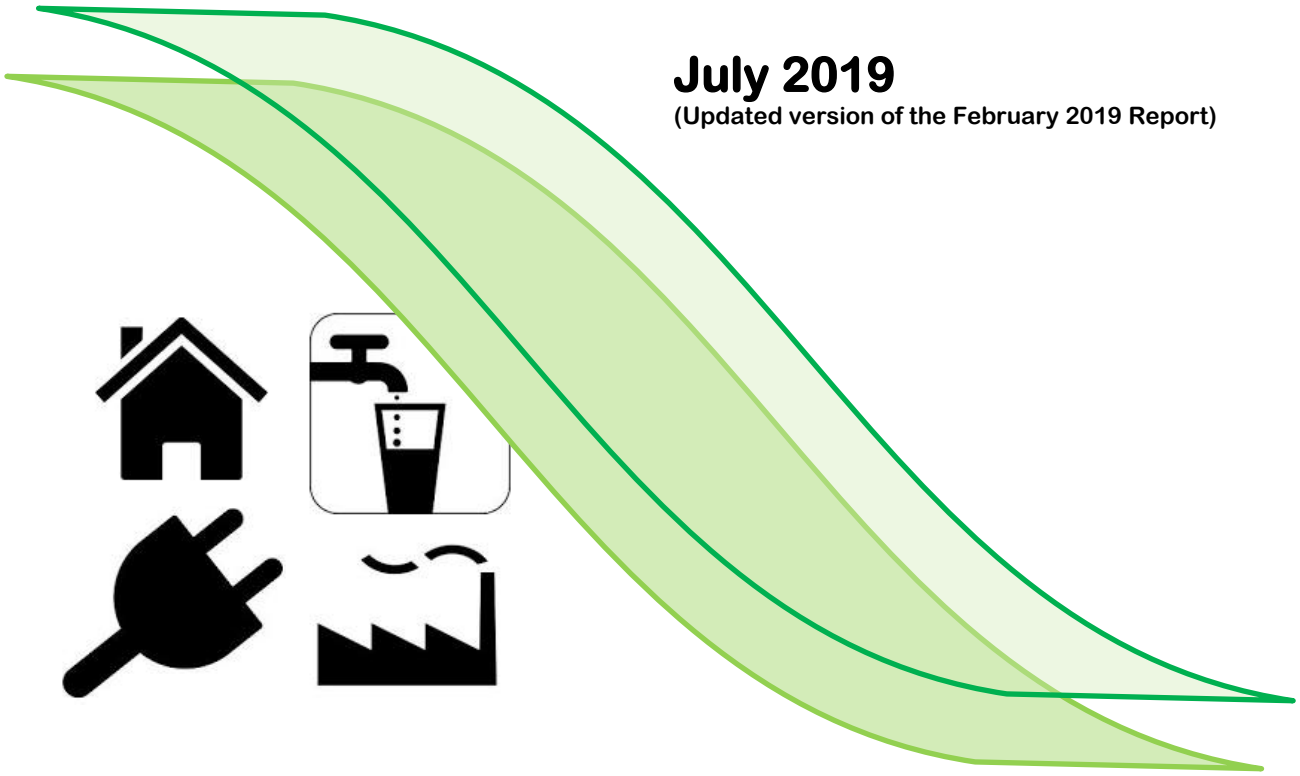
Utilities Regulatory Authority

Comparative Report

Pacific Region Electricity Bills



July 2019
(Updated version of the February 2019 Report)

Letter from the CEO

This is the sixth Electricity Price Comparison report of the Utilities Regulatory Authority (the 'Authority') for the small pacific island countries and territories.

It has been our effort 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 major 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 regime applicable 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 2018, since the trend in rankings is only meaningful by holding exchange rates constant at the last version of the report.

The bill comparison study is marked by a rise in raw fuel prices in the global markets during the second half of 2017 as shown in the Dubai Fateh Price[1] and reflected in the January 2018 electricity prices used in making the electricity price comparisons. The rise in fuel prices results in increased consumer energy prices across the Pacific region. However due to transportation and logistics of the fuel supply chain from refinery port (Singapore) to the Pacific islands, the timing of the impact was varied and not immediate. The delay in fuel price rise differs for each country 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 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 rising diesel price to electricity consumers as diesel and other derivative products are globally priced in US dollar.

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

I welcome any suggestions to improve future analysis and reports.

Sincerely,

John Obed Alilee
CEO, Utilities Regulatory Authority of Vanuatu

[1] http: //www.indexmundi.com/commodities/?commodity=crude-oil-dubai&months=60

Contents

List of tables and Figures

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 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 have also vary widely between electricity suppliers across the Pacific which affects electricity pricing but is simply a comparison of the electricity prices based on different customer categories in the different pacific small islands. The availability of natural resources, the generation-mix, the nature of the terrain, and the level of subsidies, utility efficiencies, 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 June 2017, time of our last release of this report comparing January 2017 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
- EEC New-Caledonia: http://www.eec.nc/
- Fiji Electricity Authority: 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
- Tonga Power Ltd.: http://www.tongapower.to
- Tuvalu Electricity Corporation: http://www.tectuvalu.tv
- Vanuatu Utilities Regulatory Authority: www.ura.gov.vu
- UNELCO ENGIE: https://www.unelco.engie.com

2. Methodology

This section describes the methodology 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 utilities and regulatory agencies most of whom data were obtained from for preceding versions of the comparative report. For those whereby no response was received, the staff relied on the latest data available on the respective 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 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 utilities in the Pacific region.

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[2] in different islands countries and territories in the Pacific region have been collected and reviewed.

Tariff information published publicly by regulatory agencies or the utilities was 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:

- "Small domestic consumers" are households that only use small amounts of electricity in a given month. There are over 12,704 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 5,008 customers of this type in Vanuatu, with an average consumption of 300 kWh per month;

[2] 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. Therefore, the electricity prices depicted in this report does not merely present an average price from different electricity companies that are operating within a country, but rather shows the price of a single utility company.

