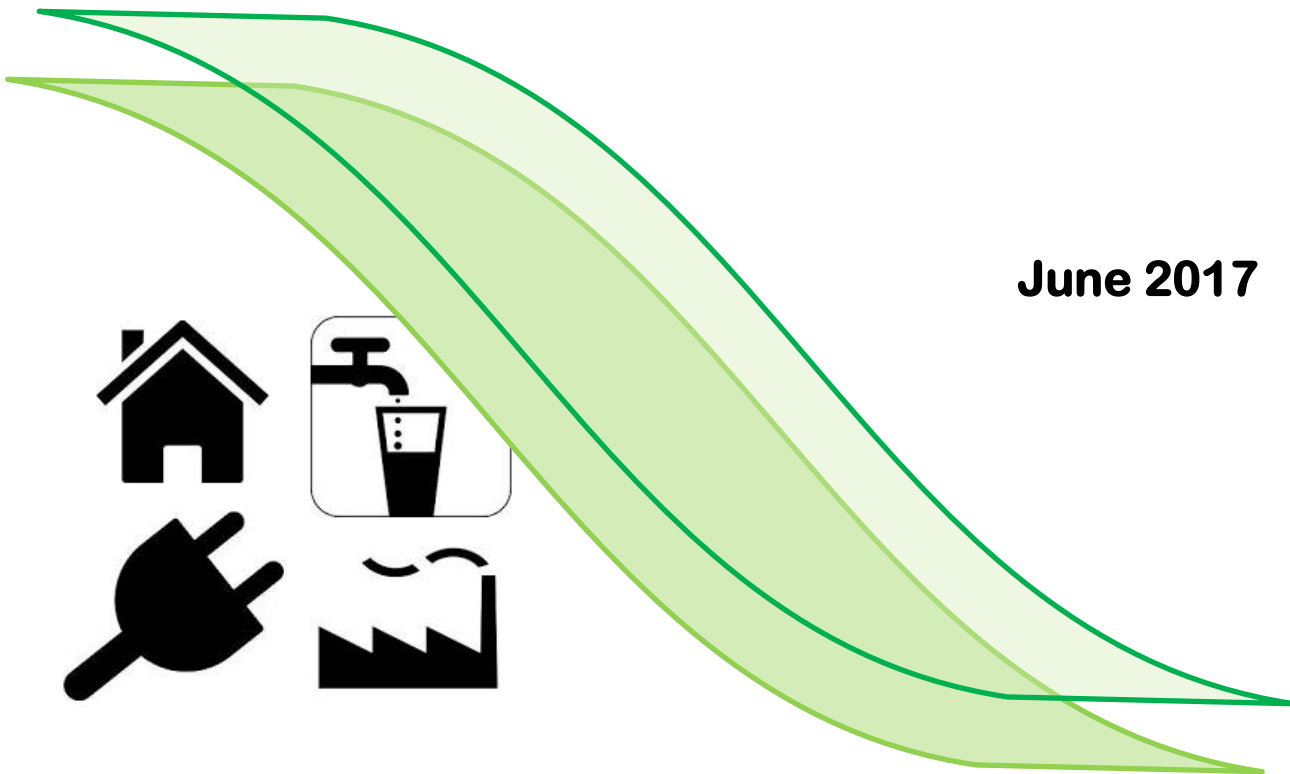


**Utilities
Regulatory
Authority**

Comparative Report

Pacific Region Electricity Bills



Letter from the CEO

This is the fifth Electricity Price Comparison report of the Utilities Regulatory Authority (URA) for the small Pacific island countries and territories.

It has been our effort to conduct this annual exercise to gather, compile and disseminate current electricity pricing. 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, energy infrastructure investments, and renewable energy contribution and efficiency efforts 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 2017, since the trend in rankings is only meaningful by holding exchange rates constant at the last version of the report.

This year's Bill comparison study is marked by a rise in raw fuel prices in the global markets during the second half of 2016 as shown in the Dubai Fateh Price¹. This report captures the rise in fuel prices resulting in increase in 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 storage capacities. 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, thereby further increasing costs of rising diesel price to electricity consumers as diesel and other derivative products are 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,

Hasso Bhatia, PhD

CEO, Utility Regulatory Authority of Vanuatu

¹ <http://www.indexmundi.com/commodities/?commodity=crude-oil-dubai&months=12>

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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 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 prices on different customer categories in different Pacific small islands. The availability of natural resources, the generation-mix, the nature of the terrain, and the level of subsidies, taxes and tariff policies all contributed to the structural price differences between the Pacific island nations. Data used is based on publicly available information on electricity rates for different utilities 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 2016, time of our last release of this report.

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: www.ura.gov.vu

2. Methodology

This section describes the methodology used to compare the Pacific region electricity costs, the analysis and findings presented in this report. 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. Therefore this report is based on a comparison of bills, using three typical customer consumption categories outlined in Sub-section 2.2 below and are applied across utilities in the Pacific region.

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 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 of price differences.

2.1 Scope

Information from 25 electricity utilities in different islands and territories in the Pacific region have been collected and reviewed. In our previous report, our exercise covered only 24 electricity utilities. In this fifth report however, French Polynesia is added onto the list to distinguish it from Tahiti. Recognising Tahiti as one heavily populated island yet within the French Polynesia territory, and having a separate tariff charged apart from French Polynesia, it is appropriate to have it isolated from French Polynesia for electricity price comparison purposes.

