

# ENERGY REGULATORY SURVEY AND ASSESSMENT REPORT FOR THE PACIFIC ISLANDS



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# ENERGY REGULATORY SURVEY AND ASSESSMENT REPORT FOR THE PACIFIC ISLANDS

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National  
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## List of Acronyms or Abbreviations

ADB	Asian Development Bank
APT	Asia-Pacific Telecommunity
CAIDI	Customer Average Interruption Duration Index
CAPEX	Capital Expenditures
CEFI	Center for Excellence in Financial Inclusion (PNG)
CIIC	Cook Islands Investment Corporation (Cook Islands)
CLO	Crown Law Office (Niue)
CPA	Certified Public Accountant
CPI	Consumer Price Index
DER	Distributed Energy Resources
DG	Distributed Generation
EE	Energy Efficiency
FCAS	Fragile and Conflict Affected Situations
FCCC	Fijian Competition & Consumer Commission
ICT	Information and Communications Technology
ITU	International Telecommunications Union
PP	Independent Power Producer
kWh	kilowatt hour
LPG	Liquefied petroleum gas
MEPS	Minimum Energy Performance Standards
MW	Megawatt
NARUC	National Association of Regulatory Utility Commissioners (USA)
NDC	Nationally Determined Contribution
NEA	National Energy Authority (PNG)
NUC	Nauru Utilities Corporation
NZ	New Zealand
OMRS	Open Merit Recruitment System
PICs	Pacific Island Countries
PPUC	Palau Public Utilities Corporation
OPERA	Office of the Pacific Energy Regulators Alliance
OOTR	Office of the Regulator (Samoa)
O&M	Operations & Maintenance
PDP	Power Sector Development Plan
PEWA	Palau Energy and Water Administration
PIC-12	Pacific Islands Countries
PNG	Papua New Guinea
PPL	PNG Power Ltd
PPA	Power Purchase Agreement
PPP	Public Private Partnerships
QoS	Quality of Service
RE	Renewable Energy
SAIDI	System Average Interruption Duration Index
SAIFI	System Average Interruption Frequency Index
SDG	Sustainable Development Goals
SOE	State-Owned Enterprises
SP	Solomon Power
SPC	Secretariat of the Pacific Community
Sq.km	square kilometer
TA	Technical Assistance
TEC	Tonga Electricity Commission
TAU	Te Aponga Uira electricity utility (Cook Islands)

TMUA	Te Mana Uira o Araura electricity utility (Cook Islands)
URA	Utilities Regulatory Authority (Vanuatu)
USoA	Uniform System of Accounts
WACC	Weighted Average Cost of Capital



## Executive Summary

### **The Establishment of an Office of Pacific Energy Regulators Alliance (OPERA)**

Electricity regulators in Samoa, Tonga, and Vanuatu established OPERA in December 2016 as a regional hub for energy regulators with specific focus in the electricity sector. OPERA was formally endorsed at the Pacific Energy Ministerial meeting held in Samoa in November 2019 with support from the Asian Development Bank (ADB) and the Secretariat of the Pacific Community (SPC) as the Secretariat.<sup>1</sup> The role of the Alliance is to provide capacity building and knowledge-sharing support to existing regulators, along with assistance to governments where regulatory capacity is nascent or non-existent.

ADB is supporting regional cooperation and the progressive regulation of energy utilities in the Pacific by enabling OPERA to deliver capacity building interventions, lead the generation and exchange of knowledge and skills, and leverage Pacific Developing Member Countries' limited resources to address common sector development issues and challenges. OPERA will conduct country-based consultations with development partners, encouraging a regional approach in supporting regulatory reforms and capacity building activities.

The SPC continues its strong support to OPERA in strengthening the Alliance's network, including coordinating activities, social media, and consultants' outputs/deliverables. The SPC will also lead the coordination of OPERA's monthly virtual coordination meetings. To date, eight Pacific Island countries (PICs), including the founding members (i.e., Samoa, Tonga, Vanuatu, the Republic of Fiji, the Cook Islands, the Republic of Palau, Papua New Guinea [PNG], and the Solomon Islands) have joined the Alliance and are currently active members under a formal Memorandum of Understanding signed by OPERA members and the Pacific Community. Kiribati and Niue are applying for membership.

The 2022 OPERA Annual Meeting was held in Nadi, Fiji, on October 11, with subsequent dialogue during October 12-14 as part of ADB-supported training workshops. It was attended by all OPERA member countries and provided an opportunity for participants to meet in person and discuss the latest developments in energy regulation, key challenges, and opportunities in enhancing regulation and tariff frameworks in the Pacific. During the meeting, the OPERA members elected the Tonga regulatory authority as chair and the Samoa regulatory authority as vice-chair of OPERA.

Additionally, during the meeting, the National Association of Regulatory Utility Commissioners (NARUC) and OPERA formally signed a Memorandum of Understanding that enables both parties to engage in regional capacity building and exchange information. NARUC shared lessons learned from major regional cooperation initiatives and introduced different approaches for creating more sustainable regional alliances and networks with diverse funding bases and activities. OPERA's next actions will focus on continued training and capacity building. This will help to ensure strong independent regulatory frameworks for Pacific regulators with shared resources from and collaboration with other international regulatory associations and stakeholder organizations.

### **The Survey's Regulatory Framework**

The regulatory framework described below has been used for the design of the scope of the survey under consideration. As a fundamental principle, a sound regulatory framework implemented by an effective regulatory agency provides the foundation for a well-functioning energy sector. Regulators should possess the following principles as outlined in the below figure to support a fair and efficient

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<sup>1</sup> The SPC is an international development organization, owned and governed by 27 countries and territory members since 1947. The SPC promotes regional programs to develop the technical, professional, scientific, research, planning and management capability of PICs. The agency has three main divisions: land, marine and social. The SPC's headquarters are in Noumea with a sub-branch in Suva.

energy sector: autonomy, authority, accountability, and ability.<sup>2</sup>

**Figure 1: The 4A's**



These principles enable regulators to implement and oversee regulations that promote financially and socially responsible sector growth to meet national goals. They assist regulators in defining their contribution to a functional energy sector and inform regulators about how to collaborate with ministries and other government entities. These principles also help regulators balance competing priorities and create a fair system for consumers, utilities, and investors. Regulatory frameworks aligned with these principles support an enabling environment for investment, promote energy security and reliability, and protect consumers. With the creation of separate regulatory agencies, the governments of several countries in the Pacific (i.e., the Cook Islands, Fiji, Palau, PNG, Samoa, Tonga, and Vanuatu) have recognized the importance and role of specific agencies to perform regulatory functions.

### Energy Regulatory Survey and Assessment Report – Objectives and Scope

In the above context, NARUC distributed a survey between July and October 2022 to outline the status of the regulation of power sector utilities in the PICs, Fiji, and PNG. The survey was designed to outline the regulator's role in addressing the countries' key development challenges and facilitating actions toward the achievement of their strategic development objectives in terms of providing regulatory incentives for:

- Improving the performance of electricity utilities to ensure sustainable and reliable electricity supply through proper tariff structuring, sound regulatory accounting and reporting, and adequate technology standards and licensing

<sup>2</sup> Archer, R. "Autonomy-Authority-Accountability-Ability (AAAA): Key Characteristics of Regulatory Commissions."



- Developing renewable energy (RE) to reduce dependence on imported fuels for power generation, thereby reducing the cost of electricity supply and facilitating the achievement of emissions reductions and decarbonizations objectives
- Improving access to electricity through on-grid and off-grid electrification programs
- Attracting private investments in the electricity sector through various forms of public-private partnerships (PPPs) and independent power producers (IPPs)
- Empowering women's participation in energy regulation

Furthermore, this assessment report is expected to serve as a foundational document for OPERA as it moves toward increased operationalization. In accordance with the OPERA member approved business plan, goal B, "OPERA will promote the independence, professionalism, accountability, and visibility of the national utility regulators." Sub-strategy I is to "serve as an information clearinghouse to promote good regulatory practices, common standards and benchmarks among its members."

The institutional capacity, independence, and scope of the regulatory mandate of individual regulatory entities was also assessed within the survey. The preliminary findings of the survey were presented at the OPERA Annual Meeting on October 11-16, 2022. The current report presents the survey findings in detail. In addition to addressing the above-mentioned objectives, the report is also expected to contribute to OPERA's operationalization as an information clearinghouse to promote good regulatory practices and common standards among its members and provide benchmarks for future assessments regarding the key functions and capabilities of energy regulatory authorities. The survey and the related report reflect responses provided by the following countries: Fiji, Palau, Samoa, Tonga, Vanuatu, Nauru, Niue, Tuvalu, the Cook Islands, the Solomon Islands, and PNG (see map below).

**Figure 2: Map of Pacific Region Countries<sup>3</sup>**



The survey countries are representative of the key geographical, climate, and related development challenges faced by countries in the Pacific region. As mentioned earlier, the survey countries are small and physically detached from major markets, with limited natural resources (except for PNG) and narrow-based economies. They also have small populations spread across various islands and are vulnerable to external shocks. Except for PNG, the survey countries have a combined population of 2.3 million across a land area of 63,000 square kilometers (sq.km.) PNG alone has a population of 7.2 million with a land area of 462,800 sq.km.<sup>4</sup> The survey countries represent the great geographical diversity in the region, from Fiji, which is the largest country in the region (except for PNG) with a population of over 900,000, and land area of 18,000 sq.km; to Nauru and Tuvalu with estimated

<sup>3</sup> "Kiribati Map." Pinterest. <https://www.pinterest.com/pin/371195194257514595/>

<sup>4</sup> See summary table with country data in Annex I, and Annex 6 with country profiles.

populations of approximately 11,000 and 12,000 across land areas of 21 and 26 sq.km, respectively.<sup>5</sup>

The land territory of the survey countries is further fragmented into individual islands varying between nine islands comprising Tuvalu and Samoa and expanding to a range of 300 to 900 islands in a country across Palau, Fiji, PNG, and the Solomon Islands.<sup>6</sup> Furthermore, according to the World Risk Index 2020 rankings about countries' preparedness to address the impacts of climate change, the small island states in the South Pacific along with the Caribbean islands were disproportionately represented among high-risk countries. Vanuatu was ranked as the country with the highest disaster risk worldwide, followed by Tonga.<sup>7</sup>

The survey countries also represent key power sector challenges typical of small island countries related to:

- High dependence on imported fuel oil for power generation, driving tariffs to unsustainable levels and leading to high transaction costs in the economy, which in turn constrains development
- The low level of access to electricity in some of these countries, caused by the remoteness of individual islands and difficult rugged terrains and aggravated by a lack of investment.

All survey countries except for PNG, Samoa, and Fiji, depend on imported diesel fuel for more than 50% of their generation mix. Dependence on imported fuel is extremely high in Tuvalu, exceeding 80%, and peaking at 92% of total installed generation capacity in the Solomon Islands and 99% of total installed generation capacity in Palau.<sup>8</sup>

The extreme dependence on imported diesel fuel in the Solomon Islands has triggered one of the highest global electricity prices exceeding 80 U.S. dollar cents (USc)/kilowatt hour (kWh), followed by heightened cost of electricity supply above 40 USc/kWh in the other Pacific islands countries (PICs) with very high dependence on imported diesel fuel. These include Tuvalu (81%), Palau (99%), and the Cook Islands (65%), followed by Vanuatu with an 81%<sup>9</sup> dependence on fuel imports for its power generation capacity.<sup>10</sup>

Power sector challenges in countries with high dependence on imported fuel for power generation, such as the Solomon Islands (99%) and Vanuatu (81%), have been further compounded by a low level of access to electricity – 16% in the Solomon Islands and 38% in Vanuatu. Access to electricity also remains low at 13% on the island portion of PNG's territory,<sup>11</sup> where 34% of the installed generation capacity depends on imported petroleum products.<sup>12</sup>

The above-mentioned country and power sector constraints have pre-determined the scope of the regulatory survey to review potential regulatory incentives to attract private investments and improve overall utility performance with the aim of:

- Promoting RE and energy efficiency (EE) improvements toward reducing dependence on fuel imports for power generation
- Expanding grid-connected and off-grid electrification solutions to improve access to electricity

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<sup>5</sup> Ibid.

<sup>6</sup> Ibid.

<sup>7</sup> The World Risk Index 2020 rankings is important because it gives an idea of the preparedness of 181 countries across the globe to tackle the effects of climate change (Source: "World Risk Index (2020) - An Overview." BYJU's. <https://byjus.com/current-affairs/world-risk-index/>).

<sup>8</sup> See Annex 6 for country profiles.

<sup>9</sup> Source: Vanuatu regulator

<sup>10</sup> See summary table with country data in Annex 1, and Annex 6 with country profiles.

<sup>11</sup> PNG's territory is comprised of the mainland and islands around the mainland (see Annex 6 with country profiles for details).

<sup>12</sup> Ibid.

- Enhancing infrastructure resilience

The survey also focuses on reviewing the soundness of and legal frameworks of the regulatory entities as a key enabling factor for conducting their regulatory functions along with opportunities to empower women's participation in energy regulation as a contribution to overall gender equity initiatives.

### **Survey Methodology**

As mentioned earlier, the survey was designed within the above-described regulatory framework. This report aims to address the two-pronged objective of the survey:

- Outline the status of the regulation of power sector utilities in the PICs, Fiji, and PNG from the point of view of addressing the countries' key development challenges
- Facilitate actions toward the achievement of strategic development objectives and provide a foundation for the increased operationalization of OPERA

To provide an overview of the status of the regulation of power sector utilities, surveyed countries filled out a questionnaire designed to contain a cross-section of key regulatory functions and key priority development areas of the power sectors.<sup>13</sup> The questionnaire was distributed to relevant counterparts in the survey countries, who were identified with the assistance of OPERA and ADB staff. The initial written responses were reviewed, and in most cases the survey team sent a second round of clarifying questions, which were also addressed by the survey counterparts. NARUC held face-to-face interviews to go over the survey questionnaire with some of the representatives of the OPERA countries during the October 2022 OPERA Annual Meeting in Fiji. These countries had not submitted written responses at that time.

The findings on the status of the regulation of power sector utilities are presented in a section on key findings for each of the report's thematic survey areas. The objective of facilitating regulatory actions to achieve countries' development objectives and increase OPERA's functionalization has been achieved respectively by further outlining the following in each thematic survey area:

- General strategic recommendations for improvement in consideration of the findings on the status of regulating power utilities and international good practices relevant to the thematic survey area under consideration (to facilitate regulatory actions)
- Suggested actions to be undertaken and reported at the next OPERA Annual Meeting (to support OPERA's increased functionalizing by adjusting and customizing international good practices to the specific conditions and development priority needs of the surveyed countries through an action plan)

### **Summary of the Survey's Key Findings and Recommendations**

The following key findings and recommendations have been outlined along the key thematic areas of the survey. The recommendations have been based on relevant international good practices for initial consideration by all surveyed countries with subsequent fine-tuning to the individual countries' specific conditions and needs based on suggested additional assessments as a part of OPERA's increasing operationalization drive.

#### ***Institutional Soundness***

While the survey countries have well-defined roles, mandates, and functions of regulators in relevant national legislation, further improvements may be considered in relation to:

- Enhancing regulatory independence
- Optimizing the scope of sectors under one regulator and the related organizational structure and staffing of the regulator

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<sup>13</sup> See Annex 10 with the actual text of the survey questionnaire.

- Enhancing in-house regulatory capacity, including the capacity for public communications and stakeholder engagement

### ***Ensuring Sustainable Power Supply***

While the survey countries apply a cost plus/revenue requirements-based approach to electricity tariff design coupled with adjustments for fuel prices, a ceiling of losses to be recovered through tariffs, and resilience measures, further improvements may be considered in relation to:

- Expanding the revenue requirement/building blocks approach to tariff design with additional allocation of costs of electricity supply to individual consumer categories and applying an incentives-based approach to tariffs design with key performance indicators
- Ensuring timely tariff updates for rising fuel costs to prevent actual tariffs slipping below costs
- Realigning lifeline tariffs and direct subsidies to cover only eligible/low-income electricity consumers
- Adopting specific regulatory accounting, reporting, and auditing systems to ensure adequate accounting of all reported costs of power supply and the validation of the relevance of incurring such costs
- Expanding resilience measures to more PICs based on preliminary assessments of the resiliency needs of power infrastructure, including cybersecurity considerations

### ***Development of RE and EE***

While the survey countries have strategies and targets for RE and EE and apply various related incentives, it is recommended to further consider:

- Developing specific action plans with timelines and milestones toward achieving the established targets
- Using the full menu of RE/EE policies in individual countries in a consolidated and focused way, as individual countries currently apply only some measures
- Developing national or join international emissions trading and carbon pricing mechanisms under the Paris Agreement
- Coordinating the work of national RE/EE agencies with national power sector planning agencies to ensure adequate consideration of RE and EE improvements in power sector development plans

### ***Improving Access***

Access to electricity varies widely in the PICs from 16% to 100%, and some countries have some experience with promoting mini-grids, distributed generation (DG), rural electrification funds, subsidies for connections of rural consumers, and net metering. Increasing urbanization has led to an increase in residential demand for electricity, which proves challenging to address for utilities and regulators. In this context, it is recommended to further consider:

- Expanding the application of grid codes and connection rules in off-grid areas
- Developing/enhancing models for defining off-grid connection costs and tariff mechanisms
- Putting in place/expanding regulations for DG/prosumers
- Designing mitigating measures to address the impact of accelerated urbanization on the rising demand for electricity in urban areas

### ***Attracting Private Investments in the Electricity Sector***

Concessions are the most common form of PPPs the survey countries stipulated in their electricity acts or specific PPP policies. Tariffs for power purchase agreements (PPAs) applied to competitively tendered IPPs are approved in varying degrees by some regulators. In this context, it may be helpful to further consider:

- Concessional/blended financing on the public side of the PPPs to lower the overall cost of financing and subsequently tariffs for end-consumers
- Expanding the application of competitive tenders for the selection of IPPs and subsequent signing of PPAs to prevent unsolicited proposals and bring the cost of tariffs down
- Regulators approving PPAs should ensure a balanced impact on demand and the affordability of the PPA price in relation to end-consumers

***Empowering Women's Participation in Energy Work***

The survey countries have good examples of gender-inclusive recruitment and employment regulations, policies, and action plans stipulating gender equality in employment opportunities along with initiatives for promoting women in leadership and technical positions as well as entrepreneurial energy activities. In this context, it is recommended to further consider:

- Expanding the application of regulations stipulating gender equality and equal employment opportunities across the PICs
- Facilitating scholarships/internships for women in energy-related areas of work and study
- Providing international experience with micro-finance for women entrepreneurs
- Promoting regional forums for women in energy to share experiences and outline ways to move forward

## Findings and Recommendations by Key Thematic Survey Areas

### Institutional soundness – Regulatory Independence and Scope of the Regulatory Mandate

#### Key Findings

According to international experience, the regulator's legal mandate, functions, objectives, independence, and accountability are usually defined through the adoption of relevant laws by the national legislative body (parliament) or another legislative entity, or by a government decree/ordinance. Upon its establishment, the regulator is not able to modify these aspects on its own, as they were defined by other entities prior to the regulator's establishment and are therefore outside the control or influence of the regulator. In this context, these regulatory aspects are said to form the external regulatory governance structure that defines the institutional and legal framework in which the regulator operates.<sup>14</sup>

The sustainability of the regulatory institutional design depends in turn on three key elements:

- The regulatory mechanism
- The existence of an independent, economically autonomous, well-funded, and technically qualified regulatory agency
- Accountability mechanisms<sup>12</sup> to prevent favoritism<sup>15</sup>

These aspects are discussed further below.

Out of the 11 surveyed countries, regulatory mandates and functions are well-defined by relevant legislation in six of them. Three countries have no regulators, and in the remaining two countries, regulatory legislation is under preparation in one and is spread across various laws and regulations in another. In addition, out of the 11 surveyed countries, only four regulators seem to be able to act independently.

Some of the surveyed countries have well-outlined accountability arrangements in the relevant regulatory legislation regarding how regulators report to stakeholders. All surveyed countries cover more than one sector, except for Tonga where the regulator covers only electricity. The key regulatory functions of tariff setting, licensing, standards, and service quality have also been well covered in all the surveyed countries, along with dispute resolution arrangements in most of them as it is critical for attracting investors. A summary of the relevant findings for individual countries is presented in the table below, followed by a more detailed discussion of the findings.

**Table 1: Overview of regulatory mandate definition, decisions independence and regulatory function coverage**

Country	Well-defined mandate & functions	Independence of decisions	Sector(s) regulatory coverage	Coverage of key regulatory functions
<b>Fiji</b>	Yes	Yes	Multi-sector	Yes*
<b>Palau</b>	Yes	Partial	Multi-sector	Yes* plus <ul style="list-style-type: none"> <li>• Review sector plans</li> <li>• Integrate RE and EE into mainstream energy policy</li> </ul>

<sup>14</sup> "Electricity Regulatory Index for Africa 2020." African Development Bank, p.p. 26-27. November 2020.