- "Business consumers" are commercial and industrial customers. There are approximately 1,646 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

Small domestic customer		
Consumption per month	60	kWh
Subscribed capacity	1.1	kVA
Domestic customer (Other low voltage)		
Consumption per month	300	kWh
Subscribed capacity	3.3	kVA
Business customer		
Consumption per month	10,000	kWh
Subscribed capacity	100	kVA
Power factor conversion		
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. Note that 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 currencies. 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[3], and then from USD to VUV using ANZ exchange spot rate (sourced locally); both conversions were picked on a single spot date - 20th of January 2018. This avoids impact of day-to-day

[3] http://www.oanda.com/currency/converter/20thJan2018

currency fluctuations, and allows for ease of comparison when analyzing previous and current years report, billing amounts collected from 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 from previous report) were kept unchanged so assessment of electricity price changes over time is achievable.

Table 2: Exchange rates as of 20th January 2018

Country	Exchange rate 1 FX = VUV	Exchange rate 1 Fx = USD
Fiji	52.506	0.499
Palau	105.165	1.000
American Samoa	105.165	1.000
Western Samoa	41.837	0.398
PNG	33.251	0.316
New-Caledonia	1.078	0.010
Kiribati	84.113	0.800
Tuvalu	84.113	0.800
Niue	76.643	0.729
Nauru	84.113	0.800
Marshall Islands	105.165	1.000
Solomon Islands	14.039	0.133
Tonga	48.405	0.460
Cook Islands	76.643	0.729
FSM - Chuck	105.165	1.000
FSM - Kosrae	105.165	1.000
FSM - Pohnpei	105.165	1.000
FSM - Yap Island	105.165	1.000
FSM - Falalop	105.165	1.000
Saipan	105.165	1.000
Guam	105.165	1.000
Tahiti	1.078	0.010
French Polynesia	1.078	0.010
Vanuatu UNELCO	1.000	0.010
Vanuatu VUI	1.000	0.010

Source: Oanda currency converter

2.4 Taxes and government subsidies

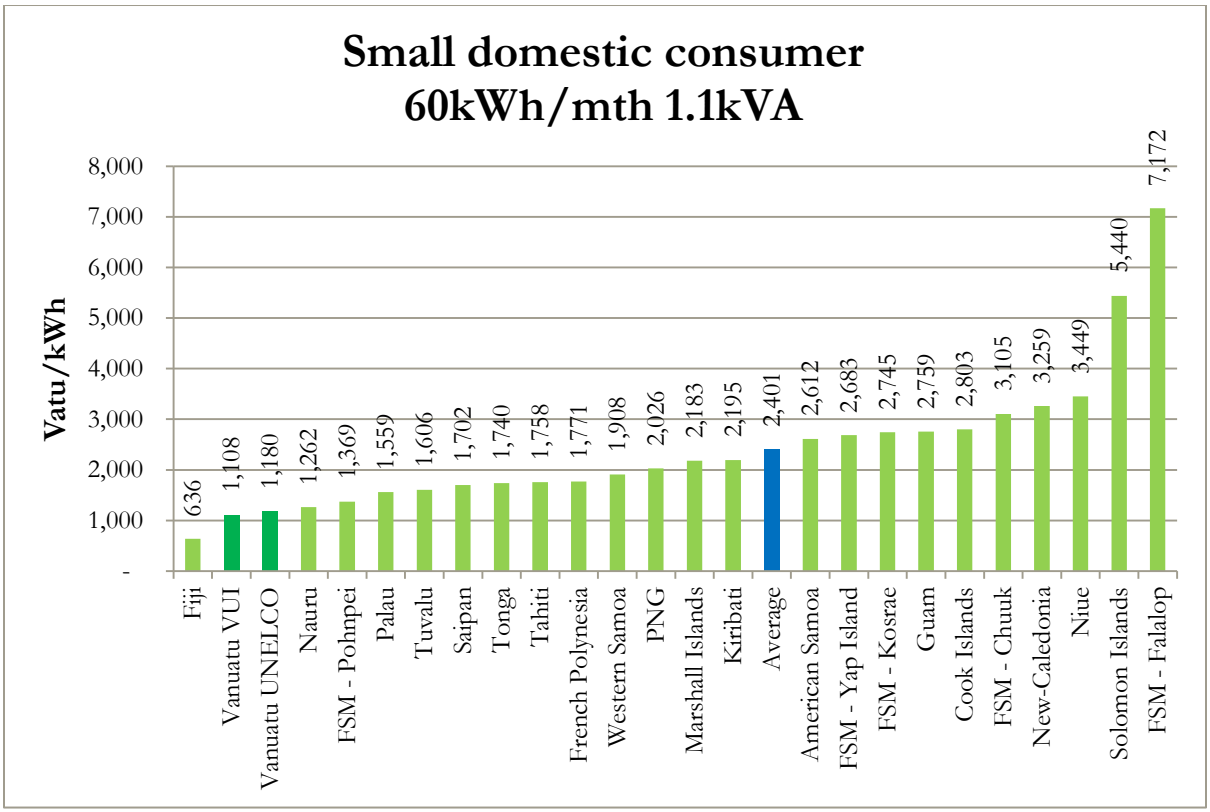
Taxes and government subsidies on the price of electricity are factors that electricity suppliers have no control over other than to include them on customer bills. In order to compare electricity costs from a customer standpoint, all applicable taxes, fees and other charges included in an electricity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

3. Electricity price comparison and analysis

3.1 Small domestic consumers category

The following chart shows the total bill for monthly consumption of 60kWh on a 5A connection from the 25 electricity utilities across the Pacific region.

Figure 1: Comparison of bills paid by "Small domestic consumers" across the Pacific region in VUV/kWh



