

**Utilities
Regulatory
Authority**

Electricity Fact Sheet

2015 – 2020

December 2021

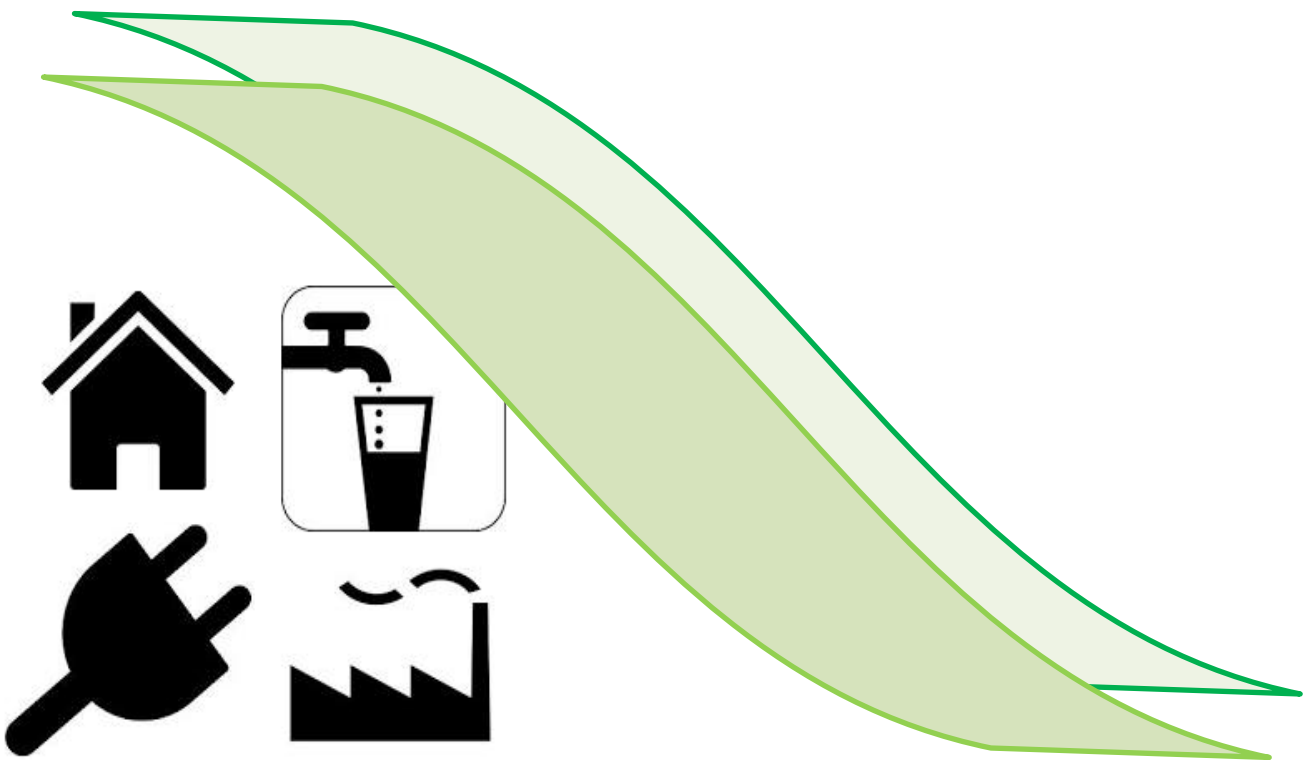


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1 Introduction

The Utilities Regulatory Authority (the ‘Authority’) was established under the URA Act no. 11 of 2007 (as amended) as the economic regulator for electricity and water services in Vanuatu. The Authority is pleased to present this updated ‘Electricity Fact Sheet’ (EFS) providing electricity statistical information/data via charts and graphs in Vanuatu, particularly for the concession areas of Port Vila where UNELCO¹ is the operator, Lakatoro (Malekula) and Tanna (Lenakel) where the Department of Energy² (DoE) is operating since July 2020 when UNELCO’s concession contracts expired. Ambae, Vanua Lava (Sola & Mosina), Port Olry, Maewo (Talise) and Luganville where VUI³ is operating after signing a Concession Deed with the Government in June 2019. Also included is the service area of Wintua-Lorlow (South-West Bay Malekula) where an established electrical cooperative is manning the operation. The EFS is provided as part of the Authority’s functions under Section 12(1)(c) of the Authority’s Act. The EFS is updated on an annual basis with the recent year’s data (2020) added to show electricity statistics and the trend thereof for the past six years. It further provides readers the developments within the electricity concession areas in Vanuatu.

Data presented in this report is consolidated for all abovementioned areas. For specific data presented in this EFS corresponding to a particular concession or service area, the reader may refer to the appendices presented at the end of the EFS. This EFS is an update and replaces the previously issued EFS of September 2020.

1.1 Prospective Electrification Projects

The electrification projects listed here below may materialise within the medium term or may have eventuate already but are not included in this report due to data unavailability. These projects will have a bearing in the energy mix and electricity market in Vanuatu prospectively.

- The Sarakata Hydroelectric power project with a proposed installed capacity of 1 MW under JICA. Construction and civil works anticipated to begin around 2023.
- The Brenwei Hydro project with installed capacity of 400 kW is scheduled for completion in 2022 and to supply electricity to the Lakatoro electricity grid including electrifying villages around and within proximity of the Brenwei Hydro.
- “Power Blox” electricity system currently installed and commissioned on Lelepa Island is a new renewable technology. The system in Lelepa is a pilot project aimed at assessing its potential before it can be replicated elsewhere in Vanuatu.

- Component II of the Vanuatu Rural Electrification Project Phase II to be funded by the World Bank targeting 5 sites on Malekula Island. These potential sites are to be fitted with mini grid systems with hybrid generation sources to be primarily powered by Solar PVs coupled with storage facilities and backed up by a standby diesel plant.
- The Loltong pico-hydro project (north Pentecost) integrated with Solar PVs is currently in operation with a combined installed capacity of 8.8 kW. Its data however does not form part of this report.
- There are other smaller electrification projects currently in operations but due to unavailability of data, this report does not capture them. The Authority will endeavour to work with the DoE and development partners to have timely data to ensure the EFS capture as much as possible the electricity market in Vanuatu.

1.2 Limitations of the Electricity Factsheet Report

A setback in completing this report was due to the DoE not being able to provide the required data on time. However, the Authority also understands the challenges encountered by the DoE in manning the operations in Tanna and Malekula and as a result, this factsheet is only reporting data of Tanna and Malekula electricity concessions from January to July 2020 as provided by UNELCO (before the expiration of its concession contract) for only a few of electricity indicators highlighted in this report.