<https://www.afdb.org/en/documents/electricity-regulatory-index-africa-2020>

<sup>15</sup> "Institutional Design." Body of Knowledge on Infrastructure Regulation.

<https://regulationbodyofknowledge.org/regulatory-process/institutional-design/>



<b>Samoa</b>	Yes	Yes	Multi-sector	Yes* plus • Definition of power market structure and monitoring • Review of power sector plans • Dispute resolution • Consumer protection
<b>Tonga</b>	Yes	Yes	Multi-sector	Yes* plus • Dispute resolution • Consumer protection
<b>Vanuatu</b>	Yes*	Yes	Multi-sector	Yes* plus • Dispute resolution with IPPs • Power market structure • Consumer protection
<b>Nauru</b>	No regulator	N/A	Multi-sector	Yes*
<b>Tuvalu</b>	No regulator	N/A	Electricity only	Yes*
<b>Solomon Islands</b>	No regulator	N/A	Electricity only	Yes* plus • Promotion of RE
<b>Cook Islands</b>	Partially**	Partial	Multi-sector	Yes* plus • Dispute resolution
<b>Niue</b>	No*		Multi-sector	Yes* plus • Consumer protection
<b>PNG</b>	Yes	Partial	Multi-sector	Yes* plus • Project management (rural electrification roll-out) • Community service development

**Notes:**

**N/A\*** indicates that in the absence of a regulator, the utility in the respective country performs regulatory functions

**X\*** indicates coverage by the respective regulator the key services related to tariffs, licensing, standards, and service quality

**X\* plus** indicates coverage of these regulatory activities plus the additional activities listed in the bullets below each Yes\*plus reference

**\*\*** References to regulators' roles are spread across the various Acts and regulations in Cook Islands, but there is no definition of a single regulator

**No\*** indicates that no law on infrastructure regulations – it is under preparation

**\*\*\*** Two utilities provide on electricity services subject to regulation (by the two utilities)

Local governments in the outer islands regulate electricity and water services. Regulatory independence has been assessed in consideration of dependence on the local government and legislature/parliament. There has been no consideration of potential dependence related to sources of financing, including fees and penalties imposed on regulated entities, which impact regulatory independence. Partial independence implies dependence on instructions from the government and parliament in relation to some regulatory decisions/activities.

**Regulatory Mandate and Functions**

Establishing a regulator by an act of the legislature mitigates the potential for political interference, enhances the credibility of the regulator's actions, and subsequently boosts investor confidence.<sup>16</sup> In

<sup>16</sup> "Electricity Regulatory Index for Africa 2020." African Development Bank, p.27.

this context, out of the 11 surveyed countries, regulatory mandates and functions have been well-defined by relevant legislation in six of them: Fiji, Palau, Samoa, Tonga, Vanuatu, and PNG.

There are no regulators in Nauru, Tuvalu, or the Solomon Islands. Local utilities perform regulatory functions in these countries. A review of the 1969 Electricity Act of the Solomon Islands has recommended the establishment of an independent regulator by 2024-2025. Niue has no law yet in place that stipulates the structure, functions, mandate, and level of independence for the regulator for the electricity sector. An overall regulatory framework for infrastructure is under preparation. In the Cook Islands, references to the regulator's role are spread across various acts and regulations but are not specifically stated for a single regulator. However, there are legislations that stipulate some principal functions of the energy regulator.

### **Regulatory Independence**

In general, the regulatory institution is considered independent if it operates under the law, has arms-length relationships with private interests and political branches of the government, and has organizational autonomy, including economic autonomy.<sup>17</sup> Furthermore, regulatory independence implies independent decision-making, including independence from the government and the legislature; independence from stakeholders and market players; and financial and budgetary independence.<sup>18</sup> A lack of independence from stakeholders and the government and related exposure to political pressure<sup>19</sup> limits the regulator's ability to ensure the sustainable development of the regulated (electricity) sector and consequently erodes its credibility.<sup>20</sup>

Sustainable and independent sources of funding enhance regulatory independence. Government funding compromises the independence of the regulator, and reliance on penalty fees is unsustainable and could affect the objectivity of the regulator.<sup>21</sup> Out of eight existing regulatory entities within the 11 surveyed countries, only four regulators (i.e., Fiji, Tonga, Samoa, and Vanuatu) seem to be able to act independently. Tonga's regulator must still report to a minister and parliament for informational purposes. The independence of the regulators in Vanuatu and PNG are defined by law. Vanuatu's regulator is formally accountable for reporting purposes to a minister and parliament. PNG's regulator has an obligation to comply with policy directions provided in writing by the Minister of Energy.

The regulator in Palau coordinates tariffs with Congress and the President's Office. Regulation in the Cook Islands has been assigned to offices and departments reporting to the Minister of Energy and Prime Minister's office, and in Niue to a Crown Law Office under the Prime Minister for legal matters and Departments at the Ministry of Infrastructure – Communications, Utilities, and Transport. Since there are no regulators in Nauru, Tuvalu, and the Solomon Islands, local utilities in these countries define tariffs and their governments approve them.

### **Regulatory Accountability**

Regulatory accountability implies regulators' obligation to report their activities to stakeholders to ensure that they do not deviate from their activities in the mandate with which they have been established. Key accountability aspects include transparency activities in terms of public participation in stakeholder consultations on upcoming regulatory decisions, along with adequate public reporting of regulatory activities and decisions. In addition, the availability of mechanisms to challenge regulatory decisions increases investor confidence.<sup>22</sup>

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<sup>17</sup> "Institutional Design." Body of Knowledge on Infrastructure Regulation.

<sup>18</sup> "Electricity Regulatory Index for Africa 2020." African Development Bank, p.27

<sup>19</sup> An example of exercising political pressure on the regulator would be a pressure from the government not to raise tariffs to cost recovery level before an upcoming election in order to prevent a negative impact on the outcome of the election.

<sup>20</sup> "Electricity Regulatory Index for Africa 2020." African Development Bank, p.28

<sup>21</sup> Ibid.

<sup>22</sup> "Electricity Regulatory Index for Africa 2020." African Development Bank, p..29

Some of the surveyed countries have well-outlined accountability arrangements in the relevant regulatory legislation for reporting to stakeholders, as are the above-mentioned examples of Tonga and Vanuatu. Most of the surveyed countries have dispute resolution mechanisms for regulatory decisions. The remaining accountability aspects related to transparency are discussed further below within the internal regulatory governance structure.

### **Scope of Regulation – One or Multiple Sectors**

Regulatory agencies can be industry-specific, sector-wide, or multi-sector depending on the size of the industries, scarcity of human resources, political risks, the imperfection of the decision making process, coordination capacities, and the relevance of industry boundary problems.<sup>23</sup> Regulators cover multiple sectors, except for Tonga's regulator, which only covers electricity. Electricity and water are the most common sectors under one regulatory entity (i.e., Fiji, Palau, Vanuatu, the Cook Islands – local authorities on Outer Islands – Pa Enua). The regulators in Fiji, Samoa, PNG, and Niue cover additional sectors.

The Fijian regulator has the broadest coverage with six sectors:

- Electricity
- Water
- Refined fuel products
- Liquefied petroleum gas (LPG)
- Cement
- Steel

The Samoan regulator covers:

- Telecommunications
- Broadcasting
- Postal
- Electricity

PNG's regulator covers the electricity supply industry, the downstream gas industry, and the bulk import of petroleum and petroleum products. Niue's Department of Utilities for Power Supply also includes regulatory coverage of the building and constructions industries. In FCAS countries, where utilities perform regulatory functions, utilities in Nauru and the Solomon Islands cover electricity supply only, while Tuvalu's utility covers both the electricity and drinking water supply.

### **Scope of Regulatory Functions**

Key regulatory functions of tariff setting, licensing, standards, and service quality have been well covered in all the surveyed countries, along with dispute resolution arrangements in most of them, as it is critical for attracting investors. Some other regulators cover additional functions related to consumer protection (i.e., Vanuatu, Tonga, Samoa) power sector planning (i.e., Samoa), power markets (i.e., Samoa and Vanuatu), and the integration of RE and EE improvements (i.e., Palau).

In Vanuatu, concessionaires are subject to regulation by the Vanuatu regulator, except for one concession signed by the government before the establishment of the regulator in 2007. PNG's regulatory functions have been expanded with additional responsibilities for the project management of a rural electrification roll-out plan and community services development. Such additional responsibilities might divert the newly established regulator's focus on regulatory work.

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<sup>23</sup> "Institutional Design." Body of Knowledge on Infrastructure Regulation.

### Current Strengths and Key Recommendations for Improvement

The table below outlines current strengths and recommendations for improvement in the key areas under consideration in this section – regulatory independence and the scope of the regulatory mandate. The recommendations are related to the key findings in the key thematic areas of the survey discussed in this section and are based on relevant international good practices. These recommendations are intended to serve as a basis for designing customized action plans for regulatory improvements in individual countries and across groups of countries with common regulatory challenges.

**Table 2: Identified Strengths and General Recommendations for Improvement: Regulatory Independence and Scope of the Regulatory Mandate**

Identified Strengths among Surveyed Regulators and Utilities <sup>24</sup>	General Strategic Recommendations for Possible Improvement <sup>25</sup>
<ul style="list-style-type: none"> <li>Well-defined role, mandate, and functions of regulators in relevant legislation in some countries</li> </ul>	<ul style="list-style-type: none"> <li>Streamline regulatory legislation into one law on setting up an independent regulator, where necessary.</li> <li>Consider setting up independent regulators in Nauru, Tuvalu, and the Solomon Islands in the case of privately-owned utilities, where the regulator can balance the private supplier's profit maximizing drive with service affordability for consumers. In the case of state-owned utilities, the government can perform regulatory functions, although a separate regulator could further improve the performance of the state utility.</li> <li>Enhance regulatory independence               <ul style="list-style-type: none"> <li>Eliminate final tariff approval by the government in selected cases where separate regulatory entities exist</li> <li>Prohibit the regulator's executive and commissioners from having an interest in regulated utilities and serving in the government, private sector, and regulated entities for a period sufficient to eliminate potential conflicts of interest</li> <li>Review and amend, as applicable, some regulatory acts: First, remove provisions that allow an executive to overturn the decisions of the regulator to make provisions for a longer and fixed non-renewable term of office for commissioners.<sup>26</sup></li> <li>Stagger regulatory commissioners' terms of appointments throughout different time periods to ensure continuity between incumbents and new appointees</li> <li>Ensure guaranteed tenure and 'golden parachutes' in the terms of engagement for the chief executive officers (CEOs) of regulators to minimize political intrusion and interference<sup>27</sup></li> </ul> </li> </ul>

<sup>24</sup> In countries without formal regulators, such as Nauru, Tuvalu, and Solomon Islands, the survey covered the utilities that carry out regulatory functions.

<sup>25</sup> Recommendations are outlined by suggested priorities of the bulleted actions, starting with the top priority.

<sup>26</sup> Electricity Regulatory Index for Africa, 2020, African Development Bank p.52

<sup>27</sup> Ibid.

	<ul style="list-style-type: none"> <li>○ Stipulate that a commissioner can be removed from office only for a reasonable cause (i.e., not for political reasons)<sup>28</sup></li> </ul>
<ul style="list-style-type: none"> <li>• Good examples of arrangements for public communications and stakeholder engagements</li> <li>• Good examples of arrangements to ensure adequate application of standards and quality of service (QoS)</li> </ul>	<ul style="list-style-type: none"> <li>• Ensure a sustainable and independent source of funding for the regulator <ul style="list-style-type: none"> <li>○ Enable regulatory commissioners to approve a regulator's budget</li> <li>○ As applicable, eliminate requirements for governments to approve the regulator's budget</li> <li>○ Detail the regulator's long-term funding rules, including fees and levies to be approved by legislation, such as arrangements for ensuring transparency in using regulatory funds</li> <li>○ Set regulators' salaries higher than the salaries of the regulated entities</li> <li>○ Introduce annual audits of regulatory expenditures</li> </ul> </li> <li>• Enhance the regulator's accountability by introducing the following, as applicable: <ul style="list-style-type: none"> <li>○ Annual reports on regulatory activities</li> <li>○ Dispute resolution mechanisms enabling challenging regulatory decisions through a third-tier adjudication body or specialized tribunal outside the regular court system to avoid the latter's lengthy procedures<sup>29</sup></li> <li>○ Reviews aimed at <ul style="list-style-type: none"> <li>• Identifying potential opaque/corrupt practices and undertaking corresponding mitigating measures</li> <li>• Analyzing the performance of political appointees in comparison to elected Boards and governance, and designing corrective measures as needed</li> </ul> </li> </ul> </li> <li>• Optimize the scope of sectors under one regulator by undertaking a self-assessment (or getting one with outside assistance) of sector synergies and complementarities in having several industries under one regulator in consideration of inter-relations between industries' size and similarities; related risks; available human resources; and level of commonality in regulatory challenges to address.</li> </ul> <p>For example, electricity and water have similar structures in terms of clients, consumption patterns, and tariff structures, and therefore may be easier to regulate under one entity. However, what would be the rationale to regulate electricity, broadcasting, and postal services under one entity?</p>

<sup>28</sup> Melnykovich, Andrew. "Building Confidence in the Regulator through Effective Communications, Policies, and Procedures." Presentation during NARUC webinar on November 16, 2021.

<sup>29</sup> "Electricity Regulatory Index for Africa 2020." African Development Bank, p. 54

**Suggested Actions to be Undertaken and Reported at the Next OPERA Annual Meeting**

1. Undertake needs assessments to identify potential regulatory improvements in the individual OPERA member and candidate member countries within but not limited to the scope of the individual areas of recommendation for possible improvement in the above table, and namely:
  - Streamlining regulatory legislation
  - Evaluating the need to set up independent regulators in Nauru, Tuvalu, the Solomon Islands, and Kiribati
  - Exploring the potential for enhancing the independence of existing regulators
  - Ensuring a sustainable and independent source of funding for regulators
  - Assessing the adequacy of the current scope of sectors regulated by a single regulator in OPERA countries
2. Outline time-bound action plans in the above areas and outline technical assistance (TA) needs for their implementation.
3. Prepare presentations on the identified needs and related action plans for each of the above areas. Deliver the presentations at the next OPERA Annual Meeting.



## **Institutional soundness – Transparency and Accountability, Organization and Staffing, and the Capacity to Enforce Technical Regulations**

### **Highlights of Key Findings**

According to international good practices, transparency, public participation, predictability, and open access to information are key elements of internal regulatory governance. The use of information and communication technologies (ICT) plays a critical role in enhancing open access to regulatory information, and consequently the predictability of the regulatory decisions, dissemination of information, and communications between the regulator and the public. A key criterion of regulatory transparency is the level of accessibility and sharing of the regulatory decision-making process with stakeholders.

Transparency is a key aspect of a regulator's accountability. The transparency of regulatory activities is also a key factor contributing to regulatory confidence, credibility, legitimacy, and acceptance by stakeholders. The level of stakeholder participation in the regulatory decision-making process is another aspect contributing to the transparency and predictability of regulatory activities.<sup>30</sup> Highlights of findings related to all these aspects are discussed further below.

### **Transparency and Accountability**

Some regulatory commissions publish and explain their decisions, others hold in-person consultations, and some others have explicit dispute resolution functions. Ideally, all these regulators should have all these functions together.

### **Capacity for Public Communications and Stakeholder Engagements**

In most of the survey countries, utilities and regulatory entities have customer services departments, dedicated public communications officers, and in some cases entire outreach/communications departments with the involvement of senior management from utilities and regulators.

### **Organizational Structure**

The internal organizational structure of the regulatory entities participating in the survey includes a broad range of variations, such as regulators with structures covering key regulatory functions, others with narrower regulatory coverage, and others with regulatory functions spread among various agencies. In countries without regulators, utilities perform key regulatory functions.

### **Staffing**

The staffing of regulators in PICs is modest, commensurate with the relatively small size of regulated sectors. Staff have professional backgrounds in relevant regulatory activities.

### **Capacity to Enforce Technical Regulations**

Utilities and regulators in the surveyed countries have relevant staff to ensure the application of these standards. However, in some of these countries penalties for non-compliance are outdated and very mild, or rarely applied.

The findings in the above areas are presented by country in a table further below.

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<sup>30</sup> "Electricity Regulatory Index for Africa 2020." African Development Bank, p.30

**Table 3: Key Findings in Transparency and Accountability, Organizational Structure, and the Capacity to Enforce Technical Regulations**

Country <sup>31</sup>	Transparency and accountability for the regulator's activities	Organizational structure	Staff composition and capabilities, academic programs	Capacity and mechanism for enforcing technical regulations
<b>Fiji</b>  Fijian Competition & Consumer Commission (FCCC)	Yes	<ul style="list-style-type: none"> <li>• Tariffs</li> <li>• Licensing</li> <li>• Technical standards and quality</li> </ul>	<ul style="list-style-type: none"> <li>• Economist – 16%</li> <li>• Lawyers – 10%</li> <li>• Engineers – 1%</li> <li>• Financial Expert – 19%</li> <li>• Other professional background – 54% (mostly enforcement officers, support team)</li> </ul>	Yes <sup>32</sup>
<b>Palau</b>  Palau Energy and Water Administration (PEWA)	Yes	Director and 1-2 staff at present <ul style="list-style-type: none"> <li>• Finance/tariff</li> <li>• Planning/regulations</li> <li>• Data collections to determine nationally determined contributions (NDCs)</li> </ul>	<ul style="list-style-type: none"> <li>• Director served at the Board of the Palau utility</li> <li>• The current 1-2 staff have worked for the regulator before</li> </ul>	Yes
<b>Samoa</b>  Office of the Regulator (OOTR)	Yes	<ul style="list-style-type: none"> <li>• Tariffs</li> <li>• Financial evaluation of licenses</li> </ul>	<ul style="list-style-type: none"> <li>• Economists – 29%</li> <li>• Lawyers – 5%</li> <li>• Engineers – 24%</li> <li>• IT officers – 10%</li> <li>• Financial experts – 24%</li> <li>• HR officers – 10%</li> </ul> Total staff – 21	Yes
<b>Tonga</b>  Tonga Electricity	Yes	<ul style="list-style-type: none"> <li>• CEO</li> <li>• Financial controller/regulatory auditor</li> </ul>	<ul style="list-style-type: none"> <li>• Electrical engineering</li> <li>• Accounting</li> </ul>	Yes

<sup>31</sup> Further details on the topics in this table are provided in Annex 3.

<sup>32</sup> “Yes” indicates that the corresponding regulators have in varying degrees arrangements for public communications and enforcement of technical standards. Further details on these topics are presented in Annex 4.

Commission (TEC)		<ul style="list-style-type: none"> <li>• Technical manager</li> </ul>	<ul style="list-style-type: none"> <li>• Computer science</li> </ul>	
<b>Vanuatu</b>  Utilities Regulatory Authority (URA)	Yes	<ul style="list-style-type: none"> <li>• Economics and tariffs</li> <li>• Finance</li> <li>• Legal</li> <li>• Engineering</li> </ul>	<ul style="list-style-type: none"> <li>• Economists – 13% (2)</li> <li>• Accounting &amp; Finance – 13% (2)</li> <li>• Engineers –25% (4)</li> <li>• Corporate – 38% (6)</li> <li>• Consumer Specialist 6% (1)</li> </ul> <p>Current number of staff – 15</p>	Yes
<b>Nauru</b>  Nauru Utilities Corporation (NUC)	There is no regulator. The utility handles public communication.	Utility staff are involved in tariff setting and technical standards compliance.	The NUC has managers for power generation, distribution, systems control, and corporate and customer services.	Utility technical staff ensure compliance with standards and QoS requirements.
<b>Tuvalu</b>  Tuvalu Electricity Corporation (TEC)	There is no regulator. The utility handles public communication.	Utility staff are involved in tariff setting and technical standards compliance	<ul style="list-style-type: none"> <li>• The Chairman of the TEC's Board is the Secretary of the Ministry of Transport, Energy, and Tourism.</li> <li>• The other four members are from the public and their backgrounds vary from economics, finance, and management.</li> </ul>	Utility technical staff ensure compliance with standards and QoS requirements.
<b>Solomon Islands</b>  Solomon Power (SP)	There is no regulator. The utility handles public communication.	<p>The following divisions report to the CEO of SP:</p> <ul style="list-style-type: none"> <li>• Engineering</li> <li>• Special projects and planning</li> <li>• Legal</li> <li>• Corporate division</li> <li>• Customer service</li> <li>• ICT</li> <li>• Financing</li> </ul>	<ul style="list-style-type: none"> <li>• Electrical engineering – 10 staff (i.e., electrical technicians and engineers)</li> <li>• Accounting/certified public accountant (CPA)</li> <li>• Computer science</li> <li>• Engineering degrees can be obtained in Fiji, New Zealand, and Australia. The Solomon Islands National University offers certificates in electricity trade. The University of</li> </ul>	The Regulating Department enforces technical regulations through the engineering staff.