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. There are over 11,000 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 5,000 customers of this type in Vanuatu, with an average consumption of 300 kWh per month;
- “Business consumers” are commercial and industrial customers. There are approximately 1,700 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
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 source², and then from USD to VUV using ANZ exchange spot rate; both conversions were picked on a single spot date - 20th of January 2017. This avoids impact of day-to-day 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.

² <http://www.oanda.com/currency/converter/20thJan2017>

Table 2: Exchange rates as of 20th January 2017

Country	Exchange rate 1 FX = VUV	Exchange rate 1 Fx = USD
Fiji	52.107	0.481
Palau	108.269	1.000
American Samoa	108.269	1.000
Western Samoa	42.388	0.392
PNG	34.279	0.317
New-Caledonia	0.968	0.009
Kiribati	81.827	0.756
Tuvalu	81.827	0.756
Niue	77.622	0.717
Nauru	81.827	0.756
Marshall Islands	108.269	1.000
Solomon Islands	13.846	0.128
Tonga	47.269	0.437
Cook Islands	77.622	0.717
FSM - Chuck	108.269	1.000
FSM - Kosrae	108.269	1.000
FSM - Pohnpei	108.269	1.000
FSM - Yap Island	108.269	1.000
FSM - Falalop	108.269	1.000
Saipan	108.269	1.000
Guam	108.269	1.000
Tahiti	0.968	0.009
French Polynesia	0.968	0.009
Vanuatu UNELCO	1.000	0.009
Vanuatu VUI	1.000	0.009

Source: Oanda currency converter

2.4 Taxes and government subsidies

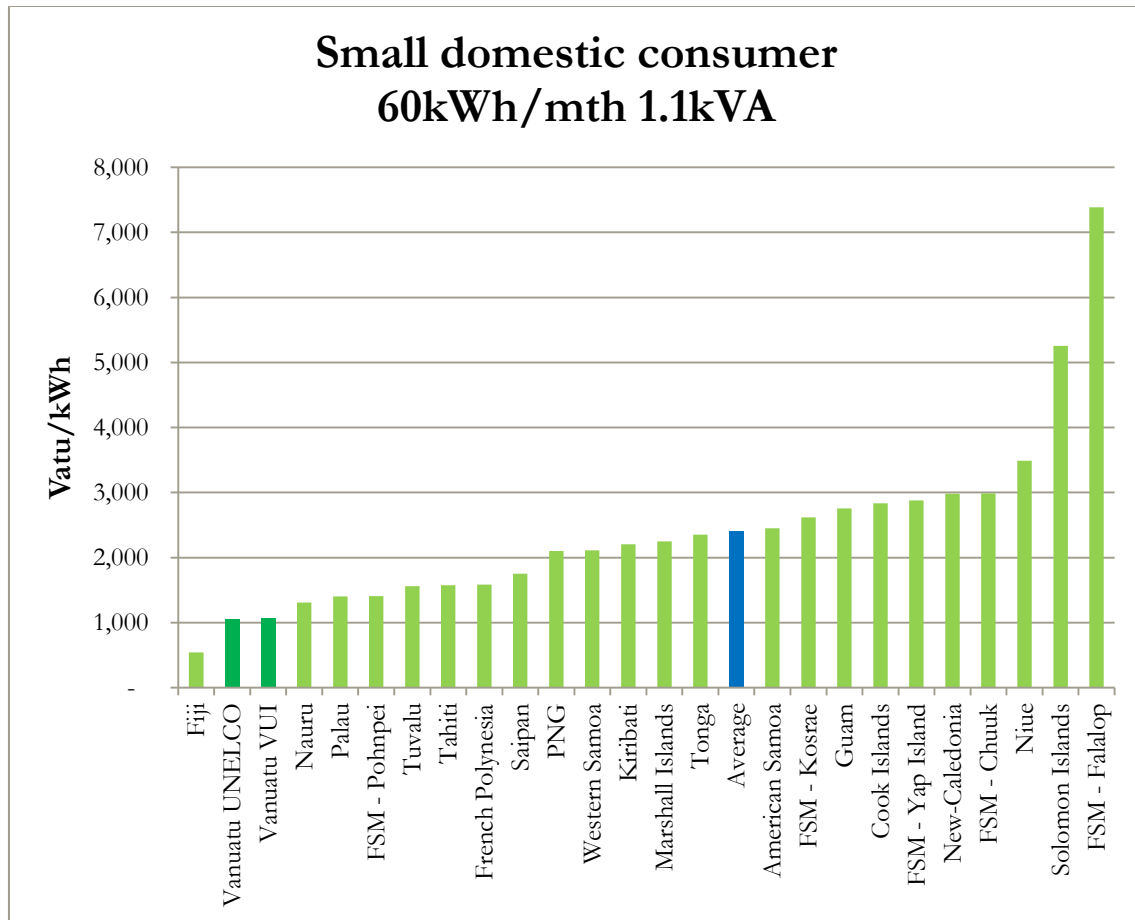
Taxes and government subsidies on the price of electricity are factors that electricity suppliers have no control over other than to include them on customer bills. In order to compare electricity costs from a customer standpoint, all applicable taxes, fees and other charges included in an electricity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