2 Executive Summary

Overall, the electricity developments in the Concession areas are affected by the following changes in 2020 from 2019:

- ❖ Available electricity generation sources in Vanuatu are comprised of diesel, copra oil, hydro, wind and solar in 2020.
- ❖ Overall generation installed capacity increased by 0.85 MW in 2020, a 2.6 % increment.
- ❖ Consolidated peak demand increased by 0.57% in 2020.
- ❖ Gross electricity generation increased by 0.66 GWh in 2020, a 2.6% decrease from preceding year.
- ❖ The total energy from renewable sources decreased by 3% in 2020.
- ❖ The overall diesel consumption decreased by 1,763,908 litres in 2020.
- ❖ The quantity of electricity users continues to consistently increase with approximately 115⁴ new additional customers in 2020 throughout all the concession areas.
- ❖ The number of planned outages in 2020 decreased by 17.8% while unplanned outages increased by 6.8% compared to 2019.

¹ Union Electrique du Vanuatu Limited (operating in Port Vila (1986), Malekula (2000) & Tanna (2000))

² Department of Energy took over the operation of Tanna and Malekula (Lakatoro) in July of 2020 after the concession contract between the Vanuatu Government and UNLECO expired in the same month.

³ Vanuatu Utilities and Infrastructure Limited (Main office in Santo, Luganville (2011))

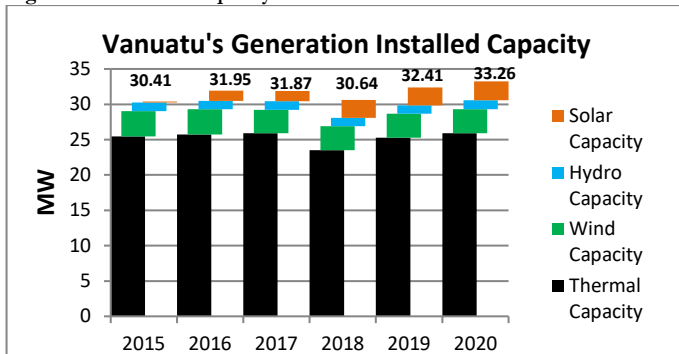
⁴ Net figure when we sum the number of new customers and customers leaving the network

The Authority believe the EFS will communicate to interested readers useful information about the electricity market in Vanuatu.

3 Generation installed capacity in Vanuatu

Total installed capacity of the available generation resources in Vanuatu as at end of 2020 stood at 33.26MW compared to 30.41MW at the end of 2015, -as shown in Figure 1 below. Appendix 13.1 provides more details of installed capacity per service area.

Figure 1: Generation capacity in Vanuatu

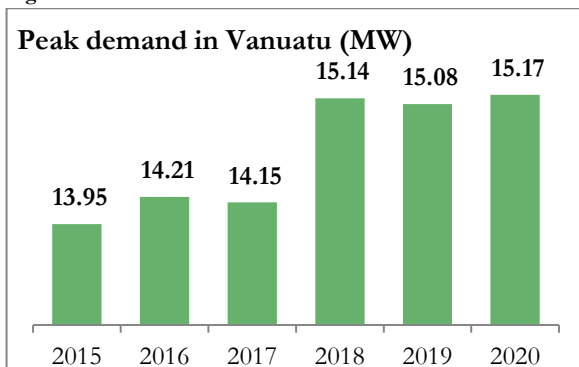


Source: UNELCO, VUI, DoE and Pcs Regulatory Reports

The overall generation capacity recorded a decrease from 2017 to 2018 by 1.23 MW and consecutively increased in 2018 to 2019 by 1.77 MW and 0.85 MW in 2020. The increase in total installed capacity is due to reporting of the newly operating 75-kW hydro grid in Talise (Maewo), the 75-kW solar mini grid in Wintua and Lorlow (South Malekula), the combined 180-kW diesel plants in Ambae for the 3 mini grids and the combined 120-kW diesel plants in Sola and Mosina (Vanua Lava).

4 Peak demand in Vanuatu

Figure 2: Peak demand in Vanuatu



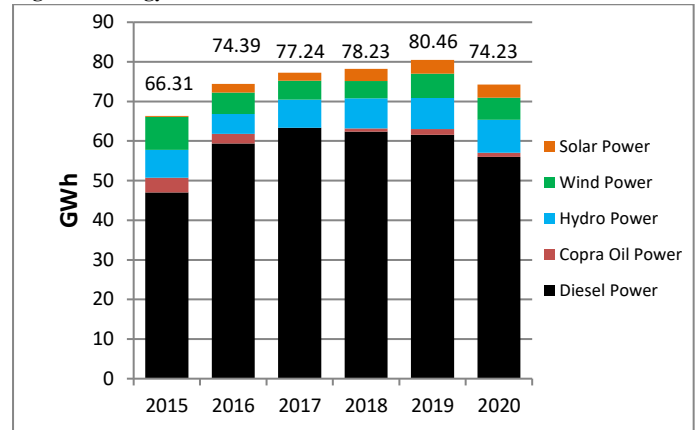
Source: UNELCO & VUI Regulatory Reports

Overall peak demand in Vanuatu has recorded the highest increase ever in 2020 (15.17 MW), an increase of 0.57% from 2019. Peak demand in the service areas of Luganville, Port Olry, Tanna and Malekula continues to grow consistently since 2017. The Tanna and Malekula peak-demand are based on data provided by UNELCO from operations between January and July 2020 only,

due to unavailability of data from DoE for the remaining months of the year. Refer to Appendix 13.2 for peak demand per service area for the reporting years.

5 Energy mix in Vanuatu

Figure 3: Energy Mix in Vanuatu



Source: UNELCO & VUI Regulatory Reports

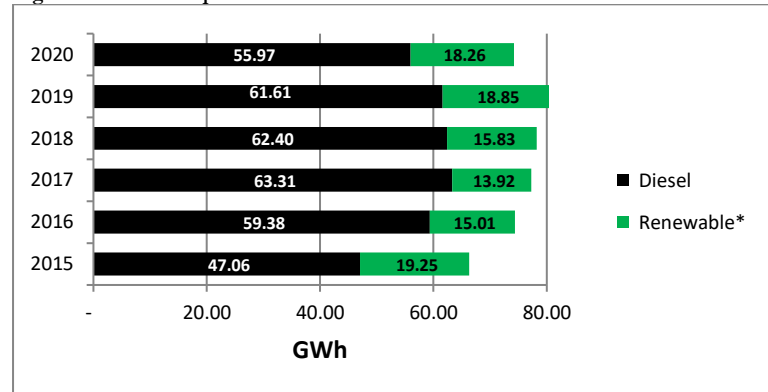
Figure 3 illustrates the consolidated energy mix in Vanuatu for all electricity service areas. Energy from thermal source continued to dominate the share of the energy mix in 2020 like past years. Diesel generation contributed 75.4 %, followed by hydro contributions of 11.2 %, while wind contributed 7.6%, Solar 4.4% and Copra Oil 1.5% in 2020. Solar energy contributions include Government Solar Farms at both Meteo Complex and Parliament House Complex, in Luganville and Wintua – Lorlow. Hydro contributions include the Sarakata and Talise hydro on Maewo.