		<ul style="list-style-type: none"> <li>Capital works – new construction, new generation, network extension</li> </ul>	the South Pacific offers certificates and diplomas in accounting and economics.	
<b>Cook Islands</b>  Office of the Prime Minister, Utilities (TAU and TMUA), Ministry of Infrastructure, Investment Corporation	Yes	Regulatory functions have been spread across various agencies, including an Office of the Energy Commissioner under the Office of the Prime Minister, electricity utilities, local administrations on outer islands, the Ministry of Infrastructure, and investment corporations.	The Office of the Energy Commissioner is not fully operational and not fully staffed yet.	Yes
<b>Niue</b>  Crown Law Office – Government of Niue	Yes	A new proposed regulatory structure includes: <ul style="list-style-type: none"> <li>Department of Utilities responsible for water, building, and constructions</li> <li>RE</li> <li>Treasury</li> <li>Communications and broadcasting standards</li> </ul>	The public sector employment authority (the Niue Public Services Commission) ensures adequate staffing with regulatory experts.	Yes
<b>PNG</b>  National Energy Authority	Yes	The regulator has the following divisions: <ul style="list-style-type: none"> <li>Economic regulation</li> <li>Technical regulation</li> <li>Policy planning and research</li> <li>Community outreach</li> <li>NEA MD's Office</li> </ul>	Currently, about 25% of the needed regulatory staff have been recruited.	Yes

## **Institutional soundness – Transparency and Accountability, Capacity for Public Communications, and Stakeholder Engagements**

### **Transparency and Accountability**

Some regulatory commissions publish and explain their decisions, others hold in-person consultations, and some others have explicit dispute resolution functions. Ideally, all these regulators should have all these functions together.

#### ***Publishing and explaining regulatory decisions***

The level of preliminary public discussions about upcoming tariff increases and other regulatory matters varies by country. Regulators and utilities in all surveyed countries (except for Niue) publish applicable/approved electricity tariffs and annual activities reports on their websites, which are also accessible through social media (i.e., Facebook, LinkedIn) on occasion (e.g., the Solomon Islands and PNG). Information about the Niue Power Corporation is offered through government platforms.

- Fiji – press releases are issued explaining proposed regulatory changes, including tariff increases. Queries are addressed at the time of the press release and after a decision is made.
- Tonga – tariffs and re-set proposals are published in the media for comments prior to finalization.

#### ***In-person consultations***

- Vanuatu, the Solomon Islands, the Cook Islands, and Niue – in-person stakeholder consultations are held to discuss tariffs. Regulatory information is also published by the media in Vanuatu, the Cook Islands, and Niue.
- Palau follows public notice procedures in the national code.
- Samoa has a well-defined mechanism for public participation in regulatory decisions.

#### ***Explicit dispute resolution functions***

- Samoa, Tonga, Vanuatu, and PNG have explicit references in their mandate regarding dispute resolution for regulatory activities.

### **Capacity for Public Communications and Stakeholder Engagements**

In most of the surveyed countries, utilities and regulatory entities have customer service departments, dedicated public communications officers, and in some cases entire outreach/communications departments with the involvement of senior management from utilities and regulators. The CEO and the Manager of the Technical Division at the Tonga regulator, the Executive Officer at the Vanuatu regulator, and the Managing Director's (MD's) Office of the PNG regulator all manage communications with the public.

Entities that have established entire divisions for public communications within their organizational structures include Tuvalu's utility with a Department for Public Engagements, and PNG's regulator with a Community Outreach Division. In Niue, the government has established a sector that is responsible for all government press releases and TV/radio media, including social media platforms.

The Fijian regulator and the Cook Islands' utilities each have dedicated communications officers. The utilities of Nauru and the Solomon Islands have a customer service manager and customer service department. However, the Samoan regulator does not have a media policy, and communications with public are managed by all energy sector stakeholders. The Palau regulator does not have a designated person responsible for public communications.

### **Current Strengths and Key Recommendations for Improvement**

The table below outlines current strengths and recommendations for improvement in the key areas under consideration in this section – transparency, accountability, capacity for public communications,

and stakeholder engagements. The recommendations are related to the key findings in the key thematic areas of the survey, discussed in this section, and are based on relevant international good practices. These recommendations are intended to serve as a basis for designing customized action plans for regulatory improvements in individual countries and across groups of countries with common regulatory challenges.

**Table 4: Identified Strengths and General Strategic Recommendations: Transparency and Accountability, Capacity for Public Communications, and Stakeholder Engagements**

Identified Strengths among Surveyed Regulators and Utilities <sup>33</sup>	General Strategic Recommendations for Possible Improvements <sup>34,35</sup>
<ul style="list-style-type: none"> <li>• Good examples of arrangements for public communications and stakeholder engagements</li> </ul>	<p>Consider developing an effective communications strategy for regulators along the following key building blocks:</p> <ul style="list-style-type: none"> <li>• Clearly convey regulatory autonomy in terms of the regulator's mandate to implement the laws and policies approved by the government's legislative body</li> <li>• Communicate the regulator's mission clearly and concisely to ensure that the public is receiving reliable utility services at just and reasonable rates. Plan to ensure that the regulator's mission is adopted, supported, and enforced by all members of the regulatory agency, leadership, and staff.</li> <li>• Ensure the provision of accurate and unbiased information to the public             <ul style="list-style-type: none"> <li>○ Ensure public access to all statutes and regulations governing regulated utilities, including utility rates and terms of service. This would include the service reliability standards a utility must provide, the consumer's bill of rights, and the rights of a utility to recover its investments in infrastructure plus a reasonable return on its investments from its ratepayers.<sup>36</sup></li> <li>○ Undertake measures to protect market-sensitive information that a utility must file with the regulator or information related to critical infrastructure</li> <li>○ Identify "would-be influencers"<sup>37</sup> and stakeholders in the industry and develop a two-way mechanism for providing accurate information about pending rate case applications.</li> </ul> </li> <li>• Ensure transparency in regulatory activities and the decision-making process to strengthen regulatory credibility and</li> </ul>

<sup>33</sup> In countries without formal regulators, such as Nauru, Tuvalu, and the Solomon Islands, the survey covered the utilities that carry out regulatory functions.

<sup>34</sup> Recommendations are prioritized in the order they appear.

<sup>35</sup> Choueiki, Hisham. "Promoting Transparency and Public Participation in Energy Regulation: A Communications Primer for Utility Regulators." National Association of Regulatory Utility Commissioners. September 2019.

[https://pubs.naruc.org/pub/F358864A-0EC2-9185-D0B5-5A6B9C13BEA6?\\_gl=1\\*khthq\\*\\_ga\\*MTA0Njg4Njk4Ni4xNjYyMTIyODc0\\*\\_ga\\_QLH1N3Q1NF\\*MTY3MzAzNjM0MC4xMDYuMC4xNjczMDM2MzQwLjAuMC4w](https://pubs.naruc.org/pub/F358864A-0EC2-9185-D0B5-5A6B9C13BEA6?_gl=1*khthq*_ga*MTA0Njg4Njk4Ni4xNjYyMTIyODc0*_ga_QLH1N3Q1NF*MTY3MzAzNjM0MC4xMDYuMC4xNjczMDM2MzQwLjAuMC4w)

<sup>36</sup> Ibid, p.9

<sup>37</sup> "Would-be influencers" can be members of the news media, members of the legislature (parliament), other government agencies, and consumer advocacy agencies.



	<p>trustworthy relations with stakeholders</p> <ul style="list-style-type: none"> <li>○ Regulators should adopt a code of conduct and ethics rules for their activities and should make them public.</li> <li>○ Board/commission meetings should be open to the public and, if possible, available for public viewing by electronic means.</li> <li>○ Legalize requirements for public consumer hearings as a part of regulatory approval procedures</li> <li>○ Announce to the public in advance that a utility is planning to file a change in tariff application with the regulator. This is a key element of any effective communications strategy. <ul style="list-style-type: none"> <li>• The regulator should issue and post a press release that includes a consumer hearing invitation to all stakeholders on its website/through social media links.</li> <li>• The regulator may also obligate the utility to do so through a bill insert, broadcast TV or radio, print media, and the utility's website and social media. The press release should include a summary of the increase in tariff request application, rate impact by customer class, and the utility's justification for the request.</li> </ul> </li> <li>○ Applications for tariff setting/changes along with relevant documentation, including supporting and opposing opinions, should be made available for public inspection.</li> </ul> <ul style="list-style-type: none"> <li>• Educate consumers about the regulatory decision-making process and utilities' tariff applications <ul style="list-style-type: none"> <li>○ Consider setting up an Office of the Consumer Advocate, which should have representatives present at all consumer comment hearings to assist in answering questions</li> <li>○ Before the start of a hearing, regulatory staff should be present to 1) mentor consumers on the rules of etiquette when presenting comments in a public setting, 2) prepare and distribute information pamphlets and answer frequently asked questions about the rate case process and the utility's request, 3) provide fact sheets and answer questions about the pending application from elected officials, consumers, or members of the media, and 4) answer general utility questions related to service quality, billing errors, or the customer complaint process</li> </ul> </li> <li>• Ensure the consistency of regulatory communications "in one voice" to the public <ul style="list-style-type: none"> <li>○ Appoint a professional staff member designated as the Director of Communications or Public Relations as the only person authorized to communicate with the public and media on behalf of the regulator</li> <li>○ Develop communications policies and procedures outlining:<sup>38</sup> <ul style="list-style-type: none"> <li>• Who can speak to whom, and under what circumstances</li> <li>• Who can speak for the agency (specifically to the news media)</li> </ul> </li> </ul> </li> </ul>
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<sup>38</sup> Melnykovich, Andrew. "Building Confidence in the Regulator through Effective Communications, Policies, and Procedures." Presentation at a NARUC webinar, November 16, 2021.

	<ul style="list-style-type: none"> <li>• Who to check with before saying anything</li> <li>• When to get lawyers get involved</li> <li>○ Develop policies or procedures for the internal handling of:<sup>39</sup> <ul style="list-style-type: none"> <li>• Media inquiries</li> <li>• Public inquiries</li> <li>• Formal requests for agency documents</li> <li>• Ex parte communications</li> <li>• Inquiries from stakeholders on non-case matters</li> <li>• Inquiries from case participants regarding case-related matters</li> <li>• Inquiries from legislators/governor's office</li> <li>• Inquiries from other government agencies</li> </ul> </li> <li>○ Define parameters/framework for inquiries and responses:<sup>40</sup> <ul style="list-style-type: none"> <li>• When to require written questions</li> <li>• When an immediate response is permitted</li> <li>• Which responses require vetting</li> <li>• Which questions may not be answered (i.e., due to legal constraints, privacy concerns, etc.)</li> <li>• Timeliness of response</li> </ul> </li> </ul>
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### **Suggested Actions to be Undertaken and Reported at the Next OPERA Annual Meeting**

1. Undertake needs assessments to identify the potential for developing a new or upgrading an existing communications strategy for the respective regulator, in consideration of the good practice elements of a communication strategy outlined in the above recommendation tables.
2. Outline time-bound action plans for implementing any new elements of a communications strategy, or an entirely new communication strategy along with any TA needs for implementation.
3. Prepare presentations on items 1 and 2 above. Deliver the presentations at the next OPERA Annual Meeting.
4. In case a regulator is of the opinion that the existing communications strategy adequately meets its needs, it would be helpful to make a presentation about the key elements of the existing communications strategy, the way it has been applied, and the outcomes/achievements of the application of the strategy.

<sup>39</sup> Ibid.

<sup>40</sup> Ibid.

## **Institutional Soundness – Organizational Structure, Staffing, and Capacity Building**

### **Organizational Structure**

The internal organizational structure of the regulatory entities participating in the survey includes a broad range of variations: regulators with structures covering key regulatory functions, others with narrower regulatory coverage, and others with regulatory functions spread among various agencies. In countries without regulators, utilities perform key regulatory functions.

- Regulators in PNG, Fiji, and Vanuatu have units covering the following areas:
  - Fiji – tariffs, licensing, and technical standards and quality
  - Vanuatu – economics and tariffs, finance, legal, and engineering, and customer care
  - PNG – technical and economic regulation and community outreach
- Tonga’s regulator has a Financial Controller/Regulatory Auditor and Technical Manager
- Samoa’s regulator has five main divisions which cover regulatory functions; economics and tariffs; finance; legal; technical regulation; and consumer affairs
- Palau’s regulator has three staff at present led by a director
- In the Cook Islands, regulatory functions are spread across various agencies, including an Office of the Energy Commissioner, electricity utilities, local administrations on outer islands, and various other government agencies.
- Similarly, in Niue, key regulatory functions related to legal, technical matters, and tariff setting have been spread across several agencies, including the Crown Law Office; the Ministry of Infrastructure – Communications, Utilities, and Transport; the Treasury, and the Bulk Fuel Department.
- The Solomon Islands’ utility has a full-fledged typical utility structure with all key functional units, covering key regulatory functions related to tariff setting, licensing (technical aspects), technical regulation/QoS, and consumer protection.
- Nauru and Tuvalu’s utilities have departments/staff involved in tariff setting and technical standards enforcement.<sup>41</sup>

### **Staffing and Capacity Building**

The staffing of regulators in PICs is modest, varying between four staff in Palau to 10 staff in Fiji and 17 in Vanuatu. This reflects the relatively small size of the countries’ economies, populations, and electricity sectors, respectively. PNG’s regulator is an exception with 86 staff, as it is the largest country in terms of area, population, and economy. Some of the regulators have staff with educational and professional backgrounds in key relevant academic disciplines, supporting key regulatory activities undertaken through the utilities such as finance, accounting, IT, and engineering.

Other regulators are still recruiting staff to meet their needs fully. Master’s degrees in key regulatory academic disciplines (i.e., engineering, finance, economics) can be obtained in Australia, New Zealand, and Fiji. Academic institutions in the remaining PICs offer studies only at certificate and diploma levels. The in-house capacity of the regulators in the PICs is limited, and they rely primarily on consultants’ assistance with donor funding to advance regulatory work.

- Regulators in Fiji, Samoa, Tonga, and Vanuatu have staff with background in key regulatory topics related to economics (i.e., Samoa, Fiji, Vanuatu), finance/accounting, engineering, and legal (i.e., Samoa, Fiji, Vanuatu).
- Palau has a director with previous experience as a regulator and utilities board member/policy maker.

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<sup>41</sup> Nauru and Tuvalu have not made an explicit statement about this arrangement. Therefore, it has been formulated as the author’s estimate.

- Vanuatu has in-house capacity for tariff reviews and technical assessments of the electricity sector. The Solomon Islands' utility has in-house capacity in licensing electricity technicians.
- PNG's regulator is currently staffed at 25% and the recruitment of more staff is underway.
- The Office of the Energy Commissioner in the Cook Islands is also not yet fully staffed according to needs.
- Niue's qualified regulatory staff is spread across various agencies reflecting the overall scarcity of human resources related to the small number of the country's total population of 1,654<sup>42</sup> and land area of 260 sq. km (100 sq. miles)<sup>43</sup>
- Academic programs in areas of energy regulation are available in Fiji and Tonga
  - Electrical and electronics engineering, Masters in Renewable Energy in national universities in Fiji, New Zealand, and Australia
  - A certificate in electrical engineering/electricity trade is offered respectively by a local technical school in Tonga and the Solomon Islands National University
- Ministry staff supports the Fijian regulator through secondments
- Development partners – ADB, the World Bank, the Australian government, and the United States Agency for International Development (USAID) provide training and technical aid to regulators in the region through consultants.

### Key Recommendations for Improvement

The table below outlines recommendations for improvement in the key areas under consideration in this section – organizational structure, staffing, and capacity building. The recommendations are related to the key findings in the key thematic areas of the survey, discussed in this section, and are based on relevant international good practices. These recommendations are intended to serve as a basis for designing customized action plans for regulatory improvements in individual countries and across groups of countries with common regulatory challenges.

**Table 5: General Strategic Recommendations: Organizational Structure, Staffing, and Capacity Building**

General Strategic Recommendations for Possible Improvements <sup>44</sup>
<ul style="list-style-type: none"> <li>• Carry out an assessment (with in-house effort or outside assistance) of the organizational structure of the regulators in terms of units and departments to validate the adequacy of the current organizational structure covering the key functions of the regulator related to tariff setting, licensing, ensuring QoS, consumer protections, and stakeholder communications. If necessary, recommend improvements to the organizational structure.</li> <li>• Upon completion of the organizational assessment, carry out an assessment of the current staffing and future staffing needs in terms of number of experts, skills mix, and capacity building needs to staff the units and departments within the validated organizational structure of the regulator.</li> <li>• Ensure salary and benefits packages for regulatory staff are comparable with or superior to salaries and benefits offered by utilities and other entities in the regulated industry to prevent a drain of qualified staff to other entities with better pay and benefits           <ul style="list-style-type: none"> <li>○ Regulators should look for opportunities to broaden sources of income and ensure autonomy over the control of their resources to provide for the competitive remuneration of regulatory staff.<sup>45</sup></li> </ul> </li> </ul>

<sup>42</sup> "Niue Population." Worldometer. <https://www.worldometers.info/world-population/niue-population/>

<sup>43</sup> "Niue." Britannica. <https://www.britannica.com/place/Niue>

<sup>44</sup> In countries without formal regulators, such as Nauru, Tuvalu, and the Solomon Islands, the survey covered the utilities that carry out regulatory functions. Recommendations are prioritized in the order they appear.

<sup>45</sup> "Electricity Regulatory Index for Africa 2020." African Development Bank, p. 57

- Undertake measures to gradually ensure in the long-term self-sustained in-house capacity of regulators to carry out their functions, while reducing dependence on outside assistance
  - Develop new and validate any existing specialized training programs for regulatory staff to match any newly identified needs for skills and related capacity building, including peer-to-peer learning through twinning and mentoring programs.
  - Implement such training programs with donor support and in collaboration with the regional regulatory associations and bodies
- Translate technical/academic training into long-term institutional capacity to cope with risk and shock
  - Develop partnership and internship programs in coordination with relevant academic institutions to design and promote academic programs in fields applicable to regulatory activities (i.e., economics, finance, accounting, law, engineering, and environmental studies)
  - Carry out the capacity building activities identified in Table 7 as consolidated common training needs for all surveyed countries below and capacity building priorities for individual countries, identified in Annex 5

### **Suggested Actions to be Undertaken and Reported at the Next OPERA Annual Meeting**

1. Each of the OPERA member countries should undertake an assessment (with in-house effort or outside assistance) of the organizational structure of the regulators in terms of units and departments to validate the adequacy of the current organizational structure. It should cover the key functions of the regulator related to tariff setting, licensing, ensuring QoS, consumer protections, and stakeholder communications. If necessary, they should recommend improvements in the organizational structure and an action plan to implement the identified potential improvements.
2. Each of the OPERA member countries should make a presentation about the findings of their organizational structure self-assessments along with a related action plan for implementing potential improvements, if applicable.
3. OPERA should organize a regional workshop on the first five priority common training needs identified by the surveyed OPERA members in Table 7 covering the following priority topics:
  - Legal powers of the regulator (including regulatory independence)
  - Tariff setting, including longer-term tariff regimens and approaches to absorbing the shock-driven adjustments into tariffs that are not passed on to customers
  - Regulatory accounting and reporting
  - Function and objectives of the regulator
  - Economic evaluation of power generation and transmission projects, including contingency planning for recovering from emergency situations
4. In addition to the regional workshop, OPERA should organize customized training workshops to cover additional training priorities that are not common priorities for all OPERA countries, outlined in Table 7, but remain within the first three priority training needs identified by individual OPERA member countries in Annex 5, as follows:

**Table 6: Priority Training Areas by Country**

<b>Country:</b>	<b>Priority training areas</b>
Vanuatu	Infrastructure reliability and service quality DG Cybersecurity
Tonga, Cook Islands <sup>46</sup>	PPAs
Palau, Fiji	Basic knowledge in the electricity grid's operations
Solomon Islands	Basic economics of operating the power grid
Tuvalu	Basic knowledge in the electricity grid's operations Strategic planning of the power grid
Samoa, PNG	Cost of service studies <sup>47</sup>

Training on topics of interest for more than one country could be delivered at a joint workshop with the participation of all 2-3 countries interested in the given topic. This approach will enable the countries to receive training related to their specific needs without having to wait for these topics to be included at a later stage during a regional workshop in the following years. After the delivery of the first round of proposed (for all OPERA countries) regional and customized (for individual and smaller groups of countries) workshops, the training needs of the OPERA countries may be further updated and re-grouped for delivery purposes as needed.

5. The OPERA leadership should organize the presentation of the outcomes and key takeaways from the proposed regional and customized workshops at the next OPERA Annual Meeting.