3. Electricity price comparison and analysis

3.1 Small domestic consumers category

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

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



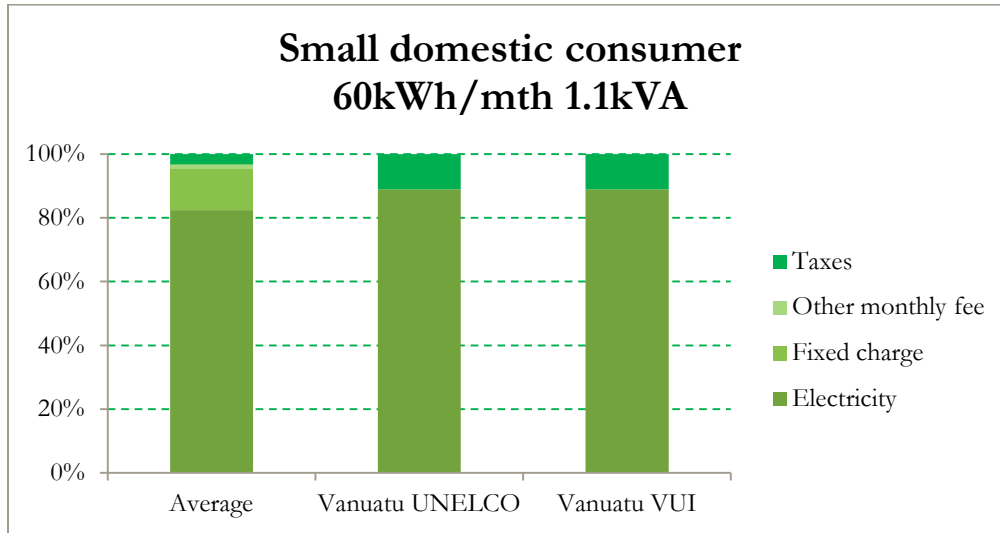
Source: URA

The electricity costs for the “small domestic consumers” category in Vanuatu are among the cheapest in the Pacific region, with UNELCO and VUI ranking 2nd and 3rd respectively out of the 25 utilities in the sample. The typical bill paid for these customers in Vanuatu is VUV 1,044 for UNELCO customers, and VUV 1,065 for VUI³ customers, based on January 2017 prices. This compares to an average bill of VUV 2,396 for the Pacific area. UNELCO and VUI are 56% and 55% 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 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.

³ VUI revised tariff commission order issued in January 2017. Tariff becomes effective February 2017.

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. This consists of 12.5% Value Added Tax (VAT) charged on all electricity bills, compared to a Pacific average of 3% tax.

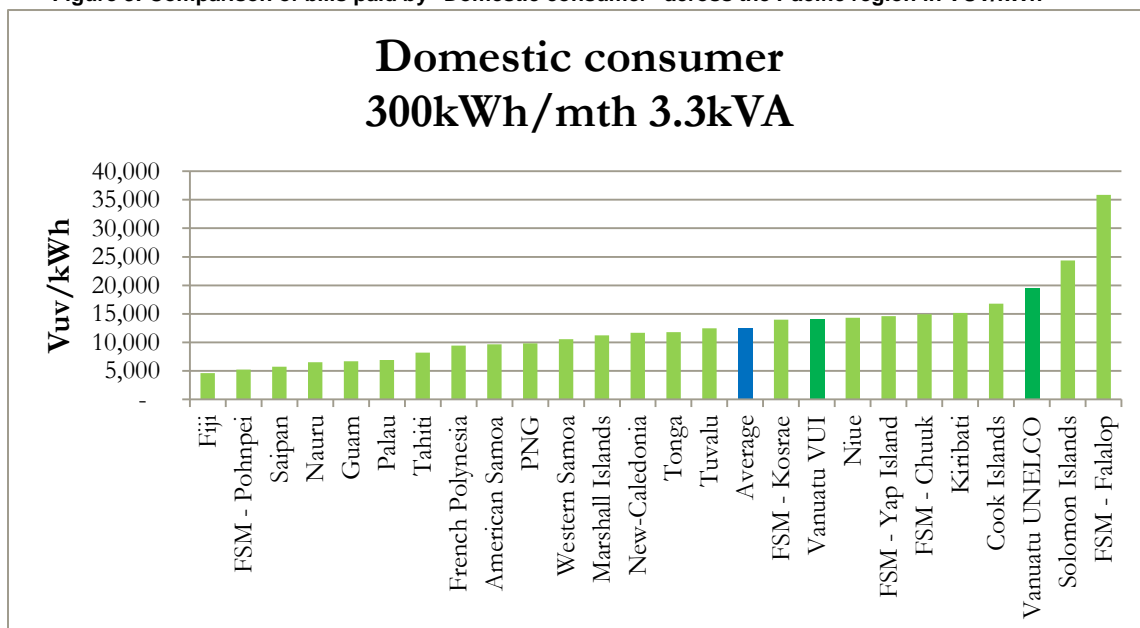
There are no fixed charges for this particular consumer category in Vanuatu, compared to 13% fixed charges and other fees on average across the Pacific.

Significantly lower than average bill of Pacific area in this consumption level in Vanuatu reflects the fact that tariff 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 for the sample of 25 electricity companies across the Pacific region.