Comparing the evolution from 2019 to 2020, Hydro production increased by 7% due to the additional Talise hydro plant in Maewo; whilst copra oil production decreased by 25% despite an increase in copra oil litres used by 9% as depicted in Figure 6 below; wind and solar production also decreased by 9% and 6% respectively.

Refer to Appendix 13.3 and Appendix 13.4 detailing the energy mix per electricity service area.

6 Renewable penetration in Vanuatu

Figure 4: Renewable penetration in Vanuatu



* Renewable energy comprises of energy from Copra oil, Solar, Wind & Hydro
Source: UNELCO & VUI Annual Technical Reports, PCS & DoE monthly reports

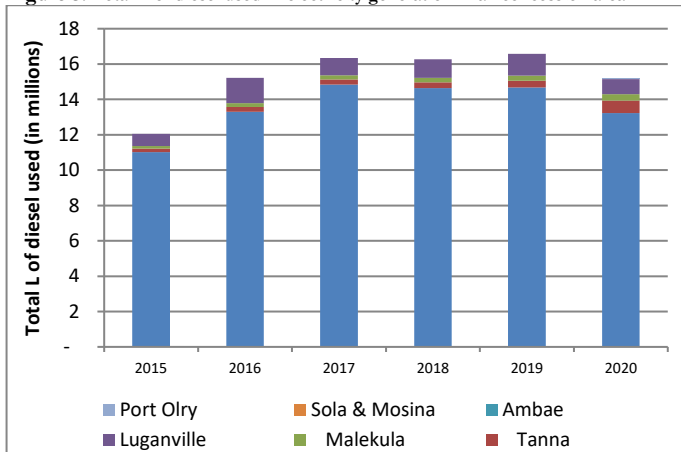
Renewable penetration decreased by 3.09 % in 2020 from 2019. The slight decrease was due to the reduction in copra oil production in 2020 including decrease production from wind and solar. Despite that, there is a general increase in the capacity of renewable sources as new solar PV powered mini grids in the country are being commissioned.

7 Litres (L) of diesel and copra oil used in electricity production

Figure 5 below shows the total Litres (l) of diesel used in the service areas captured in this report for electricity production. The overall total quantity of litres of diesel consumed for electricity generation in the electricity service areas decreased by 10.9% in 2020 from 2019.

By electricity service area, litres of diesel consumed by UNELCO in Port Vila and VUI (all concession areas operated) concessions decreased by 9.8% and 30.3% respectively, while the other concession areas reported an increase; Malekula by 19.3% and Tanna by 81.3%. The increase in diesel consumption was primarily due to increase in electricity demand.

Figure 5: Total L of diesel used in electricity generation in all concession area

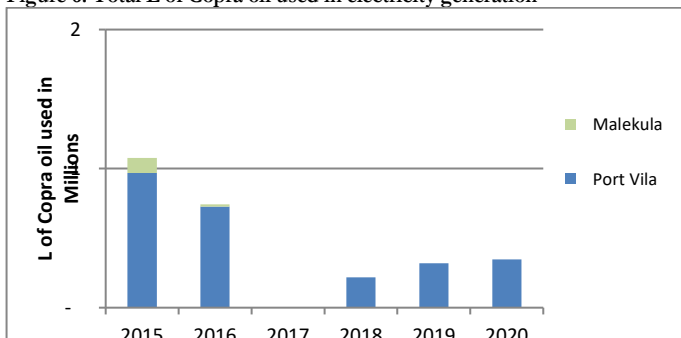


Source: UNELCO & DoE monthly tariff submission and Luganville concession reports

Appendix 13.5 provides in detail litres of diesel consumed by each service areas (including the newly added mini grids).

Figure 6 conveys the total litres of copra oil used annually in the corresponding years. Copra oil is still limitedly used for electricity production in the concessions of Port Vila (2015-2020) and Malekula (2015-2016) only.

Figure 6: Total L of Copra oil used in electricity generation

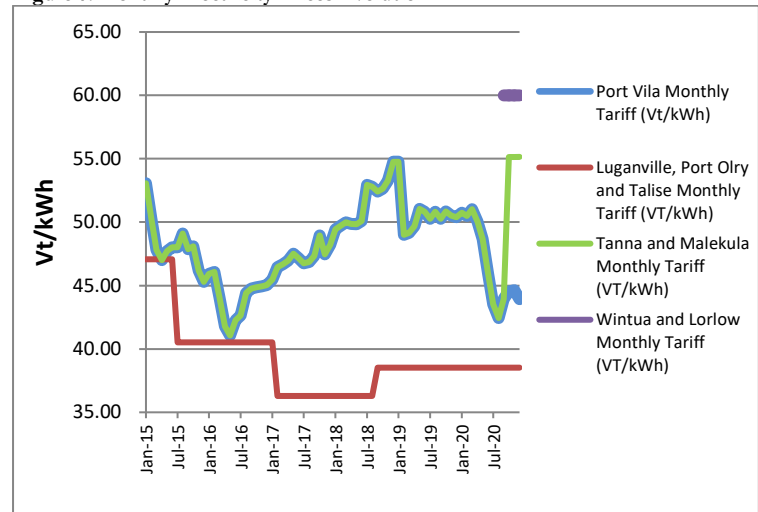


Source: UNELCO and DoE monthly tariff submission

It should be noted that, copra oil is not as efficient as diesel; that is one litre of copra oil utilized in generation cannot produce similar outcome as one litre of diesel. There are however cases whereby the diesel cost per litre exceeds the copra oil cost per litre significantly resulting in copra oil becoming more cost-effective to use. In 2017, no litres of copra oil were consumed in Port Vila nor Malekula. In 2020, despite the increase in litres of copra oil used for generation there was a decrease in copra oil production, which emphasizes the efficiency (compared the diesel) point stated. Appendix 13.6 presents the litres of copra oil used per service area for the reporting years.