<sup>46</sup> PPAs have been ranked as a priority No. 3 in the Cook Islands' priority training list in Annex 5. The preceding priorities No.1 about the function and objectives of the regulator and priority No.2 about legal powers of the regulator have been included as common training priorities for all OPERA countries in the proposed regional training workshop.

<sup>47</sup> In the table about Samoa's priority training needs in Annex 5, the priority training needs No.1 about tariff setting and No. 2 about regulatory accounting and reporting are also common topics of interest for the other OPERA countries and have therefore been included in a common regional training workshop for all countries. Subsequently, the next priority training No. 3 about cost of service studies for Samoa has been proposed to be delivered as an individual customized training for the Samoan regulator. In a similar way, cost of service studies have been proposed to be delivered as an individual customized training to PNG jointly with Samoa. The preceding training priorities No. 1 and No. 2 also form part of the common training priorities for all OPERA countries and are proposed to be addressed at a regional workshop.



## **Institutional Soundness – Capacity to Enforce Technical Regulations (QoS)**

### **Capacity to Enforce Technical Regulations**

Australian and New Zealand technical standards apply in the electricity sectors in the survey countries. Utilities and regulators have relevant staff to ensure application of these standards. Surveyed regulators are involved in:

- Technical regulations (i.e., Tonga)
- Ensuring compliance with QoS standards (i.e., Vanuatu, Samoa, Tonga)
- Joint technical inspections with the utility (i.e., Fiji)

While penalties for non-compliance exist in most countries, there are also the examples of Samoa and Nauru, where penalties are rarely applied. In addition, in the Solomon Islands, penalties established by the 1969 Electricity Act have not been updated and have become negligible in today's prices. Regulators and utilities have dedicated units and staff for compliance monitoring and enforcement of standards and QoS.

- Fiji's regulator has an Inspector for Technical Regulations who monitors generation sites and grants technical clearance for licenses.
- Samoa's regulator has an Electricity Technical Officer with a team to enforce standards and QoS.
- Tonga's regulator has technical staff to enforce technical regulations and clear concessions.
- Vanuatu's regulator issues and monitors technical regulations in compliance with its mandate by law.
- The utility staff in Nauru and Tuvalu oversee technical compliance with standards and QoS requirements.
- In the Solomon Islands, the utility Regulating Department enforces technical regulations through its engineering staff.
- In the Cook Islands, technical standards are enforced respectively by the two utilities and the islands' local administrations in their respective service areas.
- In Niue, all technical matters and policies are managed by the Heads of Department at the Ministry of Infrastructure – Communications, Utilities, and Transport.
- In PNG, the regulator will have the capacity to enforce technical regulations and all other decisions/rulings through authorized officers who are being hired.

### **Current Strengths and Key Recommendations for Improvement**

The table below outlines current strengths and recommendations for improvement in the key areas under consideration in this section. The recommendations are related to the key findings in the key thematic areas of the survey, discussed in this section, and are based on relevant international good practices. These recommendations are intended to serve as a basis for designing customized action plans for regulatory improvements in individual countries and across groups of countries with common regulatory challenges.

**Table 7: Identified Strengths and General Strategic Recommendations: Capacity to Enforce Technical Regulations (QoS)**

Identified Strengths among Surveyed Regulators and Utilities <sup>48</sup>	General Strategic Recommendations for Possible Improvements <sup>49</sup>
<ul style="list-style-type: none"> <li>• Good examples of arrangements to ensure adequate application of standards and QoS</li> </ul>	<ul style="list-style-type: none"> <li>• The regulators should undertake steps to develop QoS regulations in countries where such regulations may not have been yet developed.</li> <li>• QoS regulation should cover all aspects of reliability indices, including System Average Interruption Frequency Index (SAIFI), System Average Interruption Duration Index (SAIDI), and Customer Average Interruption Index (CAIDI) with properly established ceilings/thresholds. This should also include implementable incentives and penalties. <ul style="list-style-type: none"> <li>○ Penalties or fines should be used to incentivize good service but not as a source of revenue or at levels that might suppress performance.</li> </ul> </li> <li>• The regulator should agree with the utility on a roll-out plan with graduated milestones for attaining the required reliability standards in countries where the distribution network is weak and hampers the achievement of QoS standards. <ul style="list-style-type: none"> <li>○ Enhance linkages between application of standards of equipment and wiring as a basis for ensuring adequate QoS and applying performance-based regulation</li> </ul> </li> <li>• Carry out a customer satisfaction survey to assess the QoS on the customers' side as a basis for corrective measures towards improving QoS as needed</li> </ul>

**Suggested Actions to be Undertaken and Reported at the Next OPERA Annual Meeting**

1. Each of the OPERA member countries should undertake an assessment (with in-house effort or with outside assistance) of the status of QoS regulation in their respective countries in consideration of the recommendations in the above table and prepare Action plans for achieving possible improvements that may be identified during the assessments.
2. Each of the OPERA member countries' regulators should make a presentation about the findings of the QoS assessment and related actions plans for possible improvements, as applicable.

**Capacity Building/Training Needs**

Identifying capacity building/training needs was a key element of the survey. In this regard, participating countries were asked to rank a broad range of regulatory topics by the priority of their interest. A score of 10 was suggested for topics of highest priority, going down to a score of 1 for topics of lowest

<sup>48</sup> In countries without formal regulators, such as Nauru, Tuvalu, and the Solomon Islands, the survey covered the utilities that carry out regulatory functions.

<sup>49</sup> Recommendations are prioritized in the order they appear.

priority for a given country. The ranking was applied at the sole discretion of representatives from individual regulators in consideration of their specific training needs and related priorities. Below is the ranking of the top ten topics of interest based on the cumulative scores assigned by individual countries participating in the survey.

**Table 8: Consolidated Common Training Needs for all Surveyed Countries**

N o.	Training Needs
1	Legal powers of the regulator
2	Tariff setting, including <i>longer-term tariff regimens and approaches to absorbing exogenous shock-driven adjustments<sup>50</sup> into tariffs that are not passed onto customers<sup>51</sup></i>
3	Regulatory accounting and reporting
4	Function and objectives of the regulator
5	Economic evaluation of power generation and transmission projects, including <i>contingency planning for recovery from emergency situations<sup>52</sup></i>
6	Infrastructure reliability and service quality
	Service quality, metering, and customer service
	Grid code
	Licensing of generation (including RE) and distribution facilities
	Demand response/demand side management
	DG
	Resilience, disaster preparedness, and mutual assistance, including <i>contingency planning for recovery from emergency situations<sup>53</sup></i>
	Cybersecurity
7	Cost of service studies
8	PPAs
9	Basic economics of operating the power grid
10	Technical standards

A detailed list of priority training topics of interest to individual countries is presented in Annex 5. These priority training topics may serve as a basis for designing capacity building programs for individual countries. The attached summary list with cumulative priority ranking by all survey countries can be used for designing regional capacity building programs.

<sup>50</sup> Exogenous economic shocks in the current international development context would be related to global oil price fluctuations and other factors such as health security.

<sup>51</sup> Text in italics has been additionally suggested by ADB staff.

<sup>52</sup> Ibid.

<sup>53</sup> Ibid.

## Ensuring Sustainable Power Supply

### Tariff Setting

#### Key Findings

The approach to tariff setting in the survey countries varies in terms of:

- Applying fuel and non-fuel components of tariffs
- Defining revenue requirements to recover cost of service in varying degrees of cost-allocation along the power supply chain
- Combining a cost of service approach with setting up multi-year tariffs, price caps, and performance-based tariffs with varying periods between tariff reviews
- Using proprietary tariff models by individual utilities

#### Use of Automatic Fuel Adjustment Clause

Various countries with dependence on imported diesel fuel have non-fuel and fuel tariff components (i.e., Tonga, Tuvalu, PNG, the Solomon Islands, and the Cook Islands). The non-fuel component is usually set for a longer period (from one to five years), with periodic adjustments for inflation and exchange rate, while the fuel components are adjusted monthly or quarterly.

#### Estimation of Revenue Requirement

Most of the surveyed countries apply a cost of service/revenue requirements approach to tariff setting (i.e., Nauru, Palau, and Samoa) along with some variations related to:

- Using the building blocks method and the cash-needs method to define revenue requirements
- Cost allocation

#### *Use of building blocks and cash-needs approaches to estimate revenue requirements*

- PNG, Tonga (for the non-fuel tariff component), and Fiji use the building blocks method to define revenue requirements.
- Palau uses a cash-needs approach to define revenue requirements.

#### Cost allocation

- When defining revenue requirements, the Solomon Islands allocates costs only by function (i.e., generation, transmission, and distribution) without further allocation of costs by demand, energy, and customer-related costs, and further allocation to consumer categories.
- Vanuatu and Niue differentiate tariffs by bands of increasing consumption instead of allocating costs by functions (i.e., generation, transmission, and distribution) and consumer categories.
- Tonga does not apply cost allocation to consumer categories in tariff design.

#### Cost of Service Studies

Cost of service studies are carried out, including the above-mentioned varying degrees of cost-allocation, by Fiji, Palau, Samoa, Vanuatu, and the Solomon Islands. Carrying out cost of service studies and implementing the findings of such studies is of critical importance to attaining cost-reflective tariffs.

#### Time Periods Between Tariff Reviews

Tariffs are usually set for periods varying from one to five years:<sup>54</sup> one year (i.e., Palau and PNG), three years (i.e., Samoa), four years (i.e., Fiji), and five years (i.e., Tonga and the Solomon Islands). The last tariff reviews without specifically set time periods have been carried out in 2009 (i.e., Niue), 2017 (i.e., Nauru,) and 2020 (i.e., Vanuatu).

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<sup>54</sup> Tariff setting periods in terms of years apply only to non-fuel tariff components in cases when the tariff contains both fuel and non-fuel components. Fuel components are adjusted much more frequently – monthly and quarterly in most cases.

### **Performance-based Tariffs**

Vanuatu and Tonga apply performance indicators in tariff setting. Vanuatu applies performance targets for the frequency and duration of unplanned outages. Tonga applies indicators related to:

- Fuel efficiency
- Fuel loss target
- RE loss target based on actual spill/battery losses/year
- Time of response to customer claims
- Adequate voltage level

### **Cost of Service/Revenue Requirements Approach<sup>55</sup>**

The cost of service/revenue requirements approach is further extended for:

- A tariff period from one to several years as a multi-year tariff and/or price cap with varying intermediate reviews and adjustments
- A one-year price cap with quarterly adjustments for fuel prices is applied in PNG.
- Multi-year tariff with a price cap (i.e., Fiji, Tonga)
- A multi-year tariff with a price cap is further combined with performance indicators (i.e., Vanuatu, Tonga).
- Tuvalu uses a differentiated tariff model with a base tariff and fuel tariff components.
- In the Solomon Islands, the two utilities (TAU and TMUA), as well the local administration of the outer islands (Pa Enua), use a different Excel model to calculate tariffs for the respective territories they serve.

### **Tariff Levels and Subsidies**

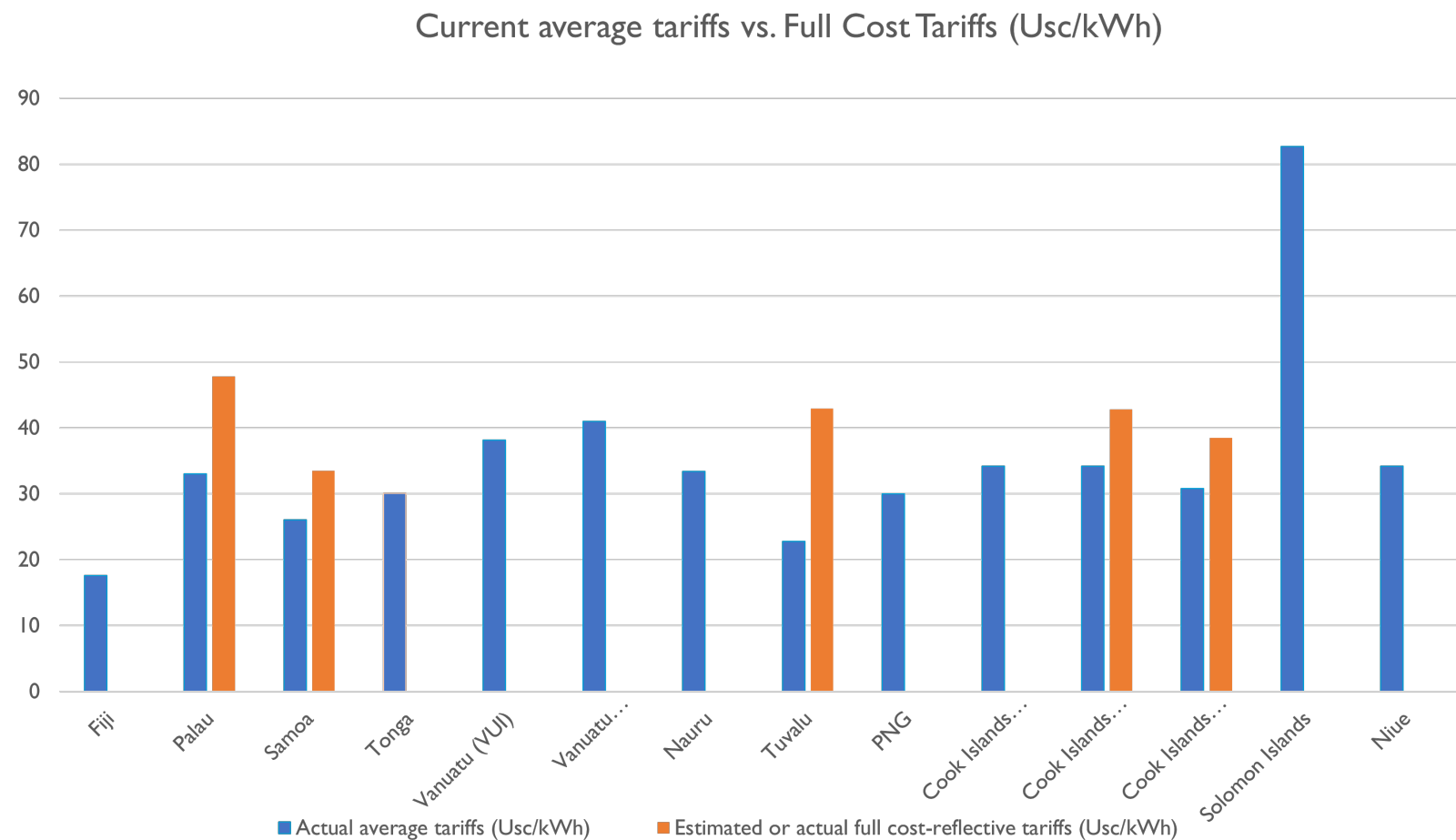
In most of the survey countries, electricity tariffs have remained below costs and subsidies have been put in place to complement gaps to cost recovery. Other countries have maintained tariffs at cost recovery level through regular tariff adjustments for fuel and economic factors such as exchange rate and inflation. On the other hand, the abandonment of regular tariff adjustments along with the government's conscientious effort to keep tariffs low have led to tariffs that are below cost recovery levels. There are cases where electricity tariffs have not been adjusted for more than 10 years.

See the figure below for reference along with Annex 2 for further details on tariffs and subsidies.

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<sup>55</sup> See additional information on tariff setting in Annex 2.

Figure 3: Average tariffs vs. full cost tariffs in surveyed PICs



Source: Survey country data

### Figure 3 Legend

#### Fiji

- N/A

#### Palau

- **Full cost recovering tariff at low fuel prices**
- **Full cost recovering tariff at high fuel prices**

#### Samoa

- **Actual tariff is temporarily kept by government at 77% of full cost-reflective tariff, without fuel adjustments since Nov. 2021**
- **Full cost-reflective tariff at high fuel prices, approved by the regulator**

#### Tonga

- **Actual full cost-reflective tariff**

#### Vanuatu (VUI)

- **Actual tariff below full cost of supply**

#### Vanuatu (UNELCO)

- **Below cost**

#### Nauru

- **Actual tariff below full cost of supply**

#### Tuvalu

- **Estimated full cost-reflective tariff**

#### PNG

- **Actual full cost-reflective tariff**

#### Cook Islands (Raratonga Island)

- **Actual full cost-reflective tariff of TAU utility**

#### Cook Islands (Aitutaki Island and Southern Outer Islands)

- **Actual tariff at 80% of the full cost-reflective tariff of TMU utility serving the South Islands**
- **Estimated full cost-reflective tariff of TMU utility serving the South Islands**

#### Cook Islands (Northern Outer Islands)

- **Actual tariff at 80% of the full cost-reflective tariff at Pa Enua – Northern Islands**
- **Estimated full cost-reflective tariff at Pa Enua – Northern Islands**

#### Solomon Islands

- **Actual full cost-reflective tariff**

#### Niue

- **Actual tariff below full cost of supply. Tariffs have not been adjusted since 2009.**

Highlights of approaches to tariffs setting in individual countries are outlined below.

### **Cost-recovery Level of Tariffs**

- Palau, Tonga, PNG, and the Solomon Islands maintain cost-reflective tariffs through:
  - Adequate and timely tariff adjustments for changes in fuel prices and economic factors (e.g., inflation, exchange rate) combined with cross-subsidies and direct government subsidies to support vulnerable consumers (i.e., Palau, Tonga, and PNG).<sup>56</sup>
- Tariffs without fuel price adjustments slip below cost recovery level (i.e., Nauru, Tuvalu, Samoa, Niue, and the Cook Islands). In Samoa, current tariffs recover 77% of the full cost of electricity supply.<sup>57</sup> In Tuvalu, tariffs recover 53%, and in the Cook Islands (the South Islands) they recover 80%. Tariffs in Niue have not been adjusted for the last 13 years (since 2009).<sup>58</sup>
- Similarly, limited regulatory audit capacity and inadequate utility reporting to the regulator affect cost-recovery in Vanuatu.<sup>59</sup>
- Tariffs in Nauru and Tuvalu recover primarily operations and maintenance (O&M) cost, while donors provide capital expenditures (CAPEX). However, currently tariffs in these two countries remain below cost-recovery level.<sup>60</sup>

### **Subsidies and Their Sources and Targeting**

- Palau and Tonga apply targeted budget subsidies to support lifeline tariffs for low-income consumers.
- A budget subsidy for an initial defined amount of electricity consumption is applied to all consumers in Nauru, Niue, the Cook Islands, and Vanuatu.<sup>61</sup>
- Cross-subsidies from electricity to water tariffs constrain the performance of the electricity utility in Palau. Cross-subsidies among electricity consumer categories are further applied in Palau, Vanuatu, and Nauru.

### **Loss Recovery Thresholds**

Imposing thresholds to loss recovery through tariff formulas creates an incentive for utilities to reduce losses beyond such thresholds to prevent covering for such losses at their expense. Palau, Samoa, Tonga, and Vanuatu provide good examples of using such thresholds in their tariff setting. However, allowing too high a level of losses to be recovered through tariffs would lead to higher tariffs.

For example, a significantly high level of losses is allowed for recovery through tariffs in the Solomon Islands (i.e., 23%), coupled with a very high dependence on imported diesel fuel (which makes up 92% of the country's installed power generation capacity), has resulted in one of the highest electricity tariffs globally at 82USc/kWh.

### **Regulatory Reporting and Audit**

While surveyed, regulators in varying degrees:

- Receive reporting information from the regulated utilities
- Audit such information
- Monitor the utilities' performance

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<sup>56</sup> See Figure 3 above.

<sup>57</sup> Samoa's tariffs should be adjusted monthly for fuel and IPP costs. However, with the new government 20% reduction since November 2021, there have not been anymore adjustments. Nevertheless, the structure and tariff design must ensure cost-reflective tariffs. The tariff reduction below cost recovery level is just a current issue related government/political interference (Source: Samoa's regulator).

<sup>58</sup> See Figure 3 above.

<sup>59</sup> Ibid.

<sup>60</sup> Ibid.

<sup>61</sup> Government subsidies are provided to electricity consumers on a case-by-case basis at the regulator's request.



Only Vanuatu's regulator plans to develop and establish a Uniform System of Accounts (USoA) as a part of its strategic objectives to be achieved within the next five years. Adopting specialized regulatory accounting and reporting system is a critical prerequisite for:

- Ensuring adequate reporting and defining the costs of service of electricity supply as a basis for:
  - Designing cost-reflective tariffs by consumer categories
  - Monitoring utility performance
  - Developing specialized regulatory audit capabilities, which enable the regulator to validate the relevance of the reported costs to the provision of the electricity supply service

See the below text about the importance of a regulatory system of accounts.

### **The Importance of Regulatory Accounting<sup>62</sup>**

The effective regulation of utilities is all about getting the numbers right. All the crucial utility functions – providing reliable service safely and at economically efficient rates – depend upon the ability of the utility to obtain revenues, through regulated rates, which are sufficient – but not excessive – to build, operate, and maintain the utility's services. The regulator's role is to ensure that the utility's rates satisfy this need while protecting the utility's customers from waste, inefficiency, and corrupt behavior.