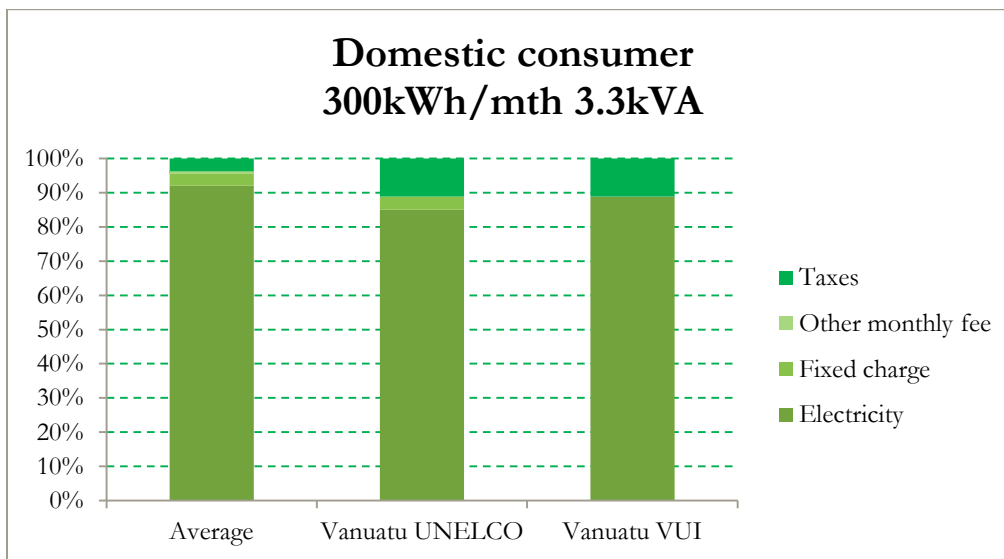
Figure 3: Comparison of bills paid by "Domestic consumer" across the Pacific region in VUV/kWh



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, 17th out of the 25 utilities in the sample. The VUI ranking movement from 20th to 17th position from 2016 to 2017 reflects the 7.10% reduction in the 2017 VUI's revised tariff. The typical monthly bill paid for these customers in Vanuatu is VUV 19,410 for UNELCO customers, and VUV 14,124 for VUI customers, based on January 2017 electricity prices. This compares to an average bill of VUV 12,562 for the Pacific area. UNELCO is 55% 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 form a higher proportion of Vanuatu’s domestic consumer’s electricity bills than generally for others. Vanuatu customers pay 12.5% VAT charged on all electricity bills, compared to a Pacific average of 4% tax.

In Vanuatu, there are fixed charges for UNELCO 'domestic customers' of 3.9% of the total bill, while there are no fixed charges for VUI customers. This is compared to an average fixed charge of 3.4% across the Pacific region.

3.3 Business consumer category

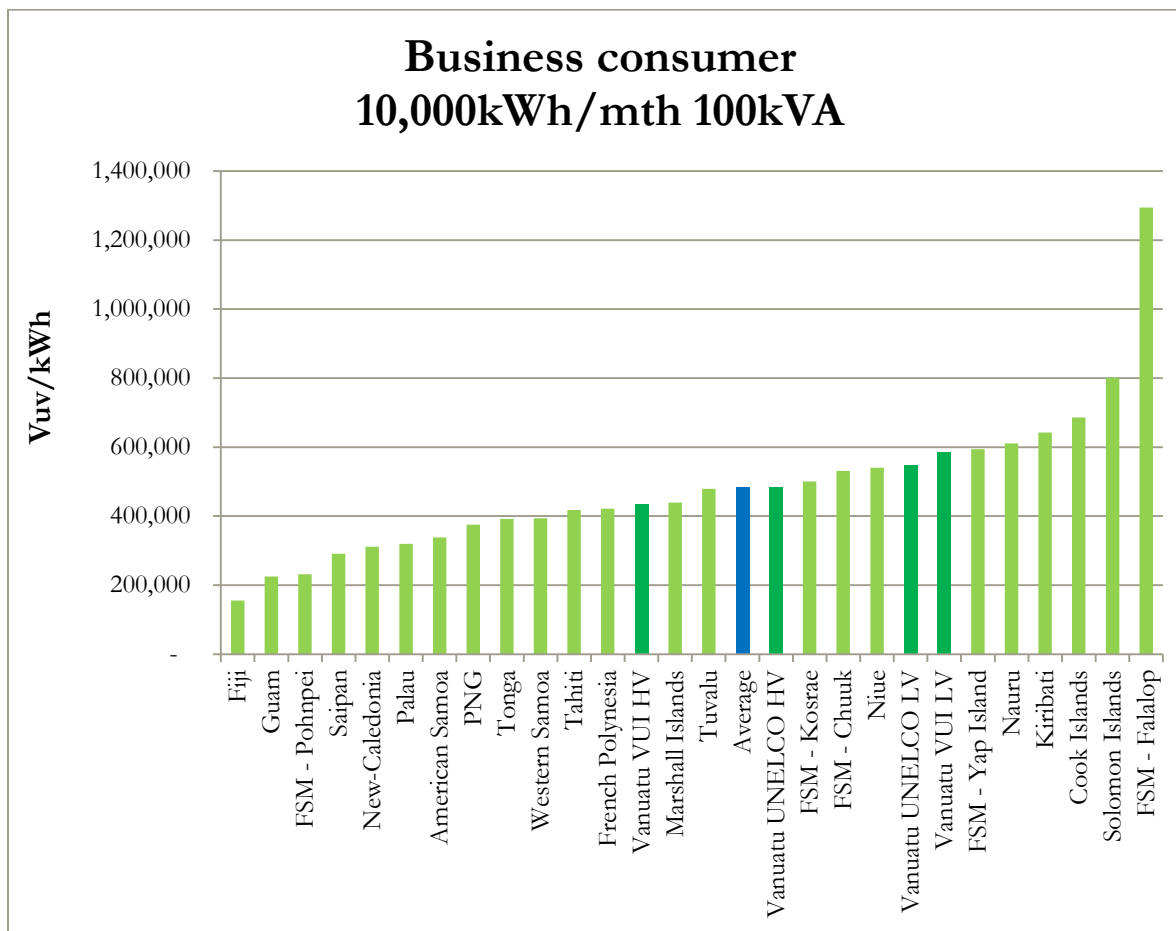
The following chart shows the total bill for a commercial customer with a monthly consumption of 10,000kWh on a 100kVA connection for the sample of 25 electricity companies across the Pacific region. Businesses with this level of consumption have an option to have a high voltage customer connection or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