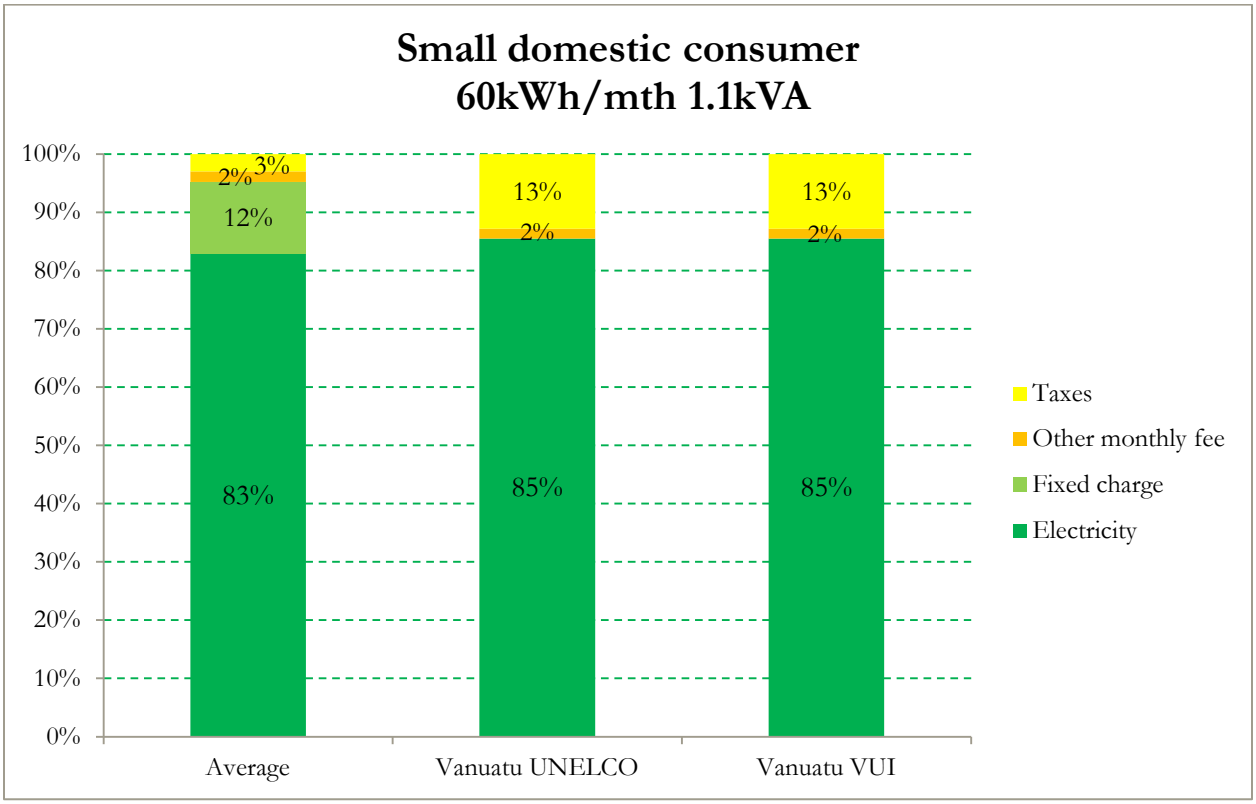
Source: URA

The electricity costs for the "small domestic consumers" category in Vanuatu are among the cheapest in the Pacific region, with VUI and UNELCO ranking 2nd and 3rd respectively out of the 25 utilities in the sample. The typical bill paid for these customers in Vanuatu is VUV 1,108 for VUI[4] customers, and VUV 1,180 for UNELCO customers, based on January 2018 prices. This compares to an average bill of VUV 2,401 for the Pacific area. VUI and UNELCO are 54% and 51% respectively below the Pacific average.

In Vanuatu, bills of Small Domestic Customers are way cheaper compared to bills of customers in the same category throughout other pacific island nations as per figure 1 above. It has been a 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 to the low-income earners.

[4] This report uses the same VUI tariff rate effective as of February 2017 up to August 2018. 2018 VUI revised tariff Commission Order was issued in September 2018. The VUI January 2018 Price increase was due to the 2.5% increase in Government Taxes to 15% in 2018 and the inclusion of the Regulatory Levy to fund the Authorities operations.

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. It is worth mentioning that in Vanuatu effective as of January 2018, the previous level of the applicable Value Added Tax (VAT) of 12.5% was increased by 2.5% to 15%, affecting all prices of goods and services. (Therefore, the 13% that forms the relatively higher proportion of the electricity bill in Vanuatu is the tax component, compared to a Pacific average of 3% tax). You can always revert to the last Comparative report to compare the increase in tax portion in the customer electricity bills.

The January 2018 electricity prices for the first time ever in the Vanuatu's bill breakdown comprises of a regulatory fee[5], captured under 'Other monthly fee' as observed in VUI and UNELCO which was imposed in the middle of the 2017[6]. The regulatory fee under the monthly fee as mandated by Act of Parliament in Vanuatu constituted 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 13% 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.

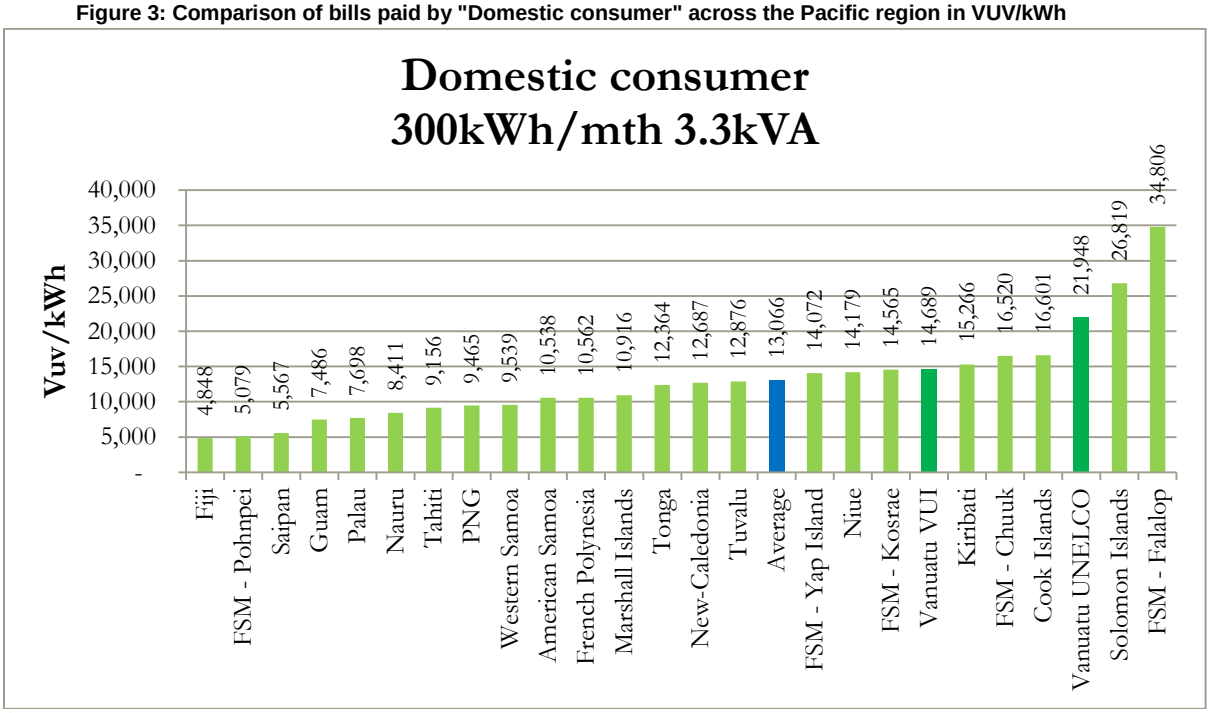
[5] In Vanuatu, a Regulatory Fee capped at 2% is mandated by law to be collected from all utility customers applied on electricity and water bills. The imposition of the regulatory fees was endorsed by parliament and was officially implemented in mid-2017 to allow the Office of the Authority to sustain its operations as a result of cessation of initial grant money from donor partners.