The utility regulator cannot perform this essential role without accurate, timely, verifiable, granular, and comprehensive accounting data from the utility. Data of this quality are best collected using a well understood, and time-tested, accounting system. For regulators, the USoA, used by all United States electric utilities and adopted by many utilities in other parts of the world, provides an ideal platform. For a regulated utility, the regulatory accounting system is the core from which the information entered into all other systems can be drawn. All the basic information (drawn from invoices and receipts and other source documents) is recorded and categorized in the regulatory accounting system; from there it can be summarized and adjusted, if necessary (for example for differences in depreciation treatment), for entries into reports for the tax authorities or investors.

Effective price regulation is designed to answer two questions: How much revenue should the utility collect from customers, and how should that revenue "requirement" be allocated among customer groups. Neither of those questions can be answered accurately, however, unless both the utility – which has the task of proposing a level of revenues and a rate design to recover those revenues – and the regulator – which has the responsibility to ensure that the utility recovers just enough to cover its costs and earn a reasonable profit – have a shared, accurate and detailed record and understanding of the utility's finances. The granular details available in a good system of accounts are particularly valuable when determining what costs are associated with which customers; aligning costs with rates enhances fairness (both actual and perceived) as well as economic efficiency.

The use of a coherent system of accounts will further provide the regulator with an important tool when it evaluates the performance of the utility in at least two important respects. First, is the utility investing at appropriate levels relative to maintenance and repair? Utilities have an incentive to overinvest in capital and underspend (relatively) for maintenance, because they earn a return on capital investment but not on expenses. Accurate charts of accounts, and clear instructions for those accounts, can help ensure that capital and expense spending are properly characterized.

Second, how does the utility's investment, expense and revenue collection performance compare with that of similar utilities? Where several utilities in the same jurisdiction or region use the same accounting system, comparison between and among them allows the regulator to identify, and seek

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<sup>62</sup> The below information is taken from "Regulatory Accounting: A Primer for Utility Regulators." USAID/NARUC. December 2019. pp. 5, 6, 7.

information concerning, “outliers” in the data, and thus help ensure that, to the extent possible, the utility is acting efficiently.

Furthermore, a good accounting system will help both the utility and the regulator to identify areas of excess or inadequate investment by, for example, tracking investment levels against service performance. Such a system will also assist in identifying areas of “informal” economic activity by increasing the transparency of revenues and expenditures and by providing a platform for comprehensive financial audits.

### Current Strengths and Key Recommendations for Improvement

The table below outlines current strength and recommendations for improvement in relation to tariff setting under consideration in this section. The recommendations are related to the key findings of the survey, discussed in this section, and are based on relevant international good practices. These recommendations are intended to serve as a basis for designing customized action plans for regulatory improvements in individual countries and across groups of countries with common regulatory challenges.

**Table 9: Identified Strengths and General Strategic Recommendations: Tariff Setting**

Identified Strengths among Surveyed Regulators and Utilities <sup>63</sup>	General Strategic Recommendations for Possible Improvements <sup>64</sup>
<ul style="list-style-type: none"> <li>• Cost plus/revenue requirements/building blocks tariff methodology applied</li> <li>• Fuel and non-fuel tariff components applied with periodic adjustments</li> <li>• Thresholds for level of losses allowed for recovery through tariffs</li> </ul>	<ul style="list-style-type: none"> <li>• Develop appropriate tariff methodologies outlining procedures and schedules for major and minor tariff reviews, which should be made known to stakeholders. These could include:               <ul style="list-style-type: none"> <li>○ Tariff indexation or automatic tariff adjustment mechanisms</li> <li>• Ensure timely tariff updates for fuel cost, inflation, and other relevant parameters to prevent tariff slippage below costs (for example, Tuvalu’s tariffs have not been adjusted since 2008, and Niue’s tariffs have not been adjusted since 2009).</li> <li>○ A predictable mechanism for allowing or disallowing certain costs that might be considered unreasonable</li> <li>○ Ex-ante procedures and processes for reviewing key regulatory instruments related to tariff setting</li> </ul> </li> <li>• Stipulate cost of service studies at least every five years or more frequently as a mandatory undertaking in consideration of the specific country context as a basis for defining cost-reflective electricity tariffs               <ul style="list-style-type: none"> <li>○ Within the cost of service study, where applicable, expand building blocks related to revenue requirements and cash-needs approaches with the further allocation of costs of electricity to consumer categories as an adequate basis to define tariffs for these consumer categories</li> <li>○ Expand the revenue requirement approach with</li> </ul> </li> </ul>

<sup>63</sup> In countries without formal regulators, such as Nauru, Tuvalu, and Solomon Islands, the survey covered the utilities that carry out regulatory functions.

<sup>64</sup> Recommendations are prioritized in the order they appear.

	<p>incentives/a performance indicators-based approach to enhance cost-saving incentives in utilities, and most notably</p> <ul style="list-style-type: none"> <li>• Establish a level of losses recoverable through tariffs to be below the current level of utility losses. This will create incentives for the utility to reduce losses to the lower level allowed for recovery through tariffs, and thus avoid covering for excessive losses at utility's expense</li> <li>• Factor key cost of service indicators, including SAIFI, SAIDI, and alike into tariffs to incentivize utilities to reinforce their networks to improve service quality and reliability</li> </ul> <ul style="list-style-type: none"> <li>• Adopt specific regulatory accounting, reporting, and auditing systems to ensure adequate accounting and reporting of all regulated service costs of power supply and then validate the relevance/necessity of incurring such costs <ul style="list-style-type: none"> <li>○ The regulator should require financial audits of the utility companies in a form that ensures inefficient costs of utilities are not passed on to consumers.</li> <li>○ One of the functions of cost of service studies should be the development of or updates to such accounts.</li> </ul> </li> <li>• In countries where tariffs are not cost-reflective, the regulator should develop and agree on an implementable transitional roadmap to achieving cost-reflective tariffs with the utility.<sup>65</sup> <ul style="list-style-type: none"> <li>○ This roadmap would be based only on costs that are reasonable/allowed by the regulator to be incurred by the utility.</li> <li>○ The regulator and utility should consider the possibility of designing longer-term tariff mechanisms to absorb natural hazards and exogenous shock-driven adjustments into tariffs that are not passed onto customers who are also recovering from emergency situations<sup>66</sup></li> <li>○ In designing the transitional roadmap, the regulator and utility should be mindful of the implications of steep tariff increases on consumers and the social and political environment. Therefore, regulators could define separate transitional paths at different time frames for different tariff customer classes toward achieving cost-reflective tariffs.</li> <li>• Countries that are yet to undertake cost of service studies should take immediate steps to do so and implement the findings in accordance with the roadmap.</li> </ul> </li> </ul>
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<sup>65</sup> "Electricity Regulatory Index for Africa 2020." African Development Bank, p.55

<sup>66</sup> Exogenous economic shocks in the current international development context would be related to global oil price fluctuations and other factors such as health security.

	<ul style="list-style-type: none"> <li>• Countries with cost of service studies that are over five years old should update them for implementation.</li> <li>• Realign lifeline tariffs and direct subsidies to only cover eligible/low-income consumers. This will increase the efficiency and effectiveness of subsidies for electricity consumption and will reduce the subsidy cost by refocusing them only on those who really need them (low-income consumers, defined according to relevant norms in the country).</li> </ul>
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### **Suggested Actions to be Undertaken and Reported at the Next OPERA Annual Meeting**

1. Each of the OPERA member countries should undertake an assessment (with in-house effort or with outside assistance) of the status of their tariff-setting approaches along the key aspects covered by the recommendations in the above table:
  - Availability of appropriate tariff methodologies outlining procedures and schedules for major and minor tariff reviews
  - Stipulation about undertaking mandatory cost of service studies at least every five years (or more frequently)
  - Potential for improving the definition of revenue requirements through the additional allocation of costs to individual consumer categories
  - Developing a roadmap toward achieving cost-reflective electricity tariffs in countries where electricity tariffs remain below the cost of electricity supply
  - Realigning subsidies to apply only to those who need them (i.e., low-income consumers of electricity)
2. As necessary, outline action plans for achieving potential improvements in tariff setting in the above-mentioned areas, along with any outside TA that may be needed to implement them.
3. Each of the OPERA member countries' regulators should make a presentation about the findings of the proposed assessments regarding developing appropriate tariff methodologies (per the first bullet in the above list) and any action plans that may have resulted regarding undertaking mandatory cost of service studies (per the second bullet in the above list).

## **Licensing**

### **Key Findings**

Licensing arrangements play a key role in attracting private investors in the power sector, thereby facilitating RE development and improving access to electricity. Arrangements to issue licenses include issuance by a regulator, ministry of energy, or utility. Some countries benefit from having:

- A mandatory bidding process for granting a license
- Established criteria for evaluating license applications
- Standard licensing agreement
- Local content requirements

Most of the surveyed regulators have the authority to issue licenses. In Tuvalu, in the absence of a regulator, the utility issues licenses to new entrants in the sector. In Vanuatu, the Department of Energy issues licenses to IPPs operating under concessions – the only available form of licensed activity

in the sector. Some regulators have standard licensing agreements (i.e., Fiji, Samoa, and the Solomon Islands), others do not (i.e., Palau, Tuvalu, and PNG). Standard licensing agreements ensure the consideration of key safety and standards compliance aspects in the host country and increase the transparency of the process, which facilitates engagement with potential investors.

Except for mandatory bidding for concessions in Vanuatu and IPP licenses in PNG, there are no mandatory bidding processes for licenses in the other surveyed countries. In the Solomon Islands, the government is interested in signing more IPPs through the utility (SP). However, the absence of IPP and PPA frameworks and guidelines constrains the assessment of IPP proposals. There are no requirements for tendering IPPs in the country. The utility's chief engineer, chief financial officer, and general manager review unsolicited proposals based on in-house review criteria. The government's Ministry of Mines, Energy, and Rural Electrification has set up a project office to assess IPPs. There are standard licensing agreements to certify the safety of a license. Small IPPs below 50kW do not need a license.

In Niue, all technical matters and policies, including licensing, are looked after by the heads of departments at the Ministry of Infrastructure, Communications, Utilities, and Transport.

In the Cook Islands, a license must be issued for the supply of energy to the public by the minister responsible for energy, assisted by the energy commissioner under the minister in reviewing the license application. PNG provides a good example of stipulating licensing procedures and criteria in a law about the regulator – the National Energy Authority (NEA) Act of 2021 – including the authority for issuing licenses, a mandatory bidding process for granting a license, and local content requirements.

In PNG, licenses are issued mostly to new IPPs. Under the NEA Act of 2021, the regulator's Board recommends that the Minister of Energy issue a license to an electricity undertaker. The regulator is working on preparing standard licensing agreements. The local content requirements in licenses issued in PNG are focused on contributing to the country's economic development in the following way:

- A licensee is obligated to provide community development assistance to people living in the area affected/covered by the licensee's project.
- Licenses for power generation under 10 megawatts (MW) must be reserved for companies of PNG citizens.
- Licenses for power generation over 10 MW must involve PNG companies as joint venture partners in the project.

### **Current Strengths and Key Recommendations for Improvement**

The table below outlines current strengths and recommendations for improvement in relation to licensing under consideration in this section. The recommendations are based on relevant international experience. These recommendations are intended to serve as a basis for designing customized action plans for regulatory improvements as needed in individual countries and across groups of countries with common regulatory challenges.

**Table 10: Identified Strengths and General Strategic Recommendations: Licensing**

Identified Strengths among Surveyed Regulators and Utilities <sup>67</sup>	General Strategic Recommendations for Possible Improvements <sup>68</sup>
<ul style="list-style-type: none"> <li>Most surveyed regulators have the authority to issue licenses. Standard licensing agreements are also available in some cases.</li> </ul>	<ul style="list-style-type: none"> <li>Develop a licensing framework along with related frameworks for IPPs and PPAs, with a particular focus on isolated mini-grids and standalone systems and integrating RE sources, which are prominent in the PICs</li> <li>Consider the use of standard licensing agreements, which may increase the transparency of the process and facilitate engagement with potential investors</li> <li>Consider measures for enforcing the adopted licensing procedures and preventing corrupt practices</li> <li>Local content requirements in licenses contribute to the host country's overall economic and power development</li> </ul>

### **Suggested Actions to be Undertaken and Reported at the Next OPERA Annual Meeting**

#### **I. Each of the OPERA member countries should:**

- Assess (with their own in-house capacity or outside assistance) the need for developing new or updating existing licensing frameworks along with related frameworks for IPPs and PPAs
- Develop action plan(s) or develop new/update existing licensing frameworks along with related frameworks for IPPs and PPAs, if such needs are identified at the assessment stage
- Prepare and deliver presentations on the above items

## **Enhancing Infrastructure Resilience**

### **Key Findings**

Given the strong vulnerability of the PICs to many natural hazards, such as cyclones, earthquakes, tsunamis, and volcanic eruptions, regulatory measures to enhance power infrastructure resilience in these countries are of particular importance. In this context, several regulators in the region provide good examples to consider.

The Fiji regulator allows the following within the utility tariff:<sup>69</sup>

- Relevant return on investments within the weighted average cost of capital

<sup>67</sup> In countries without formal regulators, such as Nauru, Tuvalu, and the Solomon Islands, the survey covered the utilities that carry out regulatory functions.

<sup>68</sup> Recommendations are prioritized from top to bottom.

<sup>69</sup> Formally, on paper, the Fijian regulator allows for a "cyclone recovery charge," but in practice, the regulator has not allowed for this charge to be passed through in recent years (Source: information from consultants).

- The depreciation cost for compensation of power sector infrastructure is included in the Power Sector Development Plan (PDP)

There are stipulations under cost of service regulation in Palau and Samoa to allow capital investments in infrastructure resilience to be recovered through electricity tariffs. In Vanuatu, there are considerations of resilience investments in the preparation and review of the PDPs. Also, force majeure allocation is embedded in the tariff to account for the rehabilitation of the network immediately after a force majeure event. Furthermore, under a different program (outside the regulator's mandate), the Vanuatu government is developing and strengthening its cyber-crime legislation. Factoring investments into Tuvalu's tariff may render it unaffordable. Therefore, Tuvalu's utility has suggested setting up a dedicated account at the National Bank of Tuvalu for capital investments in infrastructure resilience.

The government and donor partners can assist in establishing this account for infrastructure resilience. In the Cook Islands, resilience-enhancing measures are a key requirement in donor-funded projects and are therefore reflected in project documents and relevant country policies. Cybersecurity measures have been discussed with the ICT Department and the National Security Office. The Solomon Island's utility (SP) provides good examples of resilience-oriented activities:

- Allowed recovery of investments related to enabling resilience measures, including operations at G-I and N-I, through tariffs as well as a new budget for additional storage space at mini-grids/outstations for storing additional meters and spare parts, thereby minimizing delays in procuring meters and spare parts<sup>70</sup>
- Storage of additional generation and distribution spares near power stations to easily replace feeders which may be damaged by natural disasters
- Performing reliability assessments by the distribution and generation teams with corresponding cost estimates of resilience enhancing measures by the planning department of the utility
- Cybersecurity has been identified as a key risk area for utility operations. The utility has internally assumed cybersecurity enhancing functions, following up on an earlier contract with an Australian firm.

PNG also provides good examples of resilience-enhancing measures through:

- A reliability fund set up within the utility and funded by utility rebates for unserved demand, reported quarterly to the regulator and allocated to the fund
- A green financing project aimed at enhancing climate resilience, among other things, through the Bank of PNG and PNG's Center for Excellence in Financial Inclusion (CEFI)<sup>71</sup>

### **Current Strengths and Key Recommendations for Improvement**

The table below outlines current strengths and recommendations for improvement in relation to enhancing infrastructure resilience under consideration in this section. The recommendations are based on relevant international experience. These recommendations are intended to serve as a basis for designing customized action plans to enhance infrastructure resilience as needed in individual countries and across groups of countries with common regulatory challenges.

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<sup>70</sup> G-I and N-I refer to scenarios where one generation unit (G-I) and a section of the power network (N-I) cease functioning outside the planned operational parameters of the power system and need prompt backup compensatory measures to ensure continuity and stability of system operations.

<sup>71</sup> CEFI's vision, mission, and values focus on financial inclusion and literacy, poverty elimination, and the promotion of vibrant financial institutional operation in PNG (Source: "About Us." CEFI. <https://www.thecefi.org/about-us/>).

**Table 11: Identified Strengths and General Strategic Recommendations for Improvement: Enhancing Infrastructure Resilience**

Identified Strengths among Surveyed Regulators and Utilities <sup>72</sup>	General Strategic Recommendations for Possible Improvements <sup>73</sup>
<p>Consideration of resilience investments in:</p> <ul style="list-style-type: none"> <li>• PDPs</li> <li>• Tariff design for the recovery of resilience investments</li> </ul> <p>Examples of setting up reliability funds, accounts, and green financing for resilience enhancement</p>	<ul style="list-style-type: none"> <li>• Expand resilience initiatives to more PIC-12 countries based on preliminary assessments of resiliency needs of power infrastructure</li> <li>• Integrate climate change measures into national policies, strategies, and planning, with the goal of strengthening resilience and adaptive capacity to climate-related hazards and natural disasters</li> <li>• Strengthen human and institutional capacity for systems modelling and planning in governments, regulators, and utilities, which will enable them to reduce the impact of climate events on electricity systems at the national level</li> <li>• Include cybersecurity consideration in resilience enhancing measures</li> <li>• Expand the search of innovative financing mechanisms for resilience financing</li> <li>• Expand the use of infrastructure reliability assessments as a basis for resilience enhancements</li> </ul>

### **Suggested Actions to be Undertaken and Reported at the Next OPERA Annual Meeting**

Each of the OPERA member countries should:

1. Assess (with their own in-house capacity or outside assistance) the need for developing new or updating existing plans/programs for enhancing infrastructure resilience in consideration of the above recommendations
2. Develop action plan(s) or develop new/update existing plans/programs for enhancing infrastructure resilience if such needs are identified at the assessment stage
3. Prepare and deliver presentations on the above items

<sup>72</sup> In countries without formal regulators, such as Nauru, Tuvalu, and Solomon Islands, the survey covered the utilities that carry out regulatory functions.

<sup>73</sup> Recommendations are prioritized from top to bottom.



## RE Development and EE Improvements

### Key Findings in RE Development

RE development plays a critical role in reducing the cost of electricity supply by reducing dependence on imported fuel. The surveyed countries have various national policy and strategy documents outlining targets in RE development in consideration of the Sustainable Development Goals 7 (SDG7) indicators. Various regulatory incentives have been applied in individual countries, including:

- Recovery of investments in RE through tariffs
- Feed-in tariffs
- Issuing licenses for RE development
- Developing policies for small grid RE
- Grid code development
- Publication of available transmission and distribution capacity
- Net metering rules

Among the survey countries, PNG is developing specific policies for RE subsectors, and Fiji is pursuing the development of carbon pricing, emissions trading policies, and applying clean cooking incentives. Clean cooking policies/standards in the surveyed countries are managed by other institutions outside the regulators. See the below tables on RE policies, strategies, and programs, and regulatory incentives and additional details in Annex 7.

**Table 12: RE Policies, Strategies, and Programs/Plans in the PICs, Fiji, and PNG**

Country	Policies	Programs/Plans	Strategies	Roadmaps/Pathways
<b>Fiji</b>		20-year Development Plan	Low Emission Development Strategy (LEDS) 2018 – 2050	
<b>Palau</b>	2010 National Energy Policy			
<b>Samoa</b>	Renewable Energy Policy 2022	Energy Sector Plan 2017 – 2022 Samoa Nationally Determined Contribution	Low Emission Strategy 2021 – 2030	Pathway for the Development of Samoa FY 2021/22 – FY 2025/2026
<b>Vanuatu</b>		National Sustainable Development Plan 2016-2030		National Energy Roadmap 2016-2022

		Environment Policy Objective 2.3 to 'promote renewable sources of energy and efficient energy use'		
<b>Nauru</b>				Nauru Energy Roadmap
<b>Tuvalu</b>				
<b>Solomon Islands</b>				Renewable Energy Roadmap of April 2021
<b>Cook Islands</b>				
<b>Niue</b>		Niue National Strategic Plan 2016-2026  Niue NDC		The Niue Strategic Energy Roadmap 2015-2025 (NSERM)
<b>PNG</b>	RE policies are currently being developed			The PNG Vision 2050

Source: Surveyed countries' regulators and utilities (where regulators are not available)

**Table 13: Regulatory Incentives for RE**

Country	Factoring Investments Recovery in Tariffs	Feed-In Tariffs	Grid Codes facilitating RE Integration	Publicly Available Information about Transmission and Distribution Capacity to Facilitate RE Integration	RE Licensing	Small-scale RE Policies	Net Metering	Green Financing	Carbon Financing
<b>Fiji</b>	Yes		Yes		Yes				Yes
<b>Palau</b>							Yes		
<b>Samoa</b>		Yes			Yes	Yes			
<b>Vanuatu</b>			Yes						
<b>Nauru</b>		Yes	Yes						
<b>Tuvalu</b>		Yes	Yes	Yes	Yes				
<b>Solomon Islands</b>									

<b>Cook Islands</b>									
<b>Niue</b>									
<b>PNG</b>								Yes	

Source: Surveyed countries' regulators and utilities (where regulators are not available)<sup>74</sup>

### Key Findings in EE

EE measures play a critical role in reducing greenhouse gas emissions and dependence on imported fuel by reducing energy consumption. The surveyed countries have key national policy and strategy documents outlining EE targets. Key EE policies applied in the surveyed countries include:

- Consideration of potential EE improvements in power sector planning
- Demand side management programs
- Green financing
- Energy audits

Several countries apply minimum energy performance standards (MEPS), and others apply EE financing mechanisms based on revolving funds with donor support and rebate schemes. EE policies and regulations in the surveyed countries are managed by entities outside the energy regulators, such as ministries of energy and departments at the ministries of finance. See the below tables on EE policies, strategies, programs, and regulatory incentives along with additional details in Annex 8.