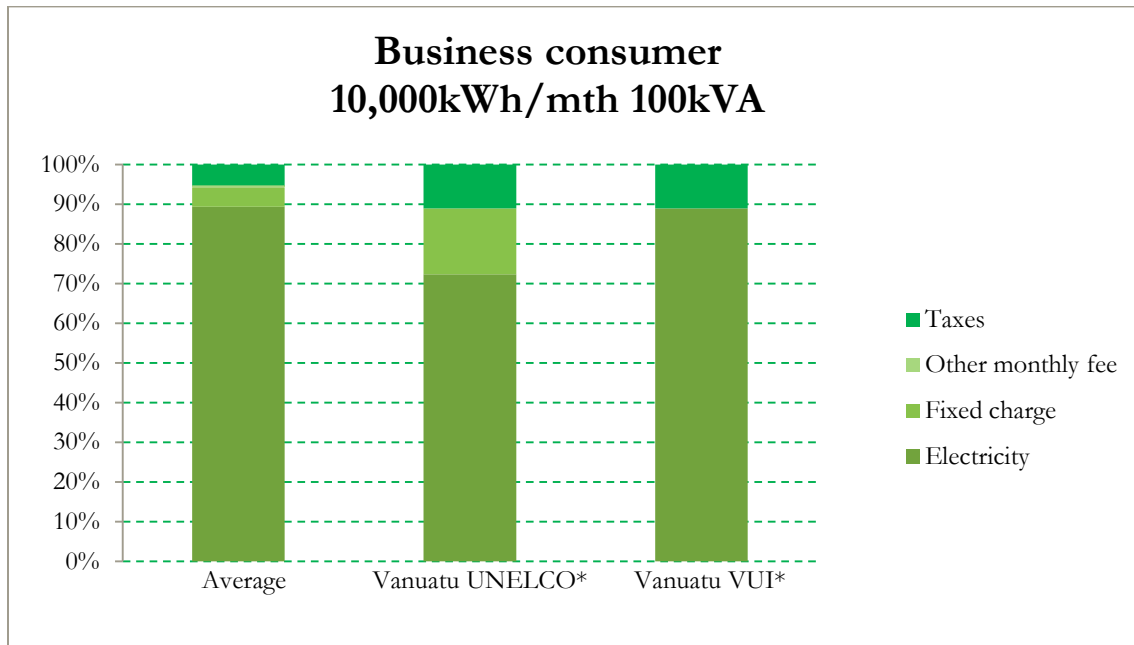
Figure 5: Comparison of bills paid by "Business consumers" across the Pacific region in Vt/kWh



Source: URA

The electricity costs for the “business consumers” category in Vanuatu are, for VUI, 10% below regional average for HV connection and 21% above regional average for LV connection. UNELCO’s “business consumers” subscribing to HV connections is closely in line with the regional average while LV connections are 13% above regional average. A typical monthly bill paid by HV customers in Vanuatu is VUV 434,514 for VUI customers and VUV 485,831 for UNELCO customers with the consumption level assumed. This is based on January 2017 prices with the assumption of a high voltage connection. UNELCO and VUI bills are compared to an average bill of VUV 482,633 for the Pacific area.

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



*Customers on Low Voltage (LV) Connections

Source: URA

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. This consists of 12.5% VAT charged on all electricity bills, compared to a Pacific average of 5% tax.

In Vanuatu, there are fixed charges for UNELCO customers with low voltage (LV) connection constituting 16.6% 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. However, for customers 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 22% fixed charge for high voltage VUI customers based on the assumed subscription.

3.4 Factors that impact electricity costs

3.4.1 The generation mix

The available technologies making up the generation 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. The greater the proportion of diesel contribution in the overall generation mix, the higher the electricity bills customers would expect to pay

The following table shows respective countries reliance on diesel based generation throughout 2016.

Table 3: Diesel contribution in energy generation mix in 2016

Country	Generation capacity in MW	Diesel contribution % ⁴
American Samoa	45	98%
Cook Islands	15	85%
Fiji	297	35%
Federated states of Micronesia (FSM)	12	95%
French Polynesia	186**	70%**
Guam	420	100%
Kiribati	8	90%
Marshall Islands	32.2	99%
Nauru	6.5	96.8%
New-Caledonia	517	69.5%
Niue	2.2	87%
Palau	29.4	97.8%
PNG	580	50%
Saipan	69.9	100%
Solomon Islands	27	95%
Tahiti	59	37%
Tonga	16.5	87%
Tuvalu	5	57%
Vanuatu UNELCO *	27	93.2%
Vanuatu VUI *	4	28.5%
Western Samoa	69.1	50%

**French Polynesian data is now reported separately from Tahiti as compared to previous comparison reports.

* 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.