[6] The Regulatory fee component was not captured in the January 2017 price comparison report as it was initiated after the report has been issued.

3.2 Domestic consumer category

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

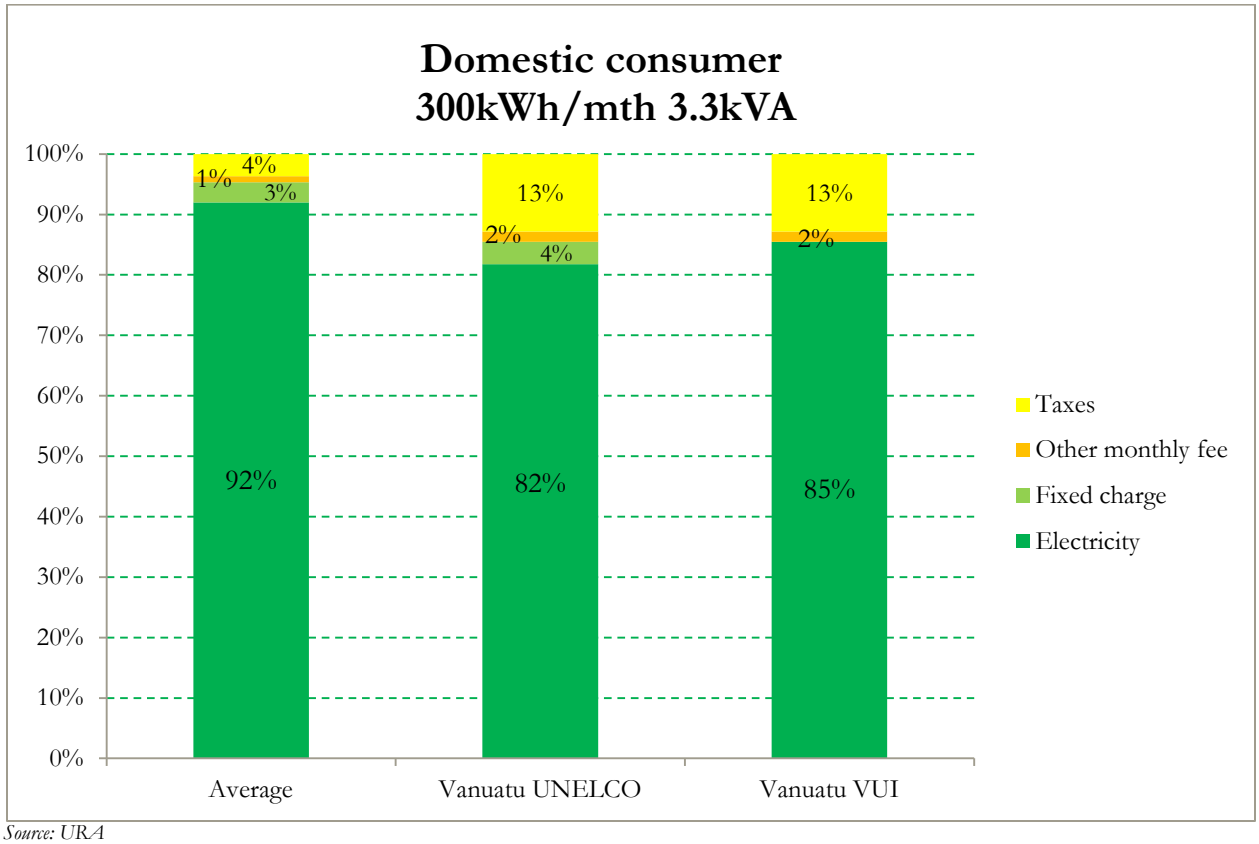
Figure 3: Comparison of bills paid by "Domestic consumer" across the Pacific region in VUV/kWh



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 23rd and VUI - 19th, out of the 25 utilities in the sample. VUI has moved from 17th to the 19th while UNELCO has maintained its position from 2017 to 2018 in the ranking. Both utilities' tariffs were affected by the above mentioned 2.5% increase in the local VAT as well as the inclusion of the Regulatory Levy in customer invoices. UNELCO, in addition to the VAT and regulatory fees, experienced the full effect of the increase in international fuel prices increase. The typical monthly bill paid for these customers in Vanuatu is VUV 21,948 for UNELCO customers, and VUV 14,689 for VUI customers, based on January 2018 electricity prices. This compares to an average bill of VUV 13,066 for the Pacific area. UNELCO is 68% above the Pacific average, and VUI is 12% 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 than generally for others. Vanuatu customers pay 15% VAT charged on all electricity bills. This constitutes 13% of the overall customer bills when compared to a Pacific average of 4% tax as depicted in Figure 4 above.

