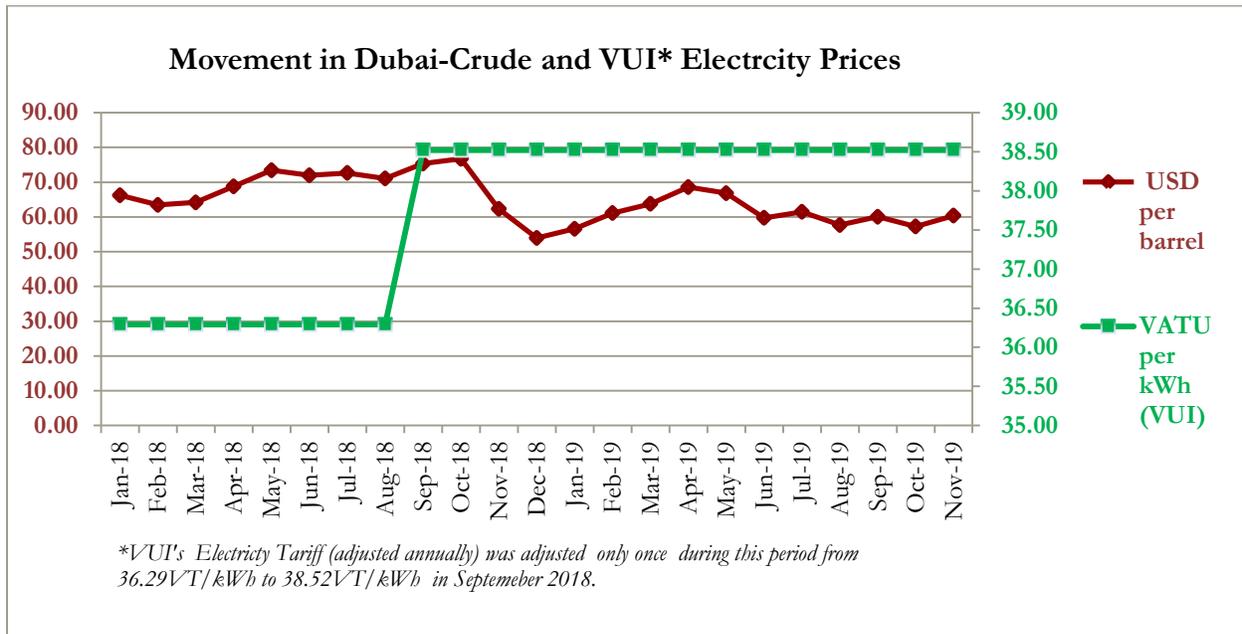
This seventh release of the URA's Electricity tariff comparison report reflects a steady movement in world oil prices throughout 2018 with a fall in the last quarter of 2018, slowly rising again in the first quarter of 2019 as shown in the below chart (Dubai Crude price movement).

The movement in the UNELCO's<sup>7</sup> electricity price is more correlated to the Dubai-Crude price as it is adjusted monthly, as opposed to VUI's price adjusted annually. Both charts below depict the differences.



Source: Argus Media Limited & URA

<sup>7</sup> The UNELCO data used here are for the period March 2018 to February 2020 to account for the 3 months time lag from which international oil price is embedded into local fuel prices which in turn affects electricity prices.



Source: Argus Media Limited & URA.

While the depreciation of US dollar against certain countries currency like Vanuatu helps to absorb international price shock which may have been experienced otherwise, it also highlights the fact that risks and exposure to currency fluctuations in most countries of the region remains, with little to no hedging measures adopted. Such risks may also be mitigated with the increasing contribution of renewable energy sources in the energy mix of the respective countries.

Rising diesel prices has pushed countries to venture into wanting more renewable energy sources than fossil fuel in their generation mix. The resulting effect in Vanuatu shows Government, Utilities and development partner's pledge and commitment into increasing renewable energy penetration into overall generation mix such as Solar, Wind and hydro. However, this pose concerns expressed by the utilities that increase in Solar and Wind (intermittent renewable) may give rise to grid instability which in turn may require additional investments to encourage grid stability which can impact tariffs.

In all, the Authority believes this report has given some insight to readers about the electricity prices across the pacific island nation. The Authority wishes to thank everyone involved with the regulatory agencies and utility companies across the region who graciously helped us compiled the information to issue this report.

# Annexe I. Electricity bill breakdown

Country	Fiji	Palau	American Samoa	Western Samoa	PNG	New-Caledonia	Kiribati	Tuvalu	Niue	Nauru	Marshall Islands	Solomon Islands
<b>Small domestic consumer</b>												
Average use per month	60 kWh											
Amperage	1.1 kVa											
Electricity in VUV	1,050	1,307	2,330	1,988	1,351	1,983	1,902	1,498	2,238	1,189	2,295	5,249
Gov't Subsidy	505											
Fixed charge in VUV	-	332	663	-	502	419	-	-	1,119	-	-	773
Other monthly fee in VUV	-	-	-	-	-	613	-	-	-	-	-	-
Taxes in VUV	95	-	-	44	185	151	166	15	-	-	-	-
Estimated bill in VUV	640	1,638	2,993	2,033	2,038	3,166	2,068	1,513	3,358	1,189	2,295	6,022
<b>Domestic consumer</b>												
Average use per month	300 kWh											
Amperage	3.3 kVa											
Electricity in VUV	5,252	7,761	11,648	9,279	8,153	9,915	13,076	11,610	12,685	7,925	11,476	28,141
Gov't Subsidy	841											
Fixed charge in VUV	-	332	663	-	502	1,257	-	-	1,119	-	-	1,546
Other monthly fee in VUV	-	-	-	-	-	613	-	-	-	-	-	-
Taxes in VUV	473	-	-	884	865	589	1,308	521	-	-	-	-
Estimated bill in VUV	4,884	8,093	12,311	10,163	9,520	12,374	14,384	12,131	13,804	7,925	11,476	29,687
<b>Business consumer</b>												
Average use per month	10,000 kWh											
Amperage	100 kVa											
Electricity in VUV	211,035	353,792	388,265	312,750	330,119	231,812	554,743	443,795	519,321	554,743	448,874	952,613
Gov't Subsidy	-	-	-	-	-	-	-	-	-	-	-	-
Fixed charge in VUV	-	1,216	46,988	-	602	91,085	-	-	1,119	-	-	23,193
Other monthly fee in VUV	-	-	-	-	-	735	-	-	-	-	-	-
Taxes in VUV	18,993	-	-	46,912	33,072	16,182	55,474	22,190	-	-	-	-
Estimated bill in VUV	230,028	355,008	435,253	359,662	363,793	339,815	610,218	465,984	520,440	554,743	448,874	975,807

Country	Tonga	Cook Islands	FSM - Chuuk	FSM - Kosrae	FSM - Pohnpei	FSM - Yap Island	FSM - Falalop	Saipan	Guam	Tahiti	French Polynesia	Vanuatu UNELCO HV	Vanuatu VUI HV
<b>Small domestic consumer</b>													
Average use per month	60 kWh												
Amperage	1.1 kVa												
Electricity in VUV	2,494	2,373	3,109	3,081	929	2,521	7,263	1,016	1,242	1,077	1,201	1,118	1,063
Gov't Subsidy	739												
Fixed charge in VUV	-	-	-	-	442	166	276	774	1,658	305	305	-	-
Other monthly fee in VUV	-	-	-	-	-	-	-	-	-	253	142	20	19
Taxes in VUV	-	356	155	-	69	134	-	-	-	82	82	168	159
Estimated bill in VUV	1,755	2,729	3,264	3,081	1,439	2,821	7,540	1,790	2,901	1,717	1,730	1,307	1,242
<b>Domestic consumer</b>													
Average use per month	300 kWh												
Amperage	3.3 kVa												
Electricity in VUV	12,472	16,162	16,541	16,291	4,644	13,923	36,316	5,079	6,211	7,125	7,741	19,881	13,292
Gov't Subsidy													
Fixed charge in VUV	-	-	-	-	442	166	276	774	1,658	129	1,373	904	-
Other monthly fee in VUV	-	-	-	-	-	-	-	-	-	1,264	711	378,281,631	265,848
Taxes in VUV	-	-	827	-	254	704	-	-	-	426	491	3,118	1,994
Estimated bill in VUV	12,472	16,162	17,368	16,291	5,340	14,794	36,592	5,853	7,870	8,943	10,316	24,281	15,552
<b>Business consumer</b>													
Average use per month	10,000 kWh												
Amperage	100 kVa												
Electricity in VUV	415,719	574,536	573,475	578,671	132,672	577,499	1,320,971	296,433	224,704	355,986	376,524	383,400	307,800
Gov't Subsidy	-	-	-	-	-	-	-	-	-	-	-	-	-
Fixed charge in VUV	-	373	-	-	89,554	442	553	1,106	18,345	36,336	37,916	136,925	102,149
Other monthly fee in VUV	-	-	-	-	2,764	-	-	-	-	42,129	23,697	9,470	7,461
Taxes in VUV	-	86,236	28,674	-	11,249	28,897	-	-	-	21,723	21,907	78,049	61,492
Estimated bill in VUV	415,719	661,145	602,148	578,671	236,239	606,838	1,321,524	297,539	243,049	456,173	460,044	607,844	478,902

## Utilities Regulatory Authority

### Vanuatu

You can access the Pacific Region Electricity Bills Comparison Report 2017 on our website [www.ura.gov.vu](http://www.ura.gov.vu), or by contacting us by telephone (+678) 23335, email: [breuben@ura.gov.vu](mailto:breuben@ura.gov.vu) or regular mail at Comparative Report "Electricity price – Pacific area" Utilities Regulatory Authority, PMB 9093, Port Vila, Vanuatu.