3.4.2 Country characteristics

Besides the energy mix and diesel contribution, several country-specific characteristics affect final prices of energy. We are highlighting the following factors for the 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;

⁴ https://www.mfat.govt.nz/assets/_securedfiles/Peace-Rights-and-Security/Pacific-Energy-Country-Profiles-2016.pdf
Utilities Regulatory Authority – Pacific Region Electricity Bills Comparison Report, June 2017

- 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; 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 \$21.1M in 2015 (FJD 27.4M in 2014). 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.
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 billings to customers based on the Levelized Energy Adjustment Clause (LEAC). The drop in tariff reflect the global prices for the first six months in 2016 which are then adjusted based on the LEAC by the PUC 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

	<p>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-subsidization is more pronounced for UNELCO consumers.</p> <p>It should also be noted that Unelco tariffs are adjusted monthly to reflect current diesel prices. In January 2017, diesel cost/litre integrated in deriving tariff was lower compared to January 2016 prices resulting in lowering of tariffs for all end users.</p> <p>According to percentage figures* below, for UNELCO's domestic customers, the price paid by these customers apart from the VAT of 12.5% and fixed charge of 3.9% as identified above, the electricity bills further includes 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% of which are incorporated into the overall electricity bill.</p>
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*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, January 2017 electricity prices in the region had increased by an average of 2% since the time of the previous release of June 2016. 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, usage and reflected in customer bills. Countries largely relying on diesel for generation have seen significant rise in their tariffs ranging from 8% to 29%.

A significant rise of electricity bill by 29% was observed in Saipan. The increase is mainly due to a rise in the average fuel prices observed in the second half of 2016 in Dubai Fateh Price that reflects in its local tariff.

Small domestic consumers						
Country	Average bill 2017	Ranking 2017	Average bill 2016	Ranking 2016	Tariff Variation	Ranking shift
Fiji	541	1	521	1	4%	0
Vanuatu UNELCO	1,044	2	1,054	2	-1%	0
Vanuatu VUI	1,065	3	1,121	3	-5%	0
Nauru	1,309	4	1,209	4	8%	0
Palau	1,404	5	1,414	6	-1%	1
FSM - Pohnpei	1,410	6	1,420	7	-1%	1
Tuvalu	1,558	7	1,438	8	8%	1
Tahiti	1,574	8	1,744	10	-10%	2
French Polynesia	1,587	9	1,640	9	-3%	0
Saipan	1,753	10	1,363	5	29%	-5
Guam	2,638	11	2,777	19	-5%	8
PNG	2,101	12	2,243	12	-6%	0
Western Samoa	2,110	13	2,292	13	-8%	0
Kiribati	2,202	14	1,988	11	11%	-3
Marshall Islands	2,248	15	2,400	15	-6%	0
Tonga	2,353	16	2,343	14	0%	-2
Average	2,391		2,350		2%	
American Samoa	2,452	17	2,419	16	1%	-1
FSM - Kosrae	2,620	18	2,639	18	-1%	0
Cook Islands	2,833	19	2,580	17	10%	-2
FSM - Yap Island	2,876	20	2,897	21	-1%	1
New-Caledonia	2,983	21	3,074	22	-3%	1
FSM - Chuuk	2,985	22	2,780	20	7%	-2
Niue	3,487	23	3,174	23	10%	0
Solomon Islands	5,255	24	4,780	24	10%	0
FSM - Falalop	7,383	25	7,437	25	-1%	0

Source: URA

4.2 Domestic consumers price evolution

Despite the general rise in the international fuel prices, the “Domestic consumers” category has shown drop in average prices over the period by -2%. The significant decrease in prices is shown in Western Samoa with -28%, Tahiti with -27%, French Polynesia and Guam by -11% and -9% respectively. Overall, most customers in this category experienced drop in their bills thus pulling down the pacific average bill.

Bills variations are in line with the trends observed in the Small domestic consumer category.

Domestic consumers						
Country	Average bill 2017	Ranking 2017	Average bill 2016	Ranking 2016	Tariff variation	Ranking shift
Guam	6,696	1	7,342	6	-9%	5
Fiji	4,614	2	4,535	2	2%	0
FSM - Pohnpei	5,229	3	5,267	3	-1%	0
Saipan	5,731	4	3,760	1	52%	-3
Nauru	6,546	5	6,043	4	8%	-1
Palau	6,914	6	6,963	5	-1%	-1
Tahiti	8,202	7	11,238	10	-27%	3
French Polynesia	9,461	8	10,689	9	-11%	1
American Samoa	9,662	9	9,479	7	2%	-2
Western Samoa	9,662	10	13,384	16	-28%	6
PNG	9,818	11	10,480	8	-6%	-3
Marshall Islands	11,238	12	11,999	13	-6%	1
New-Caledonia	11,660	13	12,014	14	-3%	1
Tonga	11,767	14	11,716	12	0%	-2
Average	12,527		12,732		-2%	
Tuvalu	12,487	15	11,526	11	8%	-4
FSM - Kosrae	13,966	16	14,066	19	-1%	3
Vanuatu VUI	14,124	17	15,316	21	-8%	4
Niue	14,334	18	13,049	15	10%	-3
FSM - Yap Island	14,601	19	14,706	20	-1%	1
FSM - Chuuk	14,924	20	13,902	18	7%	-2
Kiribati	15,142	21	13,666	17	11%	-4
Cook Islands	16,782	22	17,570	22	-4%	0
Vanuatu UNELCO	19,410	23	19,604	23	-1%	0
Solomon Islands	24,371	24	23,902	24	2%	0
FSM - Falalop	35,834	25	36,092	25	-1%	0