8 Electricity Prices

Figure 7: Monthly Electricity Prices Evolution



Source: UNELCO & DoE monthly tariff submission and Luganville concession reports

Figure 7 depicts electricity prices uniformly charged in Port Vila, Tanna with Malekula from 2015 until July 2020. Thereafter, when DoE assumed operations in Tanna and Malekula, monthly prices commencing October to December 2020 differs from the UNELCO uniform monthly prices (as shown on the graph). The electricity tariff charged in the service areas operated by VUI (Luganville, Port Olry and Talise) and the Wintua – Lorlow grid is revised on an annual basis.

The mini grids of Vanua Lava and Ambae were not included in the graph because their electricity services are charged based on a monthly service fee rather than their consumption. The monthly service fee is as follow pertaining to the customer type: 2,500 VT/ month for small domestic customers, 5,000 VT/ month for public institutions and 12,000 VT/ month for businesses.

For UNELCO, the quantity of diesel utilized monthly plus the purchasing – volatile on monthly basis – for electricity generation is used to compute the monthly electricity prices due to ongoing heavy reliance on diesel generation to meet the baseload in Port Vila.

9 Electricity users and use in Vanuatu

Table 1 provides the categorization of electricity users to utilized to convey the number of electricity users and their respective consumptions in this report.

Table 1: User Classifications Details

User Classification	Details
Industrial	Private High Voltage Users, Government High Voltage Users, Port Vila Water Usage
Commercial	Business Users
Non-Commercial	Small Domestic Customers, Prepaid Users, Other Low Voltage Users, Government Low Voltage
Others	Streetlights/Sports Field, Energy not invoice (utility's office usage, utility's employee, and installations)

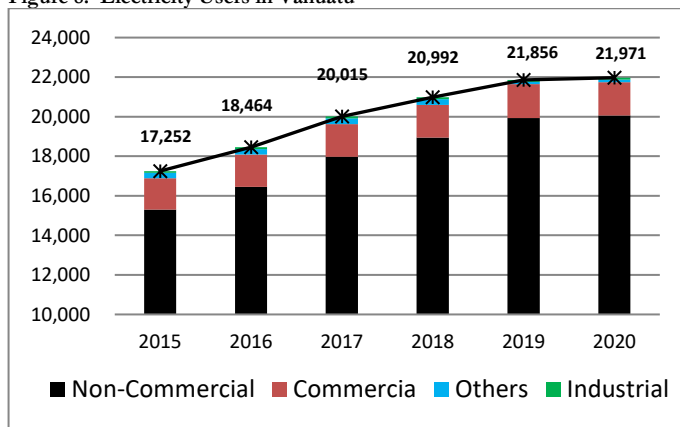
Subsections 9.1 and 9.2 presents data per the user classifications defined in Table 1 above. Note that number of utility employees is captured as well.

Appendixes 13.7 and 13.8 details the user count by classifications referred to in Table 1 reported by electricity service areas including the user energy consumption in kWh.

9.1 Electricity users in Vanuatu

Figure 8 presents the trend in user numbers throughout the reporting years with 2020 as the latest year added. The user numbers are reported as of 31st December of the respective years. It is necessary to mention that due to incomplete data from DoE, the Authority projected the Tanna and Malekula data from July to December 2020 to portray a fair estimate of customer users in 2020. The user numbers correspond to electricity meters installed to provide electricity access and service to users.

Figure 8: Electricity Users in Vanuatu



Source: UNELCO and VUI Annual Technical Reports

Electricity users in Vanuatu consistently grew from 2015 to 2019, particularly for the 'Non-Commercial' users which comprises largely on residential users. But in 2020, only the 'Industrial' users increased by 5.38% and 'Others' also increased by 4.07%. The number of 'Non-Commercial' users dropped by 0.6%,

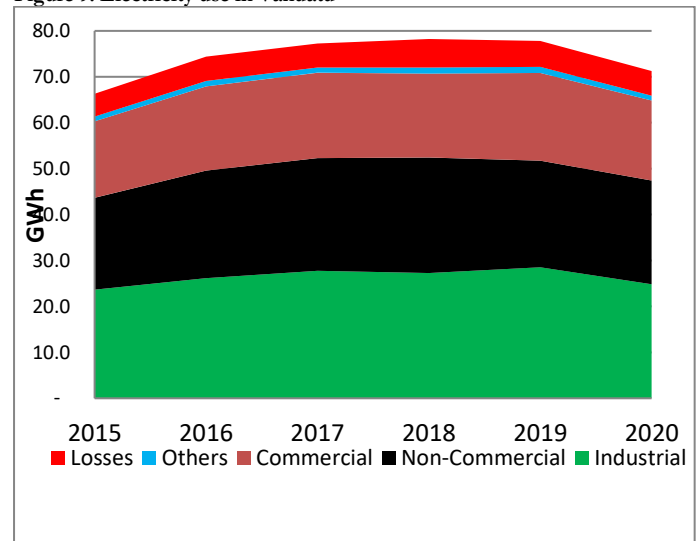
the 'Commercial' users also decreased in numbers by 0.94%. The drop may depict the Covid-19 impact on households when Vanuatu closes its international borders earlier in 2020.

It is important to note that, both UNELCO and VUI have in place a scheme (part of their investment plan) in reducing connection cost for residential customers. The upfront connection cost not covered by customers is embedded into the tariff (as utility Investments). This may be a primary contributing factor in the consistent increase in residential customers, aligned as well with Government's policies in promoting electricity access.

9.2 Electricity usage in Vanuatu

Figure 9 shows the growth in electricity usage by user classification as defined in Table 1. In 2020, all user group experienced a decline in their energy consumption. Again, this maybe largely pegged to the Covid-19 pandemic impact. Despite increase in new users, 'Commercial', 'Non-Commercial' and 'Others' energy consumption decreased by 8.5%, 13%, 2.7% and 22.7% respectively from 2019. For this section the Tanna and Malekula data from July to December 2020 were also projected.

Figure 9: Electricity use in Vanuatu



Source: UNELCO and VUI Annual Technical Reports

Losses depicted in figure 9 represents power losses in generation plant auxiliaries, transmission, and distribution losses and possibly from energy theft.