In Vanuatu, there are fixed charges for UNELCO's 'domestic customers' of 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

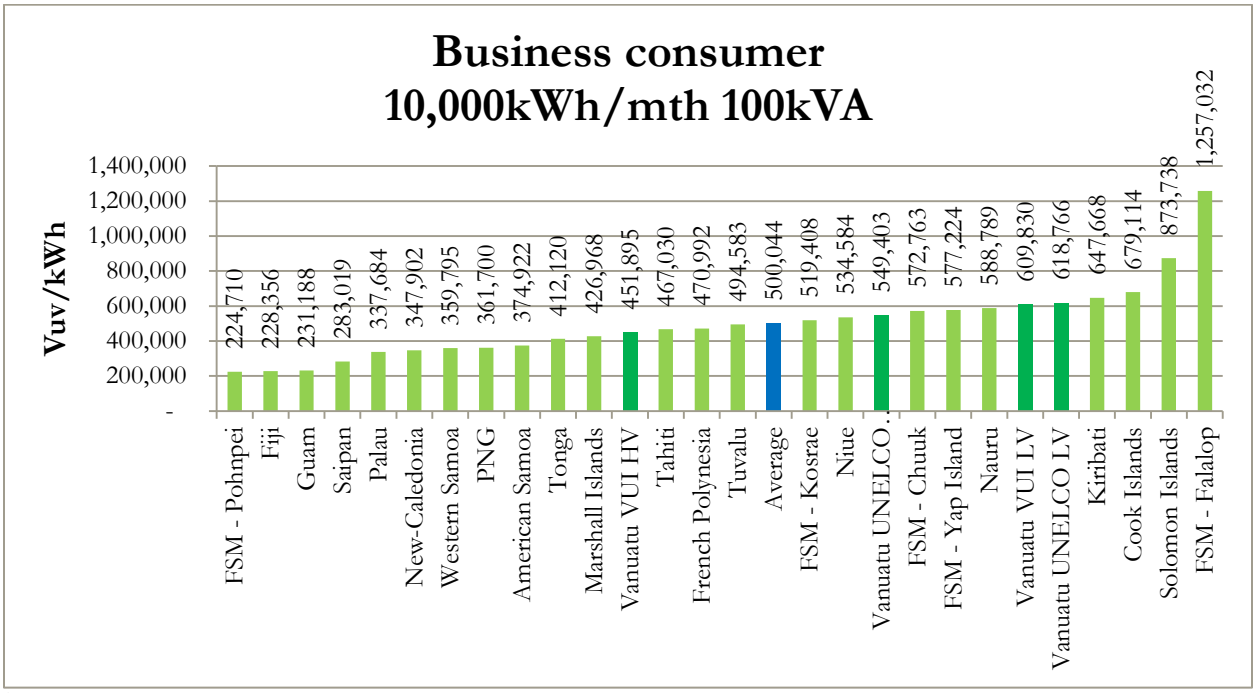
The following chart shows the total bill for a commercial customer with a monthly consumption of 10,000kWh on a 100kVA connection for the sample of 25 electricity companies across the Pacific region. Businesses with this level of consumption have an option to have a high voltage customer connection or 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.

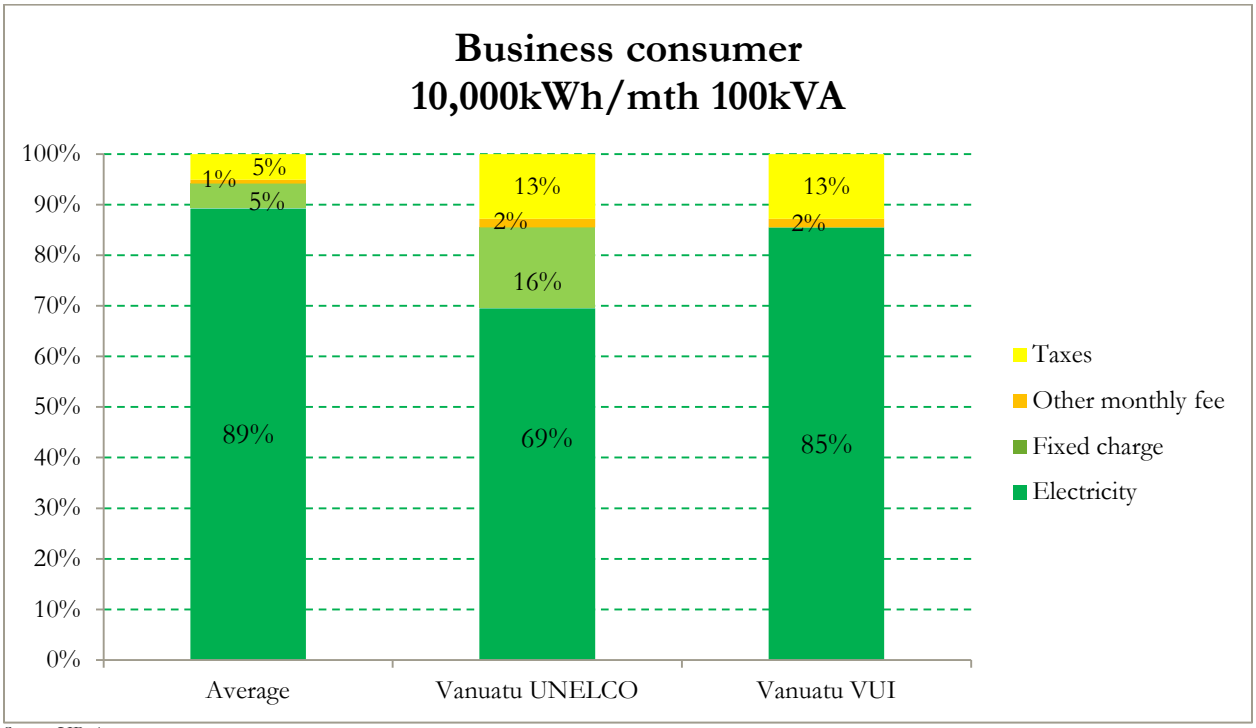
Figure 5: Comparison of bills paid by "Business consumers" across the Pacific region in Vt/kWh



Source: URA

The electricity costs for the "business consumers" category in Vanuatu are, for VUI, 10% below regional average on HV connection and 22% above regional average on LV connection. UNELCO's "business consumers" subscribing to HV connections is 10% above regional average while LV connections are 24% above regional average. A typical monthly bill paid by HV customers in Vanuatu is VUV 451,895 for VUI customers and VUV 549,403 for UNELCO customers with the consumption level assumed. This is based on January 2018 prices with the assumption of a high voltage connection. UNELCO and VUI bills are compared to an average bill of VUV 500,044 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) for Vanuatu is showing bills for customers 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% composition 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 constitute 16% 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% of the total electricity bill for high voltage UNELCO customers and 19% fixed charge for high voltage 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, and therefore had a significant impact on the electricity prices. The Table 3 below has been extended in this year's report to reflect the countries where some form of regulations 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 3 below shows respective countries diesel combination in the overall country's generation mix in 2017 and whether respective local electricity markets are subject to energy regulations.