Source: URA

4.3 Business consumers price shift

The average tariff charged to Business consumers across the region dropped by 1% over the period. In several instances the tariff structures have been adjusted along with fuel compensation variables to reflect the changes. Tahiti, French Polynesia, Western Samoa and Vanuatu VUI LV tariffs drop by 21%, 17%, 15% and 8% respectively, this showing a commitment to support the local economy as low electricity cost would lower production cost thus attracting more investors. On the other hand, Saipan increased by 29%, Kiribati by 11% while Cook Islands and Niue both increased by 10%. 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 given above. For countries that passed on their drop or rise in diesel prices, the average tariff ranges from -8% to 8% as shown

in the table below. The time lag by which these countries passed on these drop 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	Average bill 2017	Ranking 2017	Average bill 2016	Ranking 2016	Tariff variation	Ranking shift
Guam	206,020	1	222,941	2	-8%	1
Fiji	155,863	2	150,166	1	4%	-1
FSM - Pohnpei	231,344	3	233,013	4	-1%	1
Saipan	291,374	4	226,377	3	29%	-1
New-Caledonia	311,649	5	321,125	5	-3%	0
Palau	320,188	6	322,496	6	-1%	0
American Samoa	337,973	7	332,014	7	2%	0
PNG	375,157	8	400,475	9	-6%	1
Tonga	392,222	9	390,541	8	0%	-1
Western Samoa	393,993	10	466,169	12	-15%	2
Tahiti	418,362	11	527,225	19	-21%	8
French Polynesia	421,911	12	508,937	18	-17%	6
Vanuatu VUI HV	434,514	13	464,963	11	-7%	-2
Marshall Islands	439,573	14	469,308	13	-6%	-1
Average	482,633		488,544		-1%	
Tuvalu	479,652	15	442,745	10	8%	-5
Vanuatu UNELCO HV	485,831	16	490,725	14	-1%	-2
FSM - Kosrae	500,421	17	504,029	17	-1%	0
FSM - Chuuk	531,581	18	497,742	16	7%	-2
Niue	540,421	19	492,001	15	10%	-4
Vanuatu UNELCO LV	547,223	20	552,758	20	-1%	0
Vanuatu VUI LV	586,375	21	638,747	25	-8%	4
FSM - Yap Island	594,379	22	598,665	23	-1%	1
Nauru*	610,986	23	563,973	21	8%	-2
Kiribati	642,392	24	579,785	22	11%	-2
Cook Islands	686,528	25	625,018	24	10%	-1
Solomon Islands	801,017	26	865,272	26	-7%	0
FSM - Falalop	1,294,143	27	1,303,475	27	-1%	0

*Nauru's 2015 estimated bill should be the same as in 2016. Error in Nauru's business consumer 2015 estimated bill calculation.

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 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.

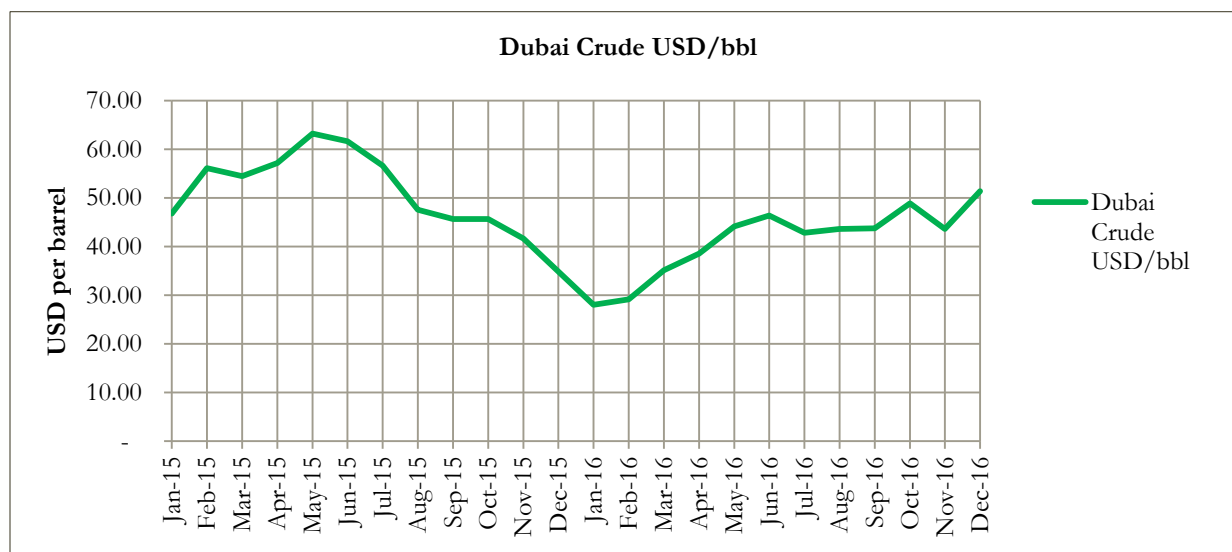
In order to avoid distortions in the comparison of shifts in rankings over time, the exchange rates are kept constant using spot exchange rates to recalculate the corresponding bills for last report. However, fluctuations are only partly neutralized as the costs related to imported fuels and materials 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. It should be noted that URA further reduced VUI's base price in January 2017, significantly impacting the electricity price of VUI's business customers connecting with a low voltage connection. Furthermore, UNELCO electricity prices are adjusted monthly reflecting current invoiced fuel prices while VUI's prices are adjusted annually.