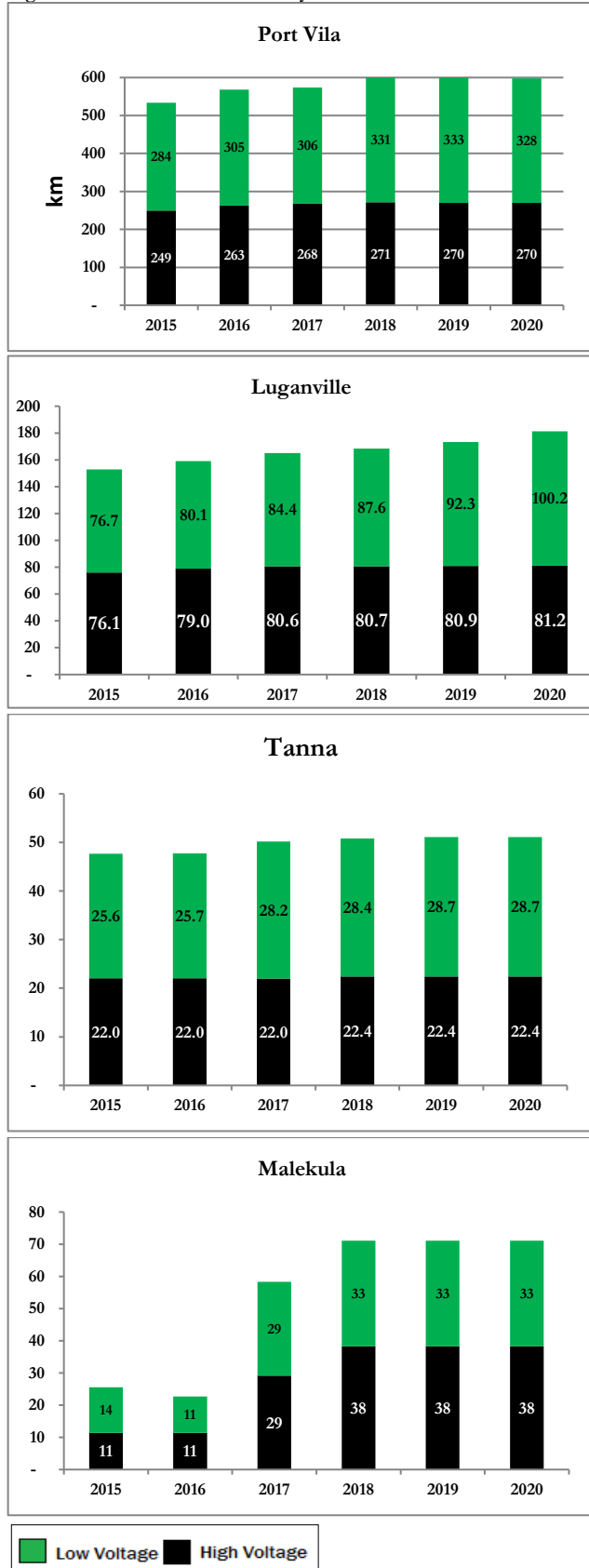
10 Electricity network length by concession area

Figure 10 represents the length of Low Voltage (LV) and High Voltage (HV) electricity lines in the four primary major electricity service areas. Other electricity service areas previously highlighted in this report were not included due to unavailability of data.

It should be noted that the sum of the lengths of the HV and LV lines does not convey the electricity network length on ground as there are some parts of the network whereby the LV and HV lines that run in parallel on the same poles. The network length

presented covers both the overhead and underground lines. However, it depicts the utilities commitment in extending electricity services to unelectrified areas within the area they are operating and serving on annual basis.

Figure 10: HV and LV line in km by Concession Area



Source: UNELCO and VUI Technical Reports

HV lines are the electricity network lines that connect and transmit electricity from the generating sources to the distribution transformers. LV lines run from the distribution transformers to the customers'/users' respective meters. (HV lines are set at 5.5KV, 20KV and 33kV while LV lines distribute electricity rated at 230 V single phase and 380 V, three phase).

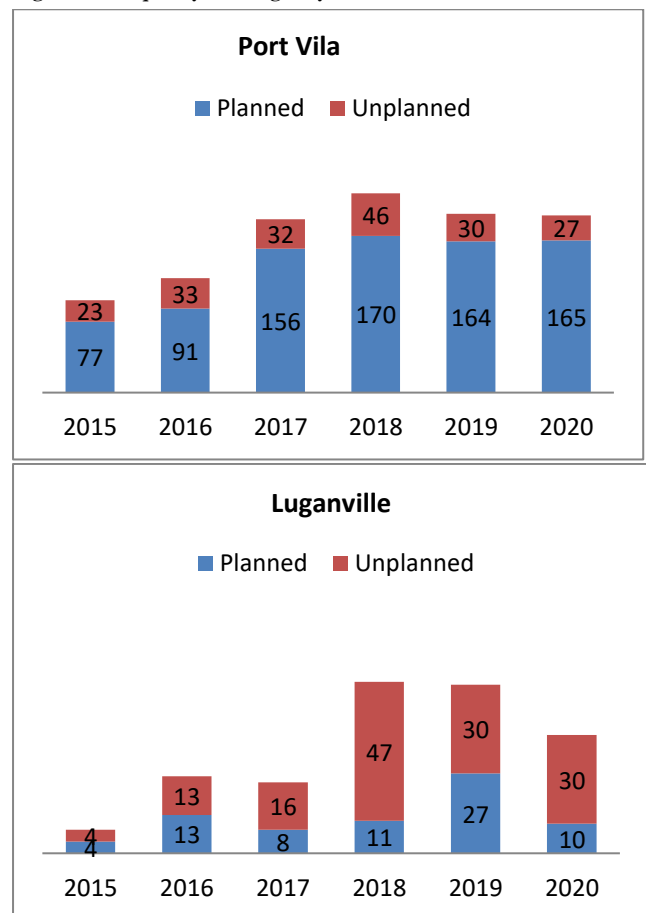
Major network changes by length in 2020 are briefly provided below:

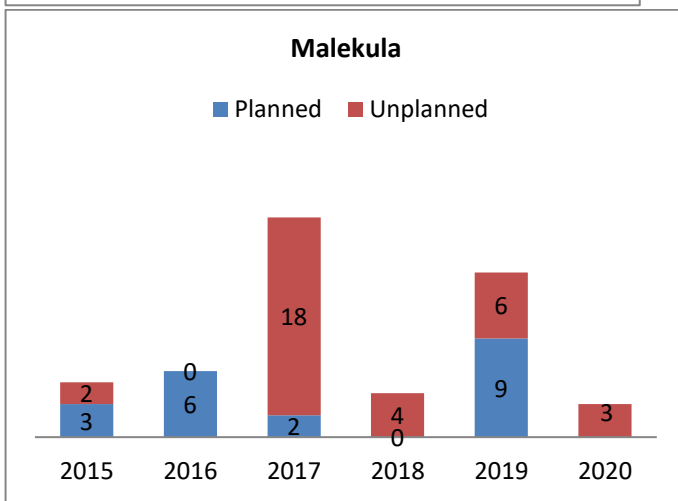
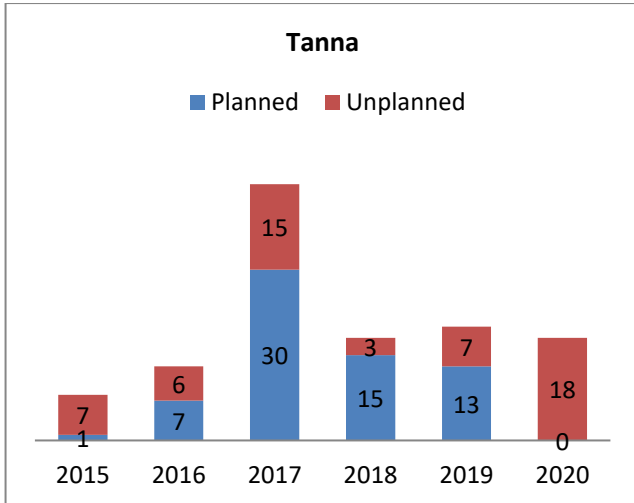
- ❖ In Luganville Santo, an increase of 8.5.% was observed in the LV lines and 0.4% in the HV lines.
- ❖ In Port Vila, however, there seemed to be no change in the network length in 2020.
- ❖ There were no developments undertaken on the electricity networks in Malekula and Tanna in 2020. After UNELCO's concession contract expired, the DoE basically maintain the operations ensuring continuity of service.

11 Reliability and outages of electric system by concession areas

11.1 Number of Outages (Planned and Unplanned) by concession areas

Figure 11: Frequency of outages by concession areas





Source: UNELCO and VUI Technical Reports

Figure 11 is showing the number/frequency of outages in the electricity service areas for the past 5 years. 'Planned outages' are planned by utilities, purposely to allow utility staffs to conduct maintenance works, network upgrades and connecting extensions to the electricity network. The date, time, and period in which the electricity service is unavailable to customers is usually communicated beforehand to customers via various communication means (e.g., radio, newspaper etc) for customers' awareness and preparation towards such time.

Unplanned outages are interruptions of electricity supply to customers that are caused by technical faults, vandalism, and force majeure acts to the electricity network. The graphs showed that in 2020 there was increase in the number of unplanned outages in Tanna network while in the other networks, the number of planned and unplanned outages was almost the same as the previous year.

11.2 Reliability of system by Service area

The following abbreviations are useful in interpreting Table 2 below regarding the average number of times (frequency) and duration of planned and unplanned outages a customer experiences annually throughout the 4 primary service areas.

Higher values indicate that a customer encounters more interruption in his/her electricity services.

N/A – Not Available

SAIFI – (System Average Interruption Frequency Index) is a measure of the number of times the average utility customer experiences an outage

SAIDI – (System Average Interruption Duration Index) is the average outage duration for each customer served reported in minutes.

Table 2: SAIFI and SAIDI by Concession Area

Years	Planned/ Unplanned/All	Port Vila		Lugaville		Tanna		Malekula	
		SAIFI	SAIDI	SAIFI	SAIDI	SAIFI	SAIDI	SAIFI	SAIDI
2014	Planned	0.3	35.8	1.4	325.1	3.1	422.9	0.7	45.0
	Unplanned	10.8	241.5	12.0	40.0	7.2	115.0	6.0	309.0
	All	11.1	277.3	13.4	365.1	10.2	537.9	6.7	354.0
2015	Planned	1.2	130.1	0.5	135.6	0.1	4.4	1.0	170.0
	Unplanned	6.0	94.0	6.8	241.4	4.0	49.9	2.0	45.0
	All	7.1	224.1	7.3	377.0	4.1	54.3	3.0	215.0
2016	Planned	1.9	232.2	0.8	219.1	1.0	66.8	0.5	118.0
	Unplanned	4.7	129.5	12.1	495.8	4.2	28.4	-	-
	All	6.6	361.7	12.8	714.9	5.2	95.2	0.5	118.0
2017	Planned	3.4	414.1	0.5	218.1	4.8	1,870.6	2.0	180.0
	Unplanned	4.8	391.8	13.3	466.4	10.3	275.8	16.0	316.0
	All	8.2	805.9	13.8	684.5	15.1	2,146.4	18.0	496.0
2018	Planned	1.1	296.3	1.5	731.6	1.2	90.7	-	-
	Unplanned	3.6	150.3	30.7	637.5	1.0	20.0	173.1	5.8
	All	4.7	446.6	32.2	1,369.1	2.2	110.7	173.1	5.8
2019	Planned	2.3	411.1	3.6	1,087.9	0.7	48.0	0.8	76.5
	Unplanned	3.0	214.0	22.2	471.1	3.3	58.3	5.9	190.5
	All	5.3	625.1	25.9	1,559.0	4.0	106.3	6.7	267.0
2020	Planned	0	0.17	1.907	733.36	0	0	0	0
	Unplanned	0	0.29	18.92	3834.87	0.13	0.2	0.1	0
	All	0	0.46	20.827	4568.23	0.13	0.2	0.1	0

Source: UNELCO and VUI Annual Technical Reports

11.3 Customer complaint by Service area

Table 3: Customer complaints received by the Utility

	2014	2015	2016	2017	2018	2019	2020
Port Vila	214	183	190	215	111	63	53
Tanna	0	5	5	5	0	1	0
Malekula	0	0	0	1	1	1	0
Luganville	0	0	1	0	1	2	0

Source: UNELCO and VUI Regulatory Reports

The data in table 3 above is annually updated by the utility and provided to the Authority. It represents customer complaints directly received by the utility.

Customer complaints are more pronounced in the Port Vila concession area reflecting its large customer base. The Authority issued a Commission Order⁵ in 2015 (with amendments) to strengthen its Customer Complaint and Dispute Resolution process and procedures which provide an out of court alternative complaint and dispute resolution.

Furthermore, in the beginning of 2018, the Authority inaugurated its Luganville North Branch Office as an avenue now available to customers in Luganville and northern part of Vanuatu to lodge their complaints in relation to regulated services challenges and complaints they may encounter.

⁵ <http://ura.gov.vu/index.php/services/commission-publications>

Table 4: Customer complaints received by the Authority

	2014	2015	2016	2017	2018	2019	2020
Port Vila	214	183	190	215	111	63	53
Tanna	0	5	5	5	0	1	0
Malekula	0	0	0	1	1	1	0
Luganville	0	0	1	0	1	2	0

Source: URA Customer Complaint database

Table 4 provides the number of customer complaints received by the Authority. While electricity customers approach the Authority for assistance, queries and complaints, the data provided in table 4 above is narrowed down to represent purely complaints that are related to electricity services.