<sup>74</sup> Empty boxes in the above table indicate that the surveyed countries have not reported relevant regulatory incentives.

Table 14: EE Programs and Legislation in the PICs

Country	Programs/Plans	Roadmaps/Pathways	Laws
<b>Fiji</b>			
<b>Palau</b>			
<b>Samoa</b>			Samoa's Energy Management Act 2020
<b>Vanuatu</b>	Vanuatu's National Sustainable Development Plan 2016-2030  Environment Policy Objective 2.3 to 'promote renewable sources of energy and efficient energy use'		Vanuatu's Energy Efficiency of Electrical Appliances, Equipment and Lighting Products Act No. 24 and No. 26 of 2016 on standards and import bans on energy inefficient products
<b>Nauru</b>		Vanuatu's National Energy Roadmap 2016 – 2030	
<b>Tonga</b>		Tonga Energy Roadmap (TERM) 2010 – 2020, and Tonga Energy Roadmap (TERM PLUS 2020-2035)	Draft Tonga Energy Bill
<b>Tuvalu</b>			Tuvalu's Energy and Building Codes
<b>Solomon Islands</b>			
<b>Cook Islands</b>			
<b>Niue</b>	National Strategic Plan 2016-2026 NDC	Niue Strategic Energy Roadmap 2015-2025 (NSERM)	
<b>PNG</b>			

Source: Surveyed countries' regulators and utilities (where regulators are not available)<sup>75</sup>

<sup>75</sup> Empty boxes in the above table indicate that the surveyed countries have not reported relevant/policy/strategy documents and legislation.

**Table 15: EE Policies and Incentives in the PICs**

Country	Factoring EE in Power Sector Plans	Demand Side Management Programs	Energy Conservation Programs and TV Campaigns	Installation of Pre-Paid Meters	Energy Audits	Tax/Duty Exemptions on Imports of EE Appliances	Minimum Energy Performance Standards	Financing Mechanisms For EE
<b>Fiji</b>	Yes		Yes		Yes		Yes	
<b>Palau</b>								
<b>Samoa</b>	Yes	Yes	Yes	Yes	Yes		Yes	
<b>Vanuatu</b>	Yes	Yes			Yes		Yes	Yes
<b>Nauru</b>					Yes			
<b>Tuvalu</b>	Yes			Yes	Yes		Yes	Yes
<b>Solomon Islands</b>						Yes		
<b>Cook Islands</b>								
<b>Niue</b>								
<b>PNG</b>	Yes							Yes

Source: Surveyed countries' regulators and utilities (where regulators are not available)<sup>76</sup>

<sup>76</sup> Empty boxes in the above table indicate that the surveyed countries have not reported relevant/policies and incentives.

## Current Strengths and Key Recommendations For Improvement

The table below outlines current strengths and recommendations for improvement in relation to RE and EE under consideration in this section. The recommendations are based on relevant international experience. These recommendations are intended to serve as a basis for designing customized action plans for further RE development and EE improvement as needed in individual countries and across groups of countries with common regulatory challenges.

**Table 16: Identified Strengths and General Strategic Recommendations: RE Development and EE Improvements**

Identified Strengths among Surveyed Regulators and Utilities <sup>77</sup>	General Strategic Recommendations for Possible Improvements <sup>78</sup>
<p>RE is reflected in key national strategy documents with targets. Experience in key areas enabling RE include:</p> <ul style="list-style-type: none"> <li>• Tariffs accounting for RE investments, feed-in tariffs</li> <li>• Net metering; grid codes and codes for off-grid sites</li> <li>• Public information about available transmission to serve new RE generation</li> </ul>	<ul style="list-style-type: none"> <li>• Develop or update existing (as needed) RE/EE action plans/roadmaps with timelines, milestones and targets, responsible agencies (which may already exist within the NDCs) and outside assistance that may be needed for implementing them. Actions related to RE and EE would already exist within the countries' NDCs.</li> <li>• Use the full menu of RE/EE policies in individual countries in a consolidated and focused way. <ul style="list-style-type: none"> <li>○ Currently, individual countries apply selected, and more often, single measures, which would have a partial impact in comparison with applying a full menu of RE incentives in a single country.</li> </ul> </li> <li>• Coordinate the work of RE/EE agencies with a power sector planning agency.</li> <li>• Develop national or joint international emissions trading and carbon pricing mechanisms under the Paris Agreement.</li> </ul>
<p>EE is reflected in key national strategy documents with targets and national Minimum Energy Performance Standards and Labeling (MEPSL). Experience in key areas enabling EE include:</p> <ul style="list-style-type: none"> <li>• Consideration of EE in PDP, energy audits</li> <li>• MEPSL, demand side management</li> <li>• Energy fund, credit lines, rebate programs</li> </ul>	

## Suggested Actions to be Undertaken and Reported at the Next OPERA Annual Meeting

Each of the OPERA member countries should:

- I. Assess (with their own in-house capacity or outside assistance) the need for developing new or updating existing action plans/roadmaps for RE development, and (to the extent the

<sup>77</sup> In countries without formal regulators, such as Nauru, Tuvalu, and the Solomon Islands, the survey covered the utilities that carry out regulatory functions.

<sup>78</sup> Recommendations are prioritized from top to bottom.

regulators are involved in EE) EE improvements, in consideration, but not limited to the above recommendations.

2. Assess the need and possibility for expanding the current menu of regulatory incentives and measures supporting RE development and EE improvements in consideration but not limited to the incentives and measures outlined above in the summary tables.
3. Building on Fiji's example, assess possibilities for developing national or joint international emissions trading and carbon pricing mechanisms under the Paris Agreement, which would provide an added stream of revenue from emissions trading for RE projects and therefore enhance incentives for developing RE and EE projects (i.e., with emissions trading potential).
4. Assess possibilities for improving the coordination of the work of RE/EE agencies with a power sector planning agency to maximize the sector-wide beneficial effect of implementing RE and EE measures through PDPs.
5. Assess the need for outside TA to carry out the proposed assessments above.
6. Prepare and deliver presentations on the above items.

## Improving Access to Electricity

### Key Findings

Access to electricity in most of the surveyed countries is 100%, while only three (i.e., Vanuatu, the Solomon Islands, and PNG) have relatively low access – 67%, 73%, and 13%, respectively. In this context, the challenge to the countries with low access is to improve access to electricity for their populations, while the countries with 100% access at present must strive to meet growing demand.

**Table 17: Access to Electricity in Surveyed Countries**

Country	Fiji	Palau	Tonga <sup>79</sup>	Nauru	Niue	Tuvalu	Cook Islands	Samoa	Vanuatu	Solomon Islands	PNG
Population access to electricity (%)	100 <sup>80</sup>	100 <sup>81</sup> 99.9% of the population, 0.01% (off-the-grid private system)	100 <sup>82</sup>	100 <sup>83</sup>	100 <sup>84</sup>	100 <sup>85</sup>	100 <sup>86</sup>	99 <sup>87</sup>	67 <sup>88</sup>	73 <sup>89</sup>	13 <sup>90</sup>

Rural electrification is conducted through various institutions across the surveyed countries, including rural electrification funds, energy departments, utilities, and local administrations. The two countries with relatively low levels of electrification – PNG (13%, access for the population living on PNG's island territory<sup>91</sup> and the Solomon Islands 73%) – have developed national electrification plans. Vanuatu, the next in line with a low level of electrification at 67%, promotes the

<sup>80</sup> Ritchie, Hannah and Max Roser. "Fiji: Energy Country Profile." Our World in Data. <https://ourworldindata.org/energy/country/fiji>

<sup>81</sup> Ritchie, Hannah and Max Roser. "Palau: Energy Country Profile." Our World in Data. <https://ourworldindata.org/energy/country/palau>

<sup>82</sup> Ritchie, Hannah and Max Roser. "Tonga: Energy Country Profile." Our World in Data. <https://ourworldindata.org/energy/country/tonga>

<sup>83</sup> Ritchie, Hannah and Max Roser. "Nauru: Energy Country Profile." Our World in Data. <https://ourworldindata.org/energy/country/nauru>

<sup>84</sup> "Niue Energy Profile." IRENA. August 2022. [https://www.irena.org/-/media/Files/IRENA/Agency/Statistics/Statistical\\_Profiles/Oceania/Niue\\_Oceania\\_RE\\_SP.pdf](https://www.irena.org/-/media/Files/IRENA/Agency/Statistics/Statistical_Profiles/Oceania/Niue_Oceania_RE_SP.pdf)

<sup>85</sup> Ritchie, Hannah and Max Roser. "Tuvalu: Energy Country Profile." Our World in Data. <https://ourworldindata.org/energy/country/tuvalu>

<sup>86</sup> "Energy Profile: Cook Islands." IRENA. [https://www.irena.org/-/media/Files/IRENA/Agency/Statistics/Statistical\\_Profiles/Oceania/Cook%20Islands\\_Oceania\\_RE\\_SP.pdf](https://www.irena.org/-/media/Files/IRENA/Agency/Statistics/Statistical_Profiles/Oceania/Cook%20Islands_Oceania_RE_SP.pdf)

<sup>87</sup> Ritchie, Hannah and Max Roser. "Samoa: Energy Country Profile." Our World in Data. <https://ourworldindata.org/energy/country/samoa>

<sup>88</sup> Ritchie, Hannah and Max Roser. "Vanuatu: Energy Country Profile." Our World in Data. <https://ourworldindata.org/energy/country/vanuatu>

<sup>89</sup> Ritchie, Hannah and Max Roser. "Electricity Access." Our World in Data. <https://ourworldindata.org/grapher/share-of-the-population-with-access-to-electricity?tab=chart&country=SLB>

<sup>90</sup> 13% access is for the islands' population (Source: National Energy Authority of PNG)

<sup>91</sup> PNG's territory comprises of a large portion of mainland and related islands. See Annex 6 on Country Profiles for further details.



incorporation of mini-grid operations and management into existing electricity concessions and the establishment of electricity cooperatives to improve access to electricity in the country.

Various types of legislation define connections procedures and standards in these countries, such as electricity acts, grid codes, and energy bills. In terms of market arrangements, mini-grids can trade power through PPAs with outside suppliers such as IPPs and concessions. Electricity cooperatives and local administrations can manage and operate the mini-grids in their territory. Mini-grid operators can sell surplus areas to main grids under state utilities and concessions through PPAs, which facilitates further mini-grid expansion. Willing buyer-willing seller agreements under off-grid regulations provide for cost recovery. Grid extension is an alternative way of improving access where technically and economically feasible.

On occasion, governments subsidize consumer connections and local authorities operating mini-grids. Utilities use cross-subsidies to compensate for higher costs of electricity supply through mini-grids. Existing net metering arrangements and standards for DG in some countries also facilitate access to electricity supply. Net metering arrangements facilitate DG as another option for improving access to electricity. The approach to tariffs in rural areas varies between utilities applying the same electricity tariffs for grid-connected and off-grid customers and local administrations defining specific tariffs in their jurisdictions.

The rapid rate of urbanization in the Pacific region and the related pressure on increasing electricity demand by residential consumers is one of the fastest rising challenges. The inability of utilities in many cases to cope with rising urbanization results in vulnerabilities/fragilities of not only economic but also potentially socio-political dimensions.<sup>92</sup>

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<sup>92</sup> See Annex 8 for key findings about improving access to electricity in detail.

### Current Strengths and Key Recommendations for Improvement

The table below outlines current strengths and recommendations for improvement in relation to increasing access to electricity and meeting new demand under consideration in this section. The recommendations are based on relevant international experience. These recommendations are intended to serve as a basis for designing customized follow-up actions for further improving access to electricity and meeting new demand, as needed in individual surveyed countries and across groups of surveyed countries with common regulatory challenges.

**Table 18: Identified Strengths and General Strategic Recommendations: Improving Access to Electricity**

Identified Strengths among Surveyed Regulators and Utilities <sup>93</sup>	General Strategic Recommendations for Possible Improvements <sup>94</sup>
<ul style="list-style-type: none"> <li>• Access is at 100% except for Vanuatu (67%), the Solomon Islands (73%) and PNG (13%, island population). Major effort would focus on meeting new demand.</li> <li>• Mini-grid operators and distributed generators can sell power to utilities/concessionaires through PPAs.</li> <li>• Experience with               <ul style="list-style-type: none"> <li>○ Rural electrification fund</li> <li>○ Government subsidies for connecting rural consumers</li> <li>○ Net metering facilitating DG</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Apply good practices of “light-handed regulation” with moderate licensing and reporting requirements to facilitate entry for rural electrification developers</li> <li>• Select service providers competitively through tenders and auctions in rural areas to minimize cost of service</li> <li>• Analyze potential implications for regulators from increasing residential demand caused by increasing urbanization</li> <li>• Expand/improve grid codes and codes for off-grid/mini-grid areas to facilitate new connections</li> <li>• Develop/enhance models for defining off-grid connection costs and tariff mechanisms</li> <li>• Put in place/update as needed regulations for DG/prosumers to expand electrification options</li> </ul>

### Suggested Actions to be Undertaken and Reported at the Next OPERA Annual Meeting

Each of the OPERA member countries should:

- I. Assess (with their own in-house capacity or outside assistance) the possibility of relaxing/alleviating licensing and reporting procedures for rural electrification developers to facilitate entry and attract investments in rural electrification

<sup>93</sup> In countries without formal regulators, such as Nauru, Tuvalu, and Solomon Islands, the survey covered the utilities that carry out regulatory functions.

<sup>94</sup> Recommendations are prioritized from top to bottom.

2. Assess capacity building needs in relation to preparing auctions for RE to facilitate rural electrification
3. Analyze potential implications of increasing residential demand caused by increasing urbanization for regulators and identify potential mitigating measures, as needed
4. Assess the need for developing new or updating existing grid codes to facilitate connections and mini-grid developments
5. Assess the need for assistance in developing/enhancing models for defining off-grid connection costs and tariff mechanisms, as needed
6. Assess the need for assistance in developing/updating regulations/standards for DG as an option for improving access to electricity
7. Prepare and deliver presentations on the outcomes of the suggested assessments in the above items

## Attracting Private Investment

### Key Findings

PPPs and IPPs are important instruments of mobilizing power sector financing. Blending public and private financing in PPPs usually provides lower cost financing in comparison with entirely private IPPs. While most of the surveyed countries envisage the establishment of PPPs through relevant national policies and legislation, only a few energy regulators participate in reviewing or approving technical and tariff aspects of the PPPs in the power sector (see Table 18 below).

The possibility for establishing PPPs is envisaged in the legislation and policy documents in the surveyed countries through the following documents:

- A 2018 PPP Policy in the Cook Islands
- A 2022 PPP Policy in Niue
- A 2022 amendment to the PPP Act in PNG
- The 2007 State-Owned Enterprise (SOE) Act in the Solomon Islands

PPPs in the power sector are allowed by:

- Fiji's Electricity Act 2017
- Vanuatu's Electricity Supply Act, providing specifically for concession agreements
- Samoa's PPP Handbook<sup>95</sup>
- PNG's Electricity Industry Act

Concessions are the most common form of PPPs in the surveyed countries. In this context, Vanuatu's and Tonga's regulators have a broader mandate of monitoring and enforcing concession agreements, including tariff adjustments, while Fiji's regulator covers the technical inspection of PPP candidates. Niue's regulator will provide comments on PPPs for final government approval once the actual PPP policy and legislation are developed with donor assistance and subsequently adopted, following up on the recent government decision to develop such policy and legislation (see Table 18 below).

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<sup>95</sup> "PPP Laws/Concession Laws – Samoa." The World Bank. <https://ppp.worldbank.org/public-private-partnership/library/ppp-laws-concession-laws-samoa>

**Table 19: Availability of PPP legislation in the surveyed countries**

Country	Cook Islands	Fiji	Palau*	PNG	Solomon Islands	Tonga	Samoa	Vanuatu	Nauru	Niue	Tuvalu
<b>PPP legislation Available</b>	Yes <sup>96</sup>	Yes	No	Yes <sup>97</sup>	Yes <sup>98</sup>	No <sup>99</sup>	Yes	Yes	No	Yes <sup>100</sup>	No
<b>Regulator's role in PPPs</b>	No information	Technical inspections of new applicants	If the need arises, a review role will be required	No	N/A	Reviews/ approves concession tariff adjustments	No involvement	Review, monitor, and enforce	N/A	Provides comments for final Cabinet approval	N/A

**PPP Contract Management**

In Fiji:

- PPP contracts are managed by the Utility Energy Fiji Ltd. and government ministries, such as the Department of Energy, Ministry of Economy, and Ministry of Public Enterprise

In Vanuatu:

- The Ministry of Finance and Economic Management is responsible for all tendering processes for new concessions
- All concession contracts are signed off by the Prime Minister and the Minister of Climate Change
- The Minister of Climate Change (Department of Energy – DoE) administers the concessions

<sup>96</sup> PPP Policy of 2018<sup>97</sup> The PPP (Amendment) Act was passed by PNG's Parliament on January 19, 2022 and came into operation on March 4, 2022 by notice in the National Gazette (Source: "ADB Welcomes PPP Legislation for Improving Service Delivery in PNG." The Pacific Private Sector Development Initiative. <https://www.pacificpsdi.org/news-and-insights/new-releases/read/adb-welcomes-ppp-legislation-for-improving-service-delivery-in-png>). The Electricity Industry Act allows PPPs in the power sector.<sup>98</sup> The SOE Act of 2007 created a framework to privatize failed SOEs and encourage public and private collaboration in SOE service delivery (Source: "Public Private Partnerships of Solomon Islands." Commonwealth Governance. <https://www.commonwealthgovernance.org/countries/pacific/solomon-islands/public-private-partnerships/>).<sup>99</sup> Past PPPs were implemented by the Ministry of Finance and relevant line ministries (Source: "Country Profile: Tonga." The World Bank. <https://ppp.worldbank.org/public-private-partnership/country-profile-tonga>)<sup>100</sup> Recently, the Cabinet has approved the PPP strategy to establish the policy and the legislations. It needed funding to hire an external firm to draft them.

In Tonga:

- Past PPPs have been implemented by the Ministry of Finance and relevant line ministries. The current concession is with Tonga's utility.

Most regulators approve PPA tariffs for IPPs (i.e., Palau, Tonga, Samoa, and Vanuatu) while utilities or government agencies approve PPA tariffs in the remaining countries. Niue does not have PPAs (see Table 19 below).

**Table 20: PPA Arrangements in the Surveyed Countries**

Country	Cook Islands	Fiji	PNG	Palau	Solomon Islands	Tonga	Samoa	Vanuatu	Nauru	Niue	Tuvalu
<b>Regulator approves PPA tariffs</b>	No <sup>101</sup>	No <sup>102</sup>	Yes	Yes	N/A <sup>103</sup>	Yes	Yes	Yes	N/A	No PPAs	N/A
<b>PPAs based on competitive tenders for IPPs</b>	Yes	Yes	No <sup>104</sup>	Yes	No, No tenders for IPPs	Yes	Yes	No	N/A	No PPAs	N/A
<b>PPA tariff passed through to end-consumers' tariffs</b>	No	Yes	TBC <sup>105</sup>	Yes	TBC	Yes	Yes	Yes	N/A	No PPAs	N/A

<sup>101</sup> The Investment Corporation Board approves PPA tariffs in the Cook Islands.

<sup>102</sup> The PPA tariff is negotiated between the utility Energy Fiji Ltd. and the IPP, with adjustments for changes in fuel and IPP cost components in annual tariff reviews by the Fijian regulator.

<sup>103</sup> The utility (SP) participates in reviewing PPA price, but the final decision is with the government. There is one PPA between Tina Hydro Power Ltd and SP - IPP Tina Hydro -15MW (Tine River Hydropower Project)

<sup>104</sup> PPAs are contracted by the utility (PPL) under its own commercial arrangements.

<sup>105</sup> Price setting arrangements for PPAs in PNG remain to be developed.

### Current Strengths and Key Recommendations For Improvement

The table below outlines current strengths and recommendations for improvement in relation to attracting private investments under consideration in this section. The recommendations are based on relevant international experience. These recommendations are intended to serve as a basis for designing customized follow-up actions for further improving approaches to attract private investment, as needed, in the individual surveyed countries and across groups of surveyed countries with common regulatory challenges

**Table 21: Identified Strengths and General Strategic Recommendations: Attracting Private Investment**

Identified Strengths among Surveyed Regulators and Utilities <sup>106</sup>	General Strategic Recommendations for Possible Improvements <sup>107</sup>
<ul style="list-style-type: none"> <li>• PPP opportunities are stipulated in national legislation</li> <li>• PPAs are approved by regulators and are based in varying degrees on competitively tendered IPPs</li> </ul>	<ul style="list-style-type: none"> <li>• Assess the need for developing/amending legislation for PPPs, IPPs, and PPAs</li> <li>• Concessional/blending financing on the public side of PPPs can result in lower tariffs for end-consumers. Therefore, it will be useful to consider the availability of lower cost blended financing through PPPs before engaging with IPPs.</li> <li>• Competitive tenders for the selection of IPPs and subsequent PPAs can prevent unsolicited proposals and bring tariffs down.</li> <li>• Before signing a PPA in the capacity of an offtaker, carefully consider arrangements for sharing related risks, particularly risks related to exchange rates, the collection of payments, and unforeseen reduction of demand.</li> <li>• Confirm the availability of adequate demand before signing PPAs to avoid overbooking PPAs against demand, which may be lower than the contracted output from PPAs.</li> <li>• Avoid signing “take or pay” conditions in a PPA, which may lead the offtaker to pay the IPP without consuming power in a scenario of unexpected decline in demand.</li> <li>• Regulators approving PPAs can ensure balancing demand and end-consumers’ affordability considerations within the PPA price setting.</li> </ul>

### Suggested Actions to be Undertaken and Reported at the Next OPERA Annual Meeting

Each of the OPERA member regulators should assess (with their own in-house capacity or outside

<sup>106</sup> In countries without formal regulators, such as Nauru, Tuvalu, and Solomon Islands, the survey covered the utilities that carry out regulatory functions.

<sup>107</sup> Recommendations are prioritized from top to bottom.

assistance):

1. Needs for developing/amending legislation for PPPs, IPPs, and PPAs and any outside assistance that may be needed in this regard
2. Before contracting IPPs, explore first the possibility for attracting concessional financing from bilateral donor agencies, multilateral development banks, and any other sources of concessional financing as an input to blended financing through PPPs to reduce the overall cost of energy projects, in comparison with IPP cost
3. The need for developing/amending any aspect of concession, IPPs, and PPAs, and any outside assistance that may be needed in this regard
4. Prepare and deliver presentations on the above items



## Empowering Women's Participation in Energy Regulation, Policy, and Infrastructure Development

### Key Findings

The share of women employed by the regulators varies between 25% in PNG and 75% in Palau and is higher than the share of women employed in utilities, where the share varies between 5% in Vanuatu and 26% in Tonga (see relevant tables below).

**Table 22: Women Employed by Regulators**

	Cook Islands	Fiji	Palau	PNG	Tonga	Samoa	Vanuatu
<b>Male</b>	1	40	1		5		11
<b>Female</b>		46	3		3		7
<b>Total Staff</b>	1	86	4		8		18
<b>female %</b>	0%	53%	75%	25%	38%	67%	39%

Source: Surveyed regulators and utilities<sup>108</sup>

**Table 23: Women Employed by Utilities**

	Tonga	Vanuatu	Nauru	Niue	Tuvalu
<b>Male</b>	196		130	18	47
<b>Female</b>	68		32	2	3
<b>Total</b>	264		162	20	50
<b>female %</b>	26%	5%* est.	20%	10%	6%

Source: Surveyed regulators and utilities<sup>109</sup>

The share of women managers in the regulator's departments varies between 15% (i.e., PNG) and 80% (i.e., Samoa) and is higher than the share of women on the Boards of utilities, varying between 16% (i.e., the Cook Islands) and 40% (i.e., Tuvalu). Please see the relevant tables below.

**Table 24: Women Managers in Regulatory Departments**

	Cook Islands	Fiji	PNG	Samoa	Vanuatu	Palau
<b>Male</b>	1	7				0
<b>Female</b>		3			2	1

<sup>108</sup> Lack of information in some of the cells in the above table indicates that the surveyed countries have not provided information relevant to these cells.

<sup>109</sup> Ibid.

<b>Total</b>	1	10			5	1
<b>Female%</b>	0%	30%	15%	80%	40%	100%

Source: Surveyed regulators and utilities<sup>110</sup>

**Table 25: Women Members in Utility Boards**

	Cook Islands		Fiji	Nauru	Tuvalu	Palau
	TAU	TMU				
<b>Male</b>	4	5	7	4	3	5
<b>Female</b>	1	1	0	1	2	1
<b>Total</b>	5	6	7	5	5	6
<b>Female%</b>	20%	16%	0%	20%	40%	17%

Source: Surveyed regulators and utilities<sup>111</sup>

Recruitment policies vary with specific focus on gender equality and balance in some countries (i.e., Nauru, Tuvalu, and the Cook Islands), and the application of an open merit recruitment system (OMRS) by regulators and utilities in countries, some of which are enacting policies about gender equity and equal employment opportunities at the same time (i.e., Fiji) or have ratified an international convention against women's discrimination (i.e., Vanuatu). In the Cook Islands and Niue, there are women in senior leadership positions in industry and government, such as the CEO of a utility and Chamber of Commerce and a chairperson of the public service commission responsible for all employment in the public sector.

### Highlights of Recruitment Policies in Energy Entities Contributing to Gender Equity and Equality

- Nauru's utility has its own Gender Action Plan with corresponding targets set through donor-related projects. The utility's plan includes a variety of components, such as a gender strategy, gender awareness and sensitivity training for management and staff, policies promoting gender equality and social inclusion, and designating a gender focal point to coordinate on gender-related issues and priorities.
- The terms and condition of service of Tuvalu's Utility (TEC) clearly state that recruitment should be implemented with a focus on promoting gender equity, such as targeting gender-diverse pools of candidates and mitigating gender bias in candidate evaluations and interviewing.
- In the Solomon Islands, SP's Human Resources Manual encourages gender balance, including women in technical fields. Also, the National Gender Equality and Women's Development Policy 2016-2020 includes a strategy of ensuring that the government's (and corporations') Human Resources policies are gender-sensitive, in part by supporting sector ministries' ability to collect sex-disaggregated data.
- OMRS, regardless of gender, applies to the regulators and utilities in Fiji, Vanuatu, Samoa, and Tonga.

<sup>110</sup> Ibid.

<sup>111</sup> Ibid.

- At the same time, the Cook Islands, the Federated States of Micronesia, Fiji, Kiribati, the Marshall Islands, Nauru, Niue (in association with New Zealand), Palau, Samoa, the Solomon Islands, Tuvalu, and Vanuatu have ratified the UN Convention on the Elimination of All Forms of Discrimination against Women (CEDAW). While most governments have some form of gender policy, the following are several examples from Fiji:
  - Fiji National Gender Policy (Ministry of Social Welfare, Women, Poverty Alleviation)
  - Gender Equity and Social Inclusion Policy (2021-2024) – Ministry of Economy
  - FCCC Human Resources Policy “Diversity & Equal Employment Opportunity Policy”
  - Employment Relations Act 2007 – “Part 9 – Equal Employment Opportunities,” sections 74-79
  - In the Cook Islands, public service is for all genders. In the power sector, there is no limitation for women in the public service (including the SOEs). At the utility (TAU), the CEO and the Chief Engineer are both women.
- In Niue, women hold positions senior officials in government, including positions related to national power supply, the secretary to the government, and the financial secretary. Women also hold senior positions in the private sector, including the CEO for the Chamber of Commerce.

Notable examples of initiatives empowering women’s participation in energy activities include credit financing options; the promotion of women in leadership, entrepreneurial, and technical positions; and incentives for women to pursue academic careers in technical and engineering fields.

#### Fiji

- Credit financing options are available via the Fiji Development Bank for women entrepreneurship based on an allocation from the Fijian national budget (FY 2022/2023)

#### Tonga

- In Tonga, rural electrification projects engage women’s participation as technicians and entrepreneurs successfully generating income from the solar freezer projects that have been developed in the outer islands of Tonga.

#### Nauru

- The Nauru Utility Corporation (NUC) has launched gender-inclusive project employment, creating positions for women technicians within the RE business.
- The NUC participates in career open days at various schools to encourage young women to consider a career path in technical and engineering fields relating to the power and water sectors.
- As a part of its Human Resource Management Policies and Procedures, the NUC continues to implement a Gender Strategy, which includes actions that support women in leadership and technical positions.

#### Cook Islands

- There is one electrical company owned by a registered woman electrician with the business of electrical contracting in commercial/residential wiring.

#### Niue

- There is an equal share of women and men participating in public consultations.

### **Current Strengths and Key Recommendations for Improvement**

The table below outlines current strengths and recommendations for improvement in relation to empowering women’s participation in energy regulation, policy, and infrastructure development under

consideration in this section. The recommendations are based on relevant international experience. These recommendations are intended to serve as a basis for designing customized follow-up actions as needed, in individual surveyed countries and across groups of surveyed countries with common regulatory challenges.

**Table 26: Identified Strengths and General Strategic Recommendations: Empowering Women's Participation in Energy Regulation, Policy, and Infrastructure Development**

Identified Strengths among Surveyed Regulators and Utilities <sup>112</sup>	General Strategic Recommendations for Possible Improvements <sup>113 114</sup>
<p>Good examples with:</p> <ul style="list-style-type: none"> <li>• Policies and regulations stipulating gender equality and equal employment opportunities for women</li> <li>• Credit financing for women entrepreneurs</li> <li>• Gender strategies to support women in leadership positions</li> <li>• Career open days in schools/universities to encourage women to pursue technical and engineering careers in energy</li> <li>• Gender inclusive projects promoting the employment of women technicians in RE projects</li> <li>• Existing mechanisms and actions taken by diverse energy sector entities to prevent and respond to sexual exploitation, abuse, and gender-based harassment</li> </ul>	<p><b>Employment</b></p> <ul style="list-style-type: none"> <li>• Expand the meaningful implementation across countries of regulations and policies stipulating gender equality, non-discrimination, and equal employment opportunities as well as supportive, gender-equitable employment benefits</li> <li>• Address harmful social and cultural norms that promote gendered views of appropriate professions and roles for women and men through gender awareness and sensitivity training and staff open dialogues</li> <li>• Provide leadership training, hands-on learning, and mentorship opportunities, especially for junior and mid-career women in energy, and facilitate scholarships/internships for young women in energy-related areas of work and study</li> <li>• Promote regional forums for women in energy for knowledge sharing and mutual support</li> <li>• Implement strategic succession planning by energy entities to increase the number of women in leadership and decision-making roles</li> </ul> <p><b>Energy Policy and Regulation</b></p> <ul style="list-style-type: none"> <li>• Ensure a strong understanding of the impacts of energy policies and regulations on women through the collection of sex-disaggregated data</li> </ul>

<sup>112</sup> In countries without formal regulators, such as Nauru, Tuvalu, and Solomon Islands, the survey covered the utilities that carry out regulatory functions.

<sup>113</sup> Recommendations are prioritized from top to bottom.

<sup>114</sup> Sourced in part from "Practical Guide to Women in Energy Regulation." USAID/NARUC. 2018.

<https://pubs.naruc.org/pub/CAA05EA6-CDCE-3F80-DBF6-56F3A3C31C8F>

	<ul style="list-style-type: none"> <li>• Integrate energy into all national-level gender-related laws and policies</li> </ul> <p><b>Infrastructure</b></p> <ul style="list-style-type: none"> <li>• Meaningfully include women in the stakeholder engagement processes</li> <li>• Ensure a strong understanding of gender-specific impacts of infrastructure projects through data collection</li> <li>• Promote the employment of women for projects</li> <li>• Provide micro-finance and business management training for women entrepreneurs</li> </ul>
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### **Suggested Actions to be Undertaken and Reported at the Next OPERA Annual Meeting**

Each of the OPERA member regulators should:

1. Undertake gender- and energy-focused analyses to identify potential improvements in the individual OPERA member and candidate member countries within the scope, with a focus on the following key entry points for promoting gender equity (and, ultimately, gender equality) in each country's energy sector:
  - Employment
  - Energy policy and regulation
  - Infrastructure

The analyses should include supplemental research, including further stakeholder consultations, to develop a more detailed analysis of the existing context and identify the country-specific priorities within the noted categories.

2. Design time-bound gender action plans to address the identified opportunities for improvement and the TA required to implement the action plans
3. Prepare presentations on the identified needs within each entry point category noted above and the related country action plans. Deliver the presentations at the next OPERA Annual Meeting.

## Annex I: Key Country and Energy Parameters

	Tonga	Nauru	Niue	Tuvalu	Palau	Samoa	Vanuatu	Cook Islands	Solomon Islands	Fiji	PNG
Population	108,819 <sup>115</sup>	10,985 <sup>116</sup>	1,654 <sup>117</sup>	12,141 <sup>118</sup>	18,297 <sup>119</sup>	201,477 <sup>120</sup>	324,834 <sup>121</sup>	17,601 <sup>122</sup>	728,520 <sup>123</sup>	911,820 <sup>124</sup>	7,275,324 <sup>125</sup> 1,600,919 <sup>126</sup> (islands)
Area (sq. km)	748	21 <sup>127</sup>	260 <sup>128</sup>	26 <sup>129</sup>	458 <sup>130</sup>	2,934 km <sup>131</sup>	12,189 <sup>132</sup>	237 <sup>133</sup>	28,450 <sup>134</sup>	18,275 <sup>135</sup>	462,840 <sup>136</sup>
Total number of islands	170	1	137	9	340	9	83	15	992	330	600

<sup>115</sup> "Tonga Population." Worldometer. <https://www.worldometers.info/world-population/tonga-population/>

<sup>116</sup> "Nauru Population." Worldometer. <https://www.worldometers.info/world-population/nauru-population/>

<sup>117</sup> "Niue Population." Worldometer.

<sup>118</sup> "Tuvalu Population." Worldometer. <https://www.worldometers.info/world-population/tuvalu-population/>

<sup>119</sup> "Palau Population." Worldometer. <https://www.worldometers.info/world-population/palau-population/>

<sup>120</sup> "Samoa Population." Worldometer. <https://www.worldometers.info/world-population/samoa-population/>

<sup>121</sup> "Vanuatu Population." Worldometer. <https://www.worldometers.info/world-population/vanuatu-population/>

<sup>122</sup> "Cook Islands Population." Worldometer. <https://www.worldometers.info/world-population/cook-islands-population/>

<sup>123</sup> "Solomon Islands Population." Worldometer. <https://www.worldometers.info/world-population/solomon-islands-population/>

<sup>124</sup> "Fiji Population." Worldometer. <https://www.worldometers.info/world-population/fiji-population/>

<sup>125</sup> "Population Map of Papua New Guinea 2011 Census Final Figures." National Statistical Office Papua New Guinea.

[https://fsccluster.org/sites/default/files/documents/book\\_2012\\_nso\\_png\\_census\\_2011.pdf](https://fsccluster.org/sites/default/files/documents/book_2012_nso_png_census_2011.pdf)

<sup>126</sup> Island population only; PNG's territory includes a main land portion and an island portion

<sup>127</sup> "What are the Key Facts of Nauru?" Maps of World. <https://www.mapsofworld.com/answers/geography/what-are-the-key-facts-of-nauru/>

<sup>128</sup> "Niue." Britannica.

<sup>129</sup> "What are the Key Facts of Tuvalu?" Maps of World. <https://www.mapsofworld.com/answers/geography/what-are-the-key-facts-of-tuvalu/>

<sup>130</sup> "Palau Geography." CountryReports. <https://www.countryreports.org/country/Palau/geography.htm>

<sup>131</sup> "Samoa." SPP Statistics for Development Division. <https://sdd.spc.int/ws>

<sup>132</sup> "What are the Key Facts of Vanuatu?" Maps of World. <https://www.mapsofworld.com/answers/geography/what-are-the-key-facts-of-vanuatu/#>

<sup>133</sup> "Cook Islands." Britannica. <https://www.britannica.com/place/Cook-Islands>

<sup>134</sup> "Solomon Islands - Location, size, and extent." Nations Encyclopedia. <https://www.nationsencyclopedia.com/Asia-and-Oceania/Solomon-Islands-LOCATION-SIZE-AND-EXTENT.html>

<sup>135</sup> "Where is Fiji in the World?" World Population Review. <https://worldpopulationreview.com/countries/fiji/location>

<sup>136</sup> "What are the Key Facts of Papua New Guinea?" Maps of World. <https://www.mapsofworld.com/answers/geography/what-are-the-key-facts-of-papua-new-guinea/>

<sup>137</sup> Empty cells in the above table indicate that there is no information available.

Total installed generation capacity (MW)	24.55	15MW	2.3MW	2.71 MW	27.4 MW	50MW <sup>138</sup>	33.74 MW		38.85 MW	393MW	95.3 MW (islands)
RE /Diesel	RE 28%/ diesel 72%	RE 13%/ diesel 87%	RE 13%/ diesel 87%	RE 19%/ diesel 81%	RE 1%/ diesel 99%	RE 46%/ diesel 54%	RE 19 %/ diesel 81% % <sup>139</sup>	RE 19%/ diesel 81%	RE 7.6%/ diesel 92.4%	RE 51%/ thermal 49%	RE 75.08%/ diesel 34.5%
Customers (Electricity)	25,000+ <sup>140</sup>	3,566 <sup>141</sup>		2,300	12,388	41,656	24,286			210,320 <sup>142</sup>	1,096,543
Access to Electricity (% of population) <sup>143</sup>	100%	100% <sup>144</sup>		100%	99.9% (0.01% off-grid)	99%	67%	100% <sup>145</sup>	73%		13%

<sup>138</sup> "Samoa – Electricity Generation." Countryeconomy.com. <https://countryeconomy.com/energy-and-environment/electricity-generation/samoa>

<sup>139</sup> Source: Vanuatu regulator

<sup>140</sup> Ibid.

<sup>141</sup> "About NUC." Nauru Utilities Corporation. <https://www.nuc.com.nr/nuc>

<sup>142</sup> Chand, Anish. "2 per cent increase in EFL customers – Report." The Fiji Times. <https://www.fijitimes.com/2-per-cent-increase-in-efl-customers-report/>

<sup>143</sup> Sources of information about electricity access (%) are provided in detail in Table 16 further below, where level of access is also discussed.

<sup>144</sup> "Access to electricity (% of population) – Nauru." The World Bank. <https://data.worldbank.org/indicator/EG.ELC.ACCS.ZS?locations=NR>

<sup>145</sup> "Energy Profile: Cook Islands." IRENA. [https://www.irena.org/IRENADocuments/Statistical\\_Profiles/Oceania/Cook%20Islands\\_Oceania\\_RE\\_SP.pdf](https://www.irena.org/IRENADocuments/Statistical_Profiles/Oceania/Cook%20Islands_Oceania_RE_SP.pdf)

## Annex 2: Tariffs in Detail

Approaches to Tariff Setting					
Country	Cost of Service/Revenue Requirement	Multi-Year Tariff	Price Cap	Performance-based	Other
<b>Fiji</b> FCCC	<ul style="list-style-type: none"> <li>Revenue requirement</li> <li>Building block methodology</li> </ul>	Four-year tariff period	<ul style="list-style-type: none"> <li>Price cap set for four years</li> <li>Intermediate/extraordinary adjustments</li> </ul>		
<b>Palau</b> PEWA	<ul style="list-style-type: none"> <li>Cost of service</li> <li>Annual tariff reviews, quarterly Automatic Fuel Price Adjustment Clause (AFPAC)</li> <li>Last annual review was in 2020</li> </ul>				
<b>Samoa</b> OOTR	<ul style="list-style-type: none"> <li>Cost of service approach</li> <li>Three-year tariff review</li> <li>Annual intermediary reviews</li> <li>Monthly review of energy charge for fuel and IPP costs</li> </ul>	Three-year tariff forecast			
<b>Tonga</b>	<ul style="list-style-type: none"> <li>Non-fuel component of the tariff is set based on the building-blocks method and then as a price cap for five years</li> <li>Annual adjustments for inflation</li> <li>Fuel/RE component – quarterly adjustments</li> </ul>	Five-year tariff period	Price cap for five years	Indicators: <ul style="list-style-type: none"> <li>Fuel efficiency</li> <li>Fuel loss target</li> <li>RE loss target</li> <li>Actual spill/battery losses/year</li> </ul>	



				<ul style="list-style-type: none"> <li>• Time of response to customer's claims</li> <li>• Adequate voltage level</li> </ul>	
<b>Vanuatu</b>  Utility Regulatory Authority (URA)	Cost of service (revenue requirement, rate of return) regulation, but there is no: <ul style="list-style-type: none"> <li>• Separation of costs by function (e.g., generation, transmission, distribution etc.)</li> <li>• Classification of costs in terms of demand-, energy, and customer-related</li> <li>• Rates are differentiated by levels of consumption</li> </ul> The last tariff review (based on Cost of Service approach) was in 2020 for two concessions (UNELCO, VUI).		Regulator sets price caps – maximum price for concessions and cooperatives	Performance targets for frequency and duration of unplanned outages	
<b>Nauru</b>  NUC	<ul style="list-style-type: none"> <li>• Utility undertakes tariff reset and cost of service and submits to the Cabinet for endorsement</li> <li>• Last tariff reset occurred five years ago. The tariff has remained unchanged since then.</li> <li>• There are no fuel adjustments of tariff.</li> </ul>				

<b>Tuvalu</b>  Tuvalu Electricity Corporation (TEC)				Indicators monitored by the TEC: <ul style="list-style-type: none"> <li>• Technical and non-technical loss</li> <li>• SAIDI and SAIFI</li> <li>• Penetration level of RE</li> </ul>	Differential model design to mitigate price volatility: <ul style="list-style-type: none"> <li>• Base tariff component – annually adjusted</li> <li>• Fuel tariff component – quarterly adjusted</li> <li>• Tariffs are differentiated by three consumption bands (50, 50, 100 kWh)</li> <li>• The Cabinet has not approved yet tariff adjustments by the model. The tariff is below cost.</li> </ul>
<b>Solomon Islands</b>  SP	Cost of service studies are carried out every five years before the review of the non-fuel component. The fuel component is adjusted every month. The World Bank funded the last cost of service study carried out by Mercados – Argentina.	<ul style="list-style-type: none"> <li>• Non-fuel component set for five years</li> <li>• Fuel component adjusted monthly</li> </ul>			

	<p>Focus on:</p> <ul style="list-style-type: none"> <li>• Definition of the revenue requirement of the utility</li> <li>• Separation of costs by function (e.g., generation, transmission, distribution etc.)</li> </ul>				
<p><b>Cook Islands</b></p> <p>Utilities TAU and TMAU</p>	<p>The tariff is based on cost components for generation, capacity/reserve, transmission and distribution, metering/customer retail. The two utilities (TAU and TMUA), as well the local administration of the outer islands (Pa Enea), use a different Excel model to calculate tariffs for the respective territories they serve.</p>	<p>Fuel is the main component in tariffs. 99% of generation capacity is based on diesel fuel. Tariffs are adjusted any time the fuel price changes.</p>			
<p><b>Niue</b></p> <p>Bulk Fuel Department, Treasury and Niue Power including Crown Law Office</p>	<p>A progressive stepped tariff is applied:</p> <ul style="list-style-type: none"> <li>• 0-100 kwh</li> <li>• 101-300kwh</li> <li>• 300+ kwh</li> </ul>	<p>The electricity tariff has not been adjusted since 2009, when the last tariff study was completed. There is a need for Niue to undertake this review soon as there are increased uses in appliances such as air conditioning in commercial/government buildings, including residential buildings and container freezers.</p>			

<b>PNG</b>	The tariff includes a demand charge and an energy charge.	<ul style="list-style-type: none"> <li>• Refer to regulatory contract Consumer Price Index (CPI) adjustments and exchange rates annually</li> <li>• The fuel price component is adjusted quarterly.</li> </ul>	<ul style="list-style-type: none"> <li>• The maximum weighted average price cap is set based on tariffs of individual consumer categories.</li> <li>• Tariffs may be designed/adjusted by service areas.</li> <li>• A one-year price cap with quarterly adjustments for fuel prices is applied in PNG.</li> </ul>		
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Country	Average tariffs (USc/kWh)	Cost-Reflectiveness	Subsidies
Fiji	17.6	*	Hydro subsidizes other generation  The government subsidizes first 100kWh with low income; and first 200kWh – schools
Palau	33	** Cost-reflective (low fuel price)	Cross-subsidy: first 150kWh for all consumers
Palau	47.8	**Cost-reflective (high fuel price)	Government subsidy: first 150kWh – free for low-income
Samoa	26.04	Cost-reflective (low fuel price)	Cross-subsidy from commercial to residential consumers
Samoa	33.5	Cost-reflective (high fuel price)	
Tonga	30.03	Cost-reflective  Fuel and RE price adjustments	Government subsidy: first 150kWh with low income; 83% government subsidy of current price increase for three months
Vanuatu - VUI	38.11	Below cost	
Vanuatu – UNELCO	41	Below cost  Due to inadequate utility reporting Low audit capacity of regulator	On a case-by-case basis at the regulator's request Cross-subsidy from high voltage to residential consumers
Nauru - FCAS	33.4	**** Below cost  No fuel price adjustments	Government subsidy: first 200kWh for all residential consumers Cross-subsidies from others to residential consumers
Tuvalu - FCAS	22.8	Actual tariff at 53% of full cost  No tariff change since 2008	Government and commercial pay higher rates than residential
Tuvalu - FCAS	42.9	Full cost	

**Notes:** Italic figures indicate estimates based on generation and sales data from financial statements.

\* Year 2021

\*\* 2022-2023 forecast with low fuel prices

\*\*\* Average estimate based on actual 2022 prices

\*\*\*\* Only O&M recovered, CAPEX from donors

	Average tariffs USc/kWh	Cost-Reflectiveness	Subsidies
<b>PNG</b>	30	*Full cost	
<b>Cook Islands</b>			
<b>TAU- Rarotonga Island</b>	34.2	**Full cost	
<b>Cook Islands / Pa Enua - Outer South Islands</b>	34.2	**Actual tariff at 80% of full cost	Budget subsidies to complement tariff to full cost
<b>TMU - Aitutaki Island</b>	42.8	**Full cost tariff	
<b>Pa Enua - Southern Outer Islands</b>			
<b>Cook Islands - FCAS</b>			
<b>Pa Enua - Northern Outer Islands</b>	30.8	**Actual tariff at 80% of full cost	Budget subsidies to complement tariff to full cost
<b>Pa Enua - Northern Outer Islands</b>	38.5	**Full cost tariff	
<b>Solomon Islands</b>	82.7	***Full cost tariff	
<b>Niue</b>	34.2	****Below cost - no adjustments since 2009	Budget subsidies to complement tariff to full cost

**Notes:**

\* “PNG National Energy Access Project (P173194).” The World Bank, p. 4.  
<https://documents1.worldbank.org/curated/en/099220010102227164/pdf/P1731940a65ee10f0beed08f2c1c84db92.pdf>

\*\* Information from the Cook Islands regulator

\*\*\* “The Project for Formulating Renewable Energy Road Map in Solomon Islands Final Report.” Solomon Islands Ministry of Mines, Energy and Rural Electrification, Solomon Power. May 2021. pg. E-2  
[https://openjicareport.jica.go.jp/pdf/12341525\\_01.pdf](https://openjicareport.jica.go.jp/pdf/12341525_01.pdf)

\*\*\*\* Estimate based on a tariff of New Zealand (NZ)\$0.60c for 101-300kWh provided by the Niue regulator within the tariff schedule below:

Tariff setting per month (NZD)

- \$0.50c for 0-100 kwh
- \$.60c for 101-300 kwh
- \$0.70c for 300+ kwh

### Annex 3: Institutional Soundness – Institutional Capacity, Independence, and Scope of Regulatory Mandate – by Country

Country	Well-Defined Mandate and Functions	Independence of Decisions	Sector(s) Regulatory Coverage	Coverage of Key Regulatory Functions
<b>Fiji</b> FCCC	FCCC Act 2010 Electricity Regulations 2019	Electricity Act 2017 Art. 14  The FCCC is not subject to the control or direction of the Minister, or any other referring authority in the performance of its functions.  The Minister for Commerce, Trade, and Tourism appoints the Chairperson (renewable tenure) and Commissioners (for a five-year term and three-year renewal) of the FCCC, pursuant to FCCC Act 2010.	The energy team at the Economic Regulations Department of the FCCC is responsible for regulating tariffs and prices for: <ul style="list-style-type: none"> <li>• Electricity</li> <li>• Water</li> <li>• Refined fuel products</li> <li>• LPG</li> <li>• Cement</li> <li>• Steel</li> </ul>	Tariffs, licensing, technical, service quality
<b>Palau</b> PEWA	Law RPPL No. 4-13 clearly stipulates the regulator's set up, functions, staffing, and financing.	The regulator (PEWA) is responsible for regulating the utility Palau Public Utilities Corporation (PPUC), with formal autonomy to regulate. The Utilities Consolidation Act also grants power to Congress to postpone tariff increases by increasing cross-subsidies to other classes.	<ul style="list-style-type: none"> <li>• Electricity</li> <li>• Water</li> <li>• Wastewater</li> </ul> Within PEWA since 2020	The regulator approves utility tariffs with further final approval by the government/Congress. The regulator handles: <ul style="list-style-type: none"> <li>• Licensing</li> <li>• Technical standards</li> <li>• Stakeholder engagements</li> <li>• Reviewing sector plans</li> </ul>

		<p>In the past, tariffs have also had to go through a consultation process with the government (including Congress and the President's office).</p> <p>The regulator is set up as an office/entity under the Ministry of Finance (House bill 11-50-5S, HDI).</p> <p>The Board of the electricity utility is appointed by the president of the country and approved by the Senate.</p> <p>There are no specific regulations preventing potential conflicts of interest linked to employment with the regulator.</p>		The regulator is responsible for integrating RE and EE measures into mainstream energy policy.
<b>Samoa</b>  OOTR	<p>The OOTR was established under the following Acts:</p> <ul style="list-style-type: none"> <li>• Telecommunications Act 2005</li> <li>• Broadcasting Act 2010</li> <li>• Electricity Act 2010</li> <li>• Postal Act 2010</li> </ul> <p>The regulator's role is to implement the above Acts.</p>	<p>By the recent amendment of the Telecommunications Act 2020:</p> <ul style="list-style-type: none"> <li>• The regulator's decisions are subject to further final approval by the Cabinet, Prime Minister, or Minister (only for telecommunications and broadcasting).</li> </ul>	<ul style="list-style-type: none"> <li>• Telecommunications</li> <li>• Broadcasting</li> <li>• Postal</li> <li>• Electricity</li> </ul>	<ul style="list-style-type: none"> <li>• Tariffs</li> <li>• Technical standards</li> <li>• Licensing</li> <li>• Dispute resolution</li> <li>• Review power sector plans</li> <li>• Approve issuance of stock by power sector licensees</li> <li>• Define power market structure and monitoring</li> <li>• QoS</li> </ul>



		<ul style="list-style-type: none"> <li>The regulator<sup>146</sup> is appointed by the Head of State at the advice of Cabinet for three years.<sup>147</sup> The regulator's employees can be also employed by regulated entities.</li> </ul>		<ul style="list-style-type: none"> <li>Consumer protection</li> <li>Stakeholder engagement</li> </ul>
<b>Tonga</b> TEC	The Electricity Act 2007 defines the regulator's functions, powers, and staffing.	<ul style="list-style-type: none"> <li>All new regulations must come from the regulator, and if they originate from the Public/Minister, then the regulator must be consulted first.</li> <li>Members of the regulatory Commission are appointed by the Cabinet for three years with possible re-appointment.</li> <li>One Commission member is appointed as Chairman.</li> <li>The Commissioners are all appointed depending on the recommendation by the Minister to the Cabinet.</li> <li>The Electricity Law, Part II on Electricity Commission, section 10</li> </ul>	<ul style="list-style-type: none"> <li>Electricity only</li> <li>Mini-grids are regulated by the Department of Energy</li> <li>An energy bill is to bring all the energy (i.e., RE, electricity, petroleum) under one (regulatory) umbrella</li> </ul>	<ul style="list-style-type: none"> <li>Tariffs</li> <li>Technical standards</li> <li>Licensing</li> <li>Dispute resolution</li> <li>QoS</li> <li>Consumer protection</li> <li>Stakeholder engagement</li> <li>The government's energy department reviews power sector plans</li> </ul>

<sup>146</sup> In Samoa, there is only one regulator for all four regulated sectors: telecommunications, broadcasting, electricity, and postal

<sup>147</sup> The Head of State is elected for five years, and members of Parliament are also elected for five years.

		<p>(i) and (ii) on Disclosure of Interest refers to compliance with the “rules of natural justice”<sup>148</sup></p> <ul style="list-style-type: none"> <li>• According to the Electricity Act Part 2, Section 6, the regulator makes decisions independently and transparently.</li> <li>• The regulator is formally accountable to the Minister for Finance and National Planning.</li> </ul>		
<p><b>Vanuatu</b></p> <p>URA</p>	<ul style="list-style-type: none"> <li>• URA Act No.11 of 2007 (as amended) establishes the regulator as an independent body and outlines functions and powers.</li> <li>• The Electricity Supply Act [CAP 65] empowers the regulator to oversee complaints about the electricity concessionaires.</li> </ul>	<ul style="list-style-type: none"> <li>• The Minister of Finance and Economic Management appoints the regulator’s chairman and commissioners through a competitive bidding process and on the recommendation of an evaluation committee for three years with a possible renewal.</li> </ul>	<ul style="list-style-type: none"> <li>• Electricity and water</li> <li>• There are plans to include the petroleum sector</li> <li>• Two mini-grids are outside the regulator’s mandate under: <ul style="list-style-type: none"> <li>○ A cooperative agreement</li> <li>○ Department of Energy Regulation</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Determine the maximum price of electricity or water</li> <li>• Reliability standards and safety standards</li> <li>• Dispute resolution regulation for IPPs</li> <li>• Power market structure and monitoring</li> <li>• QoS</li> <li>• Consumer protection</li> </ul>

<sup>148</sup> In English law, natural justice is technical terminology for **the rule against bias (nemo index in causa sua) and the right to a fair hearing (audi alteram partem)**. While the term natural justice is often retained as a general concept, it has been replaced and extended by the general “duty to act fairly.” Natural justice requires that a person receive a fair and unbiased hearing before a decision is made that will negatively affect them. The three main requirements of natural justice that must be met in every case are: **adequate notice, fair hearing, and no bias**.

	<ul style="list-style-type: none"> <li>In Vanuatu, concessionaires are subject to regulation by the regulator, except for one concession signed by the government before the establishment of the Vanuatu's regulator in 2007.</li> </ul>	<ul style="list-style-type: none"> <li>The regulator is only accountable to the parliament and relevant minister overseeing the relevant sectors under regulation (i.e., electricity, water, finance).</li> <li>The regulator has internal policies preventing conflict of interest.</li> <li>The Vanuatu Leadership Code Act [CAP 240] requires the declaration of income and assets.</li> </ul>		<ul style="list-style-type: none"> <li>Stakeholder engagement</li> </ul>
<b>Nauru</b>  NUC	There is no regulator.	There is no regulator.	There is no regulator. The NUC provides energy and water services in Nauru.	The NUC and Cabinet handle electricity (and water) tariff setting. The NUC manages: <ul style="list-style-type: none"> <li>Technical regulation</li> <li>QoS</li> <li>Review of power sector plans</li> <li>Stakeholder engagement</li> </ul>
<b>Tuvalu</b>  Tuvalu Electricity Corporation (TEC)	There is no regulator.	<ul style="list-style-type: none"> <li>The TEC Board is selected and appointed by the Cabinet for two years with a re-appointment.</li> <li>The Secretary of the Ministry of Transport, Energy, and Tourism is</li> </ul>	There is no regulator. The TEC provides electricity services in Tuvalu.	Electricity tariffs are determined by the TEC Board and approved by the government.  The TEC Board handles: <ul style="list-style-type: none"> <li>Technical standards</li> </ul>

		<p>the Chairman of the TEC Board.</p> <ul style="list-style-type: none"> <li>• The government/Cabinet is appointed for four years.</li> </ul>		<ul style="list-style-type: none"> <li>• QoS</li> <li>• Licensing</li> <li>• Dispute resolution</li> <li>• Consumer protection</li> <li>• Stakeholder engagement</li> </ul>
<b>Solomon Islands</b>	<ul style="list-style-type: none"> <li>• There is no independent regulator.</li> <li>• A review of the 1969 Electricity Act recommended the establishment of an independent regulator by 2024-2025.</li> <li>• A regulation department at the utility (SP), led by the utility's chief engineer, is focusing on ensuring technical compliance of power sector activities.</li> </ul>	<ul style="list-style-type: none"> <li>• SP has five directors.</li> <li>• The Chairman of the Board of Directors is a political appointee who then selects the five Board members.</li> <li>• The Board of Directors appoints the CEO, and the Board is also involved in the selection of managers.</li> </ul>	There is no regulator. SP handles electricity supply.	<p>SP conducts key regulatory functions related to:</p> <ul style="list-style-type: none"> <li>• Tariff setting</li> <li>• Licensing</li> <li>• Enforcing technical and QoS standards</li> <li>• Promoting RE</li> </ul> <p>SP calculates tariffs and monthly adjustments for fuel prices. These are approved the Attorney General, who is advisor to the Prime Minister.</p>

<b>Cook Islands</b>	<p>References to the regulator's role are spread across the various acts and regulations, but not specifically stated as for a single regulator. There is no relevant legislation that specifically mandates the regulator. However, there are legislations that stipulate some principal functions of the energy regulator:</p> <ul style="list-style-type: none"> <li>• Energy Act 1998</li> <li>• Energy Amendments 2012</li> <li>• Te Aponga Uira Act 1991</li> <li>• Electricity regulations</li> </ul>	<p>An Office of the Energy Commissioner, appointed by and reporting to the Minister of Energy, has been set up by law with policy coordination, tariff monitoring, and standards enforcements functions, but it is not fully operational.</p> <p>At present, the Office of the Energy Commissioner is under the Office of the Prime Minister as the Minister of Energy is also Deputy Prime Minister.</p>	<p>The regulatory functions of the energy Commissioner and two main utilities, TAU (Rarotonga Island) and TMUA (Aitutaki island), focus only on electricity supply. Utility managers of local governments in the outer islands (Pa Enua) handle both electricity and water.</p>	<p>Energy commissioners handle:</p> <ul style="list-style-type: none"> <li>• Licensing</li> <li>• Reviewing power sector plans</li> <li>• Dispute resolution among licensees – jointly with Electrical Inspectorate at the Ministry of Infrastructure</li> <li>• Technical regulation – enforcing standards jointly with Electrical Workers Association</li> <li>• Tariff setting jointly with the utilities' Boards (TAU, TMUA), ultimately approved by the Cook Islands Investment Corp. (CIIC)</li> <li>• Utilities' Boards (TAU, TMUA), CIIC</li> <li>• QoS – developing performance standards/indicators and enforcing compliance – Ministry of Infrastructure</li> </ul>
<b>Niue</b>	<ul style="list-style-type: none"> <li>• Niue has no laws yet in place that stipulate the structure, functions,</li> </ul>	<p>A regulatory position was appointed mid-2022 at the government Crown Laws</p>	<ul style="list-style-type: none"> <li>• The CLO oversees all legal requirements and</li> </ul>	<ul style="list-style-type: none"> <li>• Most of Niue's infrastructure services are owned by the</li> </ul>

	<p>mandate, and level of independence for the regulator for the electricity sector.</p> <ul style="list-style-type: none"> <li>• Niue updated its National Electricity and Power Supply Act 1960 to include a function of a regulator for the energy sector, but this amendment bill has yet to be submitted to be approved by the Cabinet, and then to the legislative assembly to enact.</li> </ul>	<p>Office (CLO) to work on the regulatory framework that covers infrastructure sectors. This framework will have to be approved by the Cabinet.</p>	<p>legislations for Niue's government.</p> <ul style="list-style-type: none"> <li>• All new regulations drafted are confirmed by the Solicitor General of the CLO before the Secretary to the Government and Cabinet Ministers.</li> <li>• The implementation of legislation and regulations falls under the director of each relevant department at the Ministry of Infrastructure – Communications, Utilities, and Transport.</li> <li>• There is a compliance and regulatory unit at the Ministry of Infrastructure – Communications, Utilities, and Transport.</li> </ul>	<p>government, and consumer protection is managed by the relevant government departments and Chamber of Commerce.</p> <ul style="list-style-type: none"> <li>• Department role: all technical matters and policies are looked after by the Heads of Department responsible for the legislation, regulations, and issuing licensing and inspections.</li> <li>• The Department of Utilities for