This fifth 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 2016 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 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 venture into renewable energy sources competing against fossil fuel generation. The resulting effect in Vanuatu shows Utilities commitment into increasing renewable energy penetration into overall generation mix such as Solar and Wind. There is a concern expressed by the utilities that increase in Solar and Wind (intermittent renewable) may give rise to grid instability which in turn may require investments to restore the grid stability and impacts tariffs.

The URA team wishes to thank all the persons involved with the regulatory agencies and utility companies across the region who graciously helped us compile 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
Small domestic consumer												
Average use per month	60	kWh										
Amperage	1.1	kVa										
Electricity in VUV	541	981	1,802	2,064	1,393	1,868	1,958	1,542	2,324	1,224	2,248	4,527
Fixed charge in VUV	-	325	650	-	517	395	-	-	1,162	-	-	728
Other monthly fee in VUV	-	-	-	-	-	578	-	-	-	-	-	-
Taxes in VUV	-	98	-	46	191	142	245	16	-	86	-	-
Estimated bill in VUV	541	1,404	2,452	2,110	2,101	2,983	2,202	1,558	3,487	1,309	2,248	5,255
Domestic consumer												
Average use per month	300	kWh										
Amperage	3.3	kVa										
Electricity in VUV	4,414	6,106	9,012	9,632	8,408	9,342	13,460	11,951	13,172	6,118	11,238	22,914
Fixed charge in VUV	-	325	650	-	517	1,184	-	-	1,162	-	-	1,456
Other monthly fee in VUV	-	-	-	-	-	578	-	-	-	-	-	-
Taxes in VUV	201	482	-	917	893	555	1,682	536	-	428	-	-
Estimated bill in VUV	4,614	6,914	9,662	10,549	9,818	11,660	15,142	12,487	14,334	6,546	11,238	24,371
Business consumer												
Average use per month	*****	kWh										
Amperage	100	kVa										
Electricity in VUV	141,968	296,658	291,959	342,603	340,431	212,598	571,015	456,812	539,258	571,015	439,573	779,169
Fixed charge in VUV	1,207	1,191	46,014	-	621	83,535	-	-	1,162	-	-	21,846
Other monthly fee in VUV	-	-	-	-	-	675	-	-	-	-	-	-
Taxes in VUV	12,689	22,339	-	51,390	34,105	14,840	71,377	22,841	-	39,971	-	1
Estimated bill in VUV	155,863	320,188	337,973	393,993	375,157	311,649	642,392	479,652	540,421	610,986	439,573	801,017

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	2,353	2,464	2,843	2,620	909	2,469	7,113	995	1,014	988	1,101	928	947
Fixed charge in VUV	-	-	-	-	433	271	271	758	1,624	279	279	-	-
Other monthly fee in VUV	-	-	-	-	-	-	-	-	-	232	130	-	-
Taxes in VUV	-	370	142	-	67	137	-	-	-	75	76	116	118
Estimated bill in VUV	2,353	2,833	2,985	2,620	1,410	2,876	7,383	1,753	2,638	1,574	1,587	1,044	1,065
Domestic consumer													
Average use per month	300	kWh											
Amperage	3.3	kVa											
Electricity in VUV	11,767	16,782	14,214	13,966	4,547	13,635	35,563	4,973	5,072	6,534	7,099	16,503	12,554
Fixed charge in VUV	-	-	-	-	433	271	271	758	1,624	118	1,259	750	-
Other monthly fee in VUV	-	-	-	-	-	-	-	-	-	1,159	652	-	-
Taxes in VUV	-	-	711	-	249	695	-	-	-	391	451	2,157	1,569
Estimated bill in VUV	11,767	16,782	14,924	13,966	5,229	14,601	35,834	5,731	6,696	8,202	9,461	19,410	14,124
Business consumer													
Average use per month	10,000	kWh											
Amperage	100	kVa											
Electricity in VUV	392,222	596,593	506,267	500,421	129,923	565,534	1,293,602	290,292	188,055	326,479	345,314	318,200	290,000
Fixed charge in VUV	-	387	-	-	87,698	541	541	1,083	17,965	33,324	34,773	113,650	96,235
Other monthly fee in VUV	-	-	-	-	2,707	-	-	-	-	38,637	21,733	-	-
Taxes in VUV	-	89,547	25,313	-	11,016	28,304	-	-	-	19,922	20,091	53,981	48,279
Estimated bill in VUV	392,222	686,528	531,581	500,421	231,344	594,379	1,294,143	291,374	206,020	418,362	421,911	485,831	434,514

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.