While the Authority lacks representation on ground in Tanna and Malekula, customers can formally lodge their complaints when the Authority's technical team are inspecting the utility network and during consultation programs as organised by the Authority.

Further, the Authority and Transparency International Vanuatu has collaboratively established the 'Consumer Advocacy Group' (CAG). The CAG is a platform available to consumers (for both electricity and water) that can voiced customer complaints and concerns in a formal manner.

12 Closing Remarks

The Authority hopes that the information presented in this EFS is of value to interested readers in understanding the changes and developments affecting the electricity service and market in Vanuatu in the 4 primary service areas including smaller service areas as well.

The Authority welcomes any suggestions from readers to enhance the details and facts about the electricity service and market in this EFS to enhance future reporting of the EFS.

Thank you!



About the Utilities Regulatory Authority ('Authority')

The Authority is the independent economic regulator for water and electricity services in Vanuatu, established by the URA Act no. 11 of 2007 with amendments.

As part of its functions, the Commission is monitoring the provision of electricity and water utility companies and public services, promoting access, and protecting the long-term interest of customers, and communicating to customers' and the Government matters relating to the service providers.

Please do not hesitate to call us if you have any question on (678) 23335 or visit our office at the Office of the Utilities Regulatory Authority, VNPF Compound, Corner Pierre Lamy & Andre Ballande Street, or our North Branch office in Luganville.

Website: <http://www.ura.gov.vu>

13 Appendixes

13.1 Generation Capacity by Concession Area

Concession Area	Unit	2015	2016	2017	2018	2019	2020
Port Vila							
Thermal Capacity	kW	21.83	21.83	21.83	19.04	20.80	20.80
Wind Capacity	kW	3.58	3.58	3.30	3.40	3.40	3.40
Solar Capacity	kW	0.08	1.36	1.36	2.45	2.45	2.45
Total	kW	25.49	26.76	26.49	24.89	26.66	26.66
Malekula							
Thermal Capacity	kW	0.39	0.61	0.67	0.69	0.69	0.69
Wind Capacity	kW	-	-	-	-	-	-
Solar Capacity	kW	0.02	0.02	0.02	0.02	0.02	0.10
Total	kW	0.41	0.63	0.69	0.71	0.71	0.79
Tanna							
Thermal Capacity	kW	0.39	0.39	0.49*	0.69	0.69	0.69
Wind Capacity	kW	-	-	-	-	-	-
Solar Capacity	kW	0.03	0.03	0.03	0.03	0.03	0.03
Total	kW	0.43	0.43	0.53	0.72	0.72	0.72
Luganville							
Thermal Capacity	kW	2.85	2.89	2.93	3.08	3.08	3.08
Hydro Capacity	kW	1.20	1.20	1.20	1.20	1.20	1.20
Solar Capacity	kW	0.04	0.04	0.04	0.04	0.04	0.04
Total	kW	4.09	4.13	4.17	4.32	4.32	4.32
Port Olry							
Thermal Capacity	kW	-	-	-	-	-	0.33
Total	kW	-	-	-	-	-	0.33
Sola & Mosina							
Thermal Capacity	kW	-	-	-	-	-	0.12
Total	kW	-	-	-	-	-	0.12
Maewo							
Hydro Capacity	kW	-	-	-	-	-	0.08
Total	kW	-	-	-	-	-	0.08
Wintua & Lorlow							
Solar Capacity	kW	-	-	-	-	-	0.08
Total	kW	-	-	-	-	-	0.08
Ambae							
Thermal Capacity	kW	-	-	-	-	-	0.18
Total	kW	-	-	-	-	-	0.18

Port Olry Installed Capacity is added with Luganville data commencing 2016

* Updated accordingly per UNELCO and VUI technical reports

13.2 Peak Demand by Concession Area

Concession Area	Unit	2015	2016	2017	2018	2019	2020
Port Vila	MW	11.73	11.85	11.85	12.60	12.40	12.40
VUI (Luganville, Port Olry, Talise, Ambae, Vanua Iava)	MW	1.85	1.93	1.84	2.06	2.21	2.24
Malekula	MW	0.19	0.22	0.25	0.26	0.25	0.26
Tanna	MW	0.18	0.20	0.21	0.22	0.22	0.27
Peak Demand in Vanuatu		13.95	14.21	14.15	15.14	15.08	15.17

* Lakatoro cooperative did not provide any data on the Wintua and Lorlow mini grids' peak demand.

13.3 Energy Mix in Vanuatu

	Unit	2015	2016	2017	2018	2019	2020
Diesel Power	GWh	47.06	59.38	63.31	62.40	61.61	55.97
Copra Oil Power	GWh	3.68	2.40	-	0.79	1.44	1.09
Hydro Power	GWh	7.07	5.05	7.13	7.61	7.78	8.30
Wind Power	GWh	8.27	5.42	4.77	4.37	6.16	5.62
Solar Power	GWh	0.24	2.13	2.02	3.05	3.46	3.27
Total	GWh	66.31	74.39	77.24	78.23	80.46	74.23

13.4 Generation Mix by Concession Area

UNELCO - Port Vila	Unit	2014	2015	2016	2017	2018	2019	2020
Diesel Power	GWh	49.73	43.61	52.83	58.23	58.23	55.09	50.96
Copra Oil Power	GWh	3.04	3.42	2.37	-	-	1.44	1.09
Wind Power	GWh	6.79	8.27	5.42	4.77	4.77	6.16	5.62
Solar Power	GWh	0.11	0.11	0.87	0.85	0.85	2.41	2.31
IPP Solar Power	GWh	-	-	1.13	1.06	1.06	0.93	0.86
Total	GWh	59.67	55.41	62.61	64.91	64.91	66.04	60.82
UNELCO- Malekula	Unit	2014	2015	2016	2017	2018	2019	2020
Diesel Power	GWh	0.52	0.43	0.67	0.79	0.79	1.02	1.12
Copra Oil Power	GWh	0.18	0.26	0.04	-	-	-	-
Solar Power	GWh	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Total	GWh	0.73	0.72	0.74	0.82	0.82	1.05	1.15
UNELCO-Tanna	Unit	2014	2015	2016	2017	2018	2019	2020
Diesel Power	GWh	0.76	0.66	0.87	0.99	0.99	1.35	1.35
Solar Power	GWh	0.03	0.04	0.04	0.04	0.04	0.04	0.04
Total	GWh	0.79	0.70	0.91	1.03	1.03	1.39	1.39
VUI	Unit	2014	2015	2016	2017	2018	2019	2020
Diesel Power	GWh	1.57	2.37	5.01	3.30	3.30	4.15	2.54
Hydro Power	GWh	7.38	7.07	5.05	7.13	7.13	7.78	8.30
Solar Power	GWh	0.04	0.06	0.06	0.05	0.05	0.05	0.04
Total	GWh	8.99	9.49	10.12	10.48	10.48	11.98	10.87

*VUI 2020 data is inclusive of Luganville, Port Olry, Talise (Maewo), Ambae and Vanna Lava.