Table 3: Diesel contribution in energy generation mix in 2017 and energy regulation.

Country	2017		Energy is regulated	Energy regulator
	Generation capacity in MW	Diesel contribution %		
American Samoa	45	98%	No	N/A
Cook Islands	15	85%	No	N/A
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%	Yes	Commission de Regulation de l'Energie (CRE)
Guam	552	100%	Yes	Public Utility Commission (PUC)
Kiribati	8	52%	Yes	Pulic Utility Board (PUB)** & Energy Resources and Conservation Board (ERCB)
Marshall Islands	32.2	90%	No	N/A
Nauru	6.5	96.8%	No	N/A
New-Caledonia	517	73.0%	Yes	Commission de Regulation de l'Energie (CRE)
Niue	2.2	87%	No	N/A
Palau	29.4	98.5%	No	N/A
PNG	580	24%	Yes	Independent Consumer and Competition Commission (ICCC)
Saipan	94.4	100.0%	No	N/A
Solomon Islands	27	45%	Yes	Solomon Islands Electrcity Authority (SIEA)**
Tahiti	59	37%	Yes	Commission de Regulation de l'Energie (CRE)
Tonga	16.5	87%	Yes	Electricity Commission (EC)
Tuvalu	5	57%	No	N/A
Vanuatu UNELCO *	27.60	82.9%	Yes	Utilities Regulatory Authority (URA)
Vanuatu VUI *	4.17	31.47%	Yes	Utilities Regulatory Authority (URA)
Western Samoa	69.1	50%	Yes	Office of the Regulator

* In Vanuatu, the two 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 energy. 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);
- 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 study 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	Fiji generates 50% of its electricity through hydro-electric power stations. The Fiji Electricity Authority (FEA) incurred significant non-commercial obligation (NCO) costs each year when supplying subsidised electricity to rural Viti Levu and the whole of Vanua Levu and Ovalau. These reached a total of FJD $13.4M in 2017 (FJD 27.4M in 2016). Although the Public Enterprises Act requires the Fijian government to reimburse the NCO costs to FEA, these have apparently not been refunded. Instead the government has accepted that FEA's non-commercial contribution to social and community services through its electricity subsidies is to be recognised as its annual dividend to the government. Additionally, other factor that contributes to the low electricity price in Fiji is that, Fiji uses the 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[7].
Guam	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

[7] https://www.hfofreearctic.org/hrf_faq/price-heavy-fuel-oil-compared-alternative-fuels/

	billings to customers based on the Levelized Energy Adjustment Clause (LEAC). The increase in tariff reflect the global prices for the first six months in 2017 which are then adjusted based on the LEAC by the Public Utility Commission on a bi-annual basis.
Vanuatu	In Vanuatu a cross-subsidy mechanism designed to support access to electricity services for modest households impacts the various consumer bills. Consumers under the "Small domestic" category are paying low subsidised rates in the first tranche of 0-60kWh. "Domestic consumers" are paying a higher price per kWh as a result. The cross-subsidy mechanism is implemented by both utilities. It should also be noted that UNELCO tariffs are adjusted monthly to reflect current diesel prices. In January 2018, diesel cost/litre integrated in deriving tariff was higher compared to January 2017 prices resulting in increase of tariffs for all end users. According to percentage figures[8] 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, 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% which are incorporated into the overall electricity bill.

[8] Figures taken from UNELCO's letter with reference: N° 1549/16/U/WT/aw dated June 29th 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 the last release of this comparative report.

4.1 Small domestic consumers price evolution

In the "Small domestic consumers" category, the average January 2018 electricity prices in the region had remain steady since the time of the previous release comparing of January 2017. Variations in the ranking were mostly driven by the increase in diesel prices since last release, although this increase may be offset in certain countries by a depreciation of the US dollar currency against local currencies or delayed due to 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 4% to 17%.

A significant drop of 28% in electricity bills was observed in Tonga despite the increase of 4.85% from previous tariff applicable in 2017 which was attributed by the under-recovery of fuel cost and also the ongoing increase in the international fuel price. Regardless, Tongan Small Domestic Consumer's have not felt the increase as they were subsidized by their Government causing the overall electricity bill to drop by 28%.

In addition, this is also the same case as in Fiji. Regardless of the 17% rise due to rise in global Fuel price, Fiji still maintains its position in the 1st ranking position to be the cheapest in the Pacific. A significant contributing factor to the lowest average bill experienced by Fiji's Small domestic Consumer is that the national Government injected subsidy into their Small Domestic Consumer's category.

Small domestic consumers						
Country	January Bill 2018	Ranking 2018	January Bill 2017	Ranking 2017	Tariff Variation	Ranking shift
Fiji	636	1	542	1	17%	0
Vanuatu VUI	1,108	2	1,065	3	4%	1
Vanuatu UNELCO	1,180	3	1,044	2	13%	-1
Nauru	1,262	4	1,350	4	-7%	0
FSM - Pohnpei	1,369	5	1,369	6	0%	1
Palau	1,559	6	1,647	5	-5%	-1
Tuvalu	1,606	7	1,606	7	0%	0
Saipan	1,702	8	1,702	10	0%	2
Tonga	1,740	9	2,411	16	-28%	7
Tahiti	1,758	10	1,758	8	0%	-2
French Polynesia	1,771	11	1,771	9	0%	-2
Western Samoa	1,908	12	2,083	13	-8%	1
PNG	2,026	13	2,026	12	0%	-1
Marshall Islands	2,183	14	2,183	15	0%	1
Kiribati	2,195	15	2,271	14	-3%	-1
Average	2,401		2,401		0%	
American Samoa	2,612	16	2,382	17	10%	1
FSM - Yap Island	2,683	17	2,794	20	-4%	3
FSM - Kosrae	2,745	18	2,545	18	8%	0
Guam	2,759	19	2,563	11	8%	-8
Cook Islands	2,803	20	2,803	19	0%	-1
FSM - Chuuk	3,105	21	2,899	22	7%	1
New-Caledonia	3,259	22	3,330	21	-2%	-1
Niue	3,449	23	3,449	23	0%	0
Solomon Islands	5,440	24	5,253	24	4%	0
FSM - Falalop	7,172	25	7,172	25	0%	0

Source: URA

4.2 Domestic consumers price evolution

The "Domestic consumers" category has shown an increase in average prices over the period by 3.4%. A drop in electricity prices were observed for Western Samoa with 8%. The reasons are that Western Samoa reduces its debt charges and revised its tariff structure into a 2 tier structure which target domestic consumers

whose consumptions are less than 50kWh per month receiving a lifeline tariff, while a slightly lower rate is applied for monthly consumptions of up to 100kWh.

Nauru, on the other hand, increased by 25% while Guam by 15%. FSM - Chuuk, UNELCO and American Samoa increase by 14%, 13% and 12% respectively while FSM - Kosrae increased by 7%. Overall, the fact that most customers in this category experienced an increase in their electricity prices has pulled the overall pacific average bill upwards.

Domestic consumers						
Country	January Bill 2018	Ranking 2018	January Bill 2017	Ranking 2017	Tariff variation	Ranking shift
Fiji	4,848	1	4,620	2	5%	1
FSM - Pohnpei	5,079	2	5,079	3	0%	1
Saipan	5,567	3	5,567	4	0%	1
Guam	7,486	4	6,504	1	15%	-3
Palau	7,698	5	8,140	6	-5%	1
Nauru	8,411	6	6,750	5	25%	-1
Tahiti	9,156	7	9,156	7	0%	0
PNG	9,465	8	9,465	11	0%	3
Western Samoa	9,539	9	10,417	10	-8%	1
American Samoa	10,538	10	9,385	9	12%	-1
French Polynesia	10,562	11	10,562	8	0%	-3
Marshall Islands	10,916	12	10,916	12	0%	0
Tonga	12,364	13	12,056	14	3%	1
New-Caledonia	12,687	14	13,016	13	-3%	-1
Tuvalu	12,876	15	12,876	15	0%	0
Average	13,066		12,634		3.4%	
FSM - Yap Island	14,072	16	14,182	19	-1%	3
Niue	14,179	17	14,179	18	0%	1
FSM - Kosrae	14,565	18	13,565	16	7%	-2
Vanuatu VUI	14,689	19	14,124	17	4%	-2
Kiribati	15,266	20	15,613	21	-2%	1
FSM - Chuuk	16,520	21	14,496	20	14%	-1
Cook Islands	16,601	22	16,601	22	0%	0
Vanuatu UNELCO	21,948	23	19,410	23	13%	0
Solomon Islands	26,819	24	24,361	24	10%	0
FSM - Falalop	34,806	25	34,806	25	0%	0

Source: URA

4.3 Business consumers price evolution

The average tariff charged to Business consumers across the region increased by 3.0% over the period. In several instances the tariff structures have been adjusted along with fuel compensation variables to reflect the changes. Western Samoa and Nauru tariffs have dropped by 8% and 7% respectively, this showing a 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, Fiji tariff increased by 46%, Guam and American Samoa increased by 16% and 14% respectively. UNELCO LV and HV increased by 13%, while FSM - Chuuk increased by 11%.

Again the drop in price for one business consumer for a utility may go in opposite direction compared to other utilities 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 (Vanuatu) usually adjust their prices on an annual basis.

Business consumers						
Country	January Bill 2018	Ranking 2018	January Bill 2017	Ranking 2017	Tariff variation	Ranking shift
FSM - Pohnpei	224,710	1	224,710	3	0%	2
Fiji	228,356	2	156,047	2	46%	0
Guam	231,188	3	200,112	1	16%	-2
Saipan	283,019	4	283,019	4	0%	0
Palau	337,684	5	352,407	6	-4%	1
New-Caledonia	347,902	6	347,903	5	0%	-1
Western Samoa	359,795	7	389,080	10	-8%	3
PNG	361,700	8	361,700	8	0%	0
American Samoa	374,922	9	328,282	7	14%	-2
Tonga	412,120	10	401,858	9	3%	-1
Marshall Islands	426,968	11	426,968	14	0%	3
Vanuatu VUI HV	451,895	12	434,514	13	4%	1
Tahiti	467,030	13	467,030	11	0%	-2
French Polynesia	470,992	14	470,992	12	0%	-2
Tuvalu	494,583	15	494,583	15	0%	0
Average	500,044		485,267		3.0%	
FSM - Kosrae	519,408	16	486,071	17	7%	1
Niue	534,584	17	534,584	19	0%	2
Vanuatu UNELCO HV	549,403	18	485,831	16	13%	-2
FSM - Chuuk	572,763	19	516,337	18	11%	-1
FSM - Yap Island	577,224	20	577,335	22	0%	2
Nauru	588,789	21	630,005	23	-7%	2
Vanuatu VUI LV	609,830	22	586,375	21	4%	-1
Vanuatu UNELCO LV	618,766	23	547,223	20	13%	-3
Kiribati	647,668	24	662,388	24	-2%	0
Cook Islands	679,114	25	679,114	25	0%	0
Solomon Islands	873,738	26	800,700	26	9%	0
FSM - Falalop	1,257,032	27	1,257,032	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 fuel price changes internationally.

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.

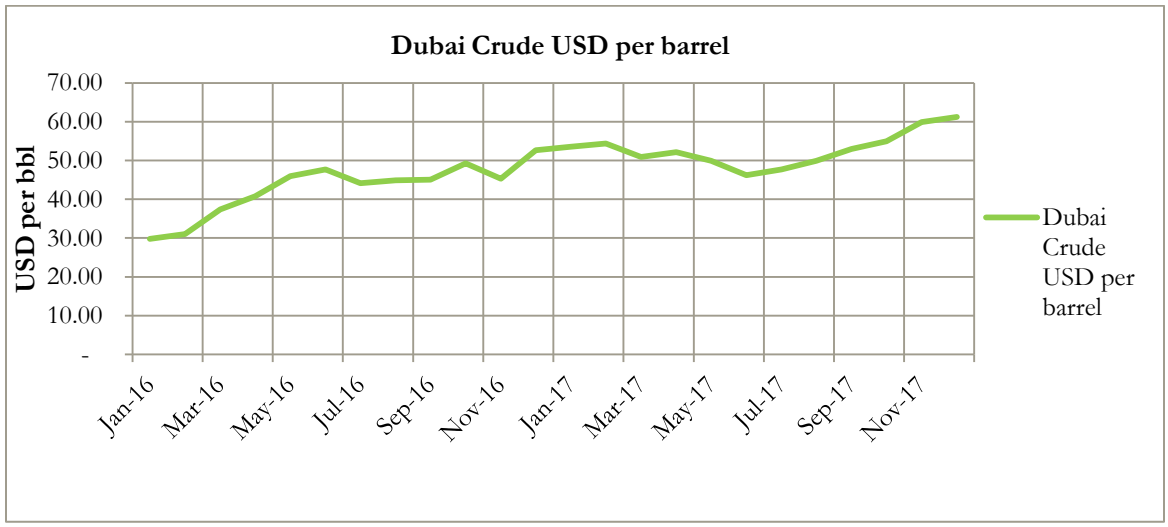
In order to avoid distortions in the comparison of shifts in rankings over time, the exchange rates are kept constant using spot exchange rate to recalculate the corresponding bills for last report. However, fluctuations are only partly neutralized as the costs related to imported fuels and materials 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 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 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 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 sixth release of the URA's Electricity tariff comparison report reflects a rise in diesel prices as seen in the global markets during the second half of 2017 as shown in the Argus Media Limited.



Source: Argus Media Limited

The appreciation of US dollar currency against certain countries like Vanuatu adds to the increasing international price of diesel resulting in higher electricity price. This highlights the risks and exposure to currency fluctuations in most countries of the region with no or limited 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.

Another effect to be expected from the rise of diesel prices is the push to venture into renewable energy sources competing against fossil fuel generation. 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 the electricity prices across the pacific island nation. The Authority wishes to thank all the persons 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
	USD/FJD			USD/WST	USD/PGK	USD/XPF	USD/AUD	USD/AUD	USD/NZD	USD/AUD		USD/SBD
Exchange rate 1Fx = VUV	53	105.1646	105.1646	41.83657557	33.25094735	1.078279504	84.11277145	84.11277145	76.64292997	84.11277145	105.1646	14.03947355
Exchange rate 1Fx = USD	0.5	1	1	0.397819947	0.316180039	0.010253255	0.7998202	0.7998202	0.728790201	0.7998202	1	0.133499995
Electricity	1,043	1,243	1,981	1,866	1,343	2,030	2,019	1,590	2,299	1,262	2,183	4,702
Gov't Subsidy	- 501											
Fixed charge	-	315	631	-	499	429	-	-	1,150	-	-	739
Other monthly fee	-	-	-	-	-	645	-	-	-	-	-	-
Taxes	94	-	-	41	184	155	177	16	-	-	-	-
Estimated bill	636	1,559	2,612	1,908	2,026	3,259	2,195	1,606	3,449	1,262	2,183	5,440
Domestic consumer												
Average use per month	300 kWh											
Amperage	3.3 kVa											
Electricity	5,214	7,383	9,907	8,709	8,106	10,151	13,879	12,323	13,029	8,411	10,916	25,341
Gov't Subsidy	- 835											
Fixed charge	-	315	631	-	499	1,287	-	-	1,150	-	-	1,477
Other monthly fee	-	-	-	-	-	645	-	-	-	-	-	-
Taxes	469	-	-	829	860	604	1,388	553	-	-	-	-
Estimated bill	4,848	7,698	10,538	9,539	9,465	12,687	15,266	12,876	14,179	8,411	10,916	26,819
Business consumer												
Average use per month	10,000	kWh										
Amperage	100	kVa										
Electricity	209,501	336,527	330,227	312,865	328,220	237,329	588,789	471,032	533,435	588,789	426,968	851,578
Gov't Subsidy	-											
Fixed charge	-	1,157	44,695	-	599	93,253	-	-	1,150	-	-	22,160
Other monthly fee	-	-	-	-	-	753	-	-	-	-	-	-
Taxes	18,855	-	-	46,930	32,882	16,567	58,879	23,552	-	-	-	-
Estimated bill	228,356	337,684	374,922	359,795	361,700	347,902	647,668	494,583	534,584	588,789	426,968	873,738

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
Small domestic consumer													
Average use per month	60	kWh											
Amperage	1.1	kVa											
Electricity in VUV	2,473	2,437	2,957	2,745	883	2,398	6,909	966	1,182	1,103	1,229	1,009	947
Gov't Subsidy	- 733												
Fixed charge in VUV	-	-	-	-	421	158	263	736	1,577	312	312	-	-
Other monthly fee in VUV	-	-	-	-	-	-	-	-	-	259	146	20	19
Taxes in VUV	-	366	148	-	65	128	-	-	-	84	84	151	142
Estimated bill in VUV	1,740	2,803	3,105	2,745	1,369	2,683	7,172	1,702	2,759	1,758	1,771	1,180	1,108
Domestic consumer													
Average use per month	300 kWh												
Amperage	3.3 kVa												
Electricity in VUV	12,364	16,601	15,734	14,565	4,417	13,244	34,543	4,831	5,908	7,295	7,925	17,943	12,554
Gov't Subsidy													
Fixed charge in VUV	-	-	-	-	421	158	263	736	1,577	132	1,406	816	-
Other monthly fee in VUV	-	-	-	-	-	-	-	-	-	1,294	728	375.1719	251.088
Taxes in VUV	-	-	787	-	242	670	-	-	-	436	503	2,814	1,883
Estimated bill in VUV	12,364	16,601	16,520	14,565	5,079	14,072	34,806	5,567	7,486	9,156	10,562	21,948	14,689
Business consumer													
Average use per month	10,000	kWh											
Amperage	100	kVa											
Electricity in VUV	412,120	590,151	545,489	519,408	126,198	549,317	1,256,507	281,967	213,738	364,458	385,485	346,000	290,000
Gov't Subsidy													
Fixed charge in VUV	-	383	-	-	85,183	421	526	1,052	17,450	37,201	38,818	123,575	96,235
Other monthly fee in VUV	-	-	-	-	2,629	-	-	-	-	43,131	24,261	9,392	7,725
Taxes in VUV	-	88,580	27,274	-	10,700	27,487	-	-	-	22,240	22,428	70,436	57,935
Estimated bill in VUV	412,120	679,114	572,763	519,408	224,710	577,224	1,257,032	283,019	231,188	467,030	470,992	549,403	451,895

Utilities Regulatory Authority

Vanuatu

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