13.5 Total Litres of Diesel Utilized in Generation by Concession Area

Diesel Oil used in gen.	Unit	2015	2016	2017	2018	2019	2020
Port Vila	L	11,010,356	13,298,663	14,841,676	14,632,400	14,667,513	13,235,328
Tanna	L	200,600	264,450	290,740	327,725	382,997	694,335
Malekula	L	159,800	234,905	232,591	256,420	299,921	357,840
UNELCO	L	11,370,756	13,798,018	15,365,007	15,216,545	15,350,431	14,287,503
Luganville	L						771,132
Ambae	L						18,249
Sola & Mosina	L						13,865
Port Olry	L						56,764
VUI	L	688,857	1,426,685	976,259	1,047,748	1,234,456	860,010
Total Liters	L	12,059,613	15,224,703	16,341,266	16,264,293	16,181,395	14,417,487

13.6 Total Litres of Copra Oil Utilized in Generation by Concession Area

Copra Oil used in gen.	Unit	2015	2016	2017	2018	2019	2020
Port Vila	L	968,036	726,111	-	217,968	319,873	347,222
Malekula	L	109,847	16,992	-	-	-	-
TOTAL	L	1,077,883	743,103	-	217,968	319,873	347,222

13.7 Customer number by User Classification by Concession Area

Table 1 (page 5) of the EFS should be referred to be better informed about the data reported in the table below. It provides the number customer groups combined under the major electricity users.

Port Vila	2011	2012	2013	Unit	2014	2015	2016	2017	2018	2019	2020
Non-Commercial	8,569	9,102	9,836	No.	10,619	11,250	12,030	12,736	13,264	13,908	14,290
Commercial	1,080	1,097	1,102	No.	1,192	1,167	1,211	1,215	1,211	1,241	1,240
Industrial	62	69	71	No.	73	72	76	77	77	71	75
Others	75	179	181	No.	180	176	173	187	177	72	75
Total	9,786	10,447	11,190	No.	12,064	12,665	13,490	14,215	14,729	15,292	15,680
Malekula				Unit	2014	2015	2016	2017	2018	2019	2020
Non-Commercial	517	494	525	No.	539	557	585	940	1,063	1,168	1,028
Commercial	27	26	27	No.	26	23	24	25	26	29	24
Industrial	-	-	-	No.	-	-	-	-	-	-	-
Others	6	10	10	No.	9	16	16	14	8	1	1
Total	550	530	562	No.	574	596	625	979	1,097	1,198	1,053
Tanna				Unit	2014	2015	2016	2017	2018	2019	2020
Non-Commercial	641	655	847	No.	934	1,161	1,235	1,352	1,416	1,476	1,242
Commercial	16	22	23	No.	23	21	21	24	23	25	19
Industrial	-	-	-	No.	-	-	-	-	-	-	-
Others	5	9	9	No.	9	9	9	9	9	5	5
Total	662	686	879	No.	966	1,191	1,265	1,385	1,448	1,506	1,266
VUI				Unit	2014	2015	2016	2017	2018	2019	2020
Non-Commercial	1,942	1,991	2,028	No.	2,061	2,340	2,604	2,946	3,198	3,382	3,495
Commercial	322	316	324	No.	337	364	372	382	400	411	407
Industrial	14	15	15	No.	16	18	20	19	21	22	23
Others	24	70	67	No.	75	78	88	89	99	45	47
Total	2,302	2,392	2,434	No.	2,489	2,800	3,084	3,436	3,718	3,860	3,972

* VUI 2020 data is inclusive of Luganville, Port Olry, Talise (Maewo), Ambae and Vanna Lava.

13.8 Customer Energy Consumption by Major User Classification by Concession Area

Table 1 (page 5) of the EFS should be referred to be better informed about the data reported in the table below. It provides customer consumption but combined under the major electricity users.

Port Vila	Unit	2014	2015	2016	2017	2018	2019	2020
Non- commercial	GWh	17.33	16.95	19.79	20.54	21.01	18.48	17.75
Commercial	GWh	13.33	12.87	14.38	14.61	14.20	14.85	13.55
Industrial **	GWh	23.83	21.20	23.38	25.18	24.58	25.14	21.33
Other *	GWh	0.78	0.76	0.77	0.80	0.75	0.77	0.71
Total	GWh	55.27	51.78	58.32	61.13	60.54	59.25	53.34
Losses	GWh	4.40	3.63	4.29	3.78	4.36	4.19	4.32
Malekula								
Malekula	Unit	2014	2015	2016	2017	2018	2019	2020
Non- commercial	GWh	0.35	0.38	0.43	0.42	0.44	0.46	0.45
Commercial	GWh	0.21	0.19	0.19	0.22	0.24	0.24	0.29
Industrial	GWh	-	-	-	-	-	-	-
Other *	GWh	0.01	0.02	0.02	0.02	0.02	0.02	0.02
Total	GWh	0.57	0.59	0.64	0.66	0.70	0.71	0.75
Losses	GWh	0.08	-	-	0.12	0.23	0.25	0.07
Tanna								
Tanna	Unit	2014	2015	2016	2017	2018	2019	2020
Non- commercial	GWh	0.43	0.39	0.53	0.59	0.67	0.80	0.95
Commercial	GWh	0.25	0.21	0.25	0.28	0.32	0.36	0.37
Industrial	GWh	-	-	-	-	-	-	-
Other *	GWh	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Total	GWh	0.70	0.61	0.80	0.90	1.01	1.18	1.34
Losses	GWh	0.09	0.08	0.09	0.13	0.18	0.19	0.09
VUI								
VUI	Unit	2014	2015	2016	2017	2018	2019	2020
Non- commercial	GWh	2.25	2.25	2.64	2.95	3.02	3.40	3.08
Commercial	GWh	3.08	3.37	3.56	3.45	3.49	3.63	3.25
Industrial	GWh	2.36	2.46	2.77	2.59	2.69	3.40	3.49
Other *	GWh	0.24	0.25	0.31	0.32	0.55	0.54	0.29
Total	GWh	7.93	8.32	9.29	9.31	9.75	10.97	10.11
Losses	GWh	1.07	1.18	0.83	1.18	1.46	1.01	0.84

* VUI 2020 data is inclusive of Luganville, Port Olry, Talise (Maeno), Ambae and Vanua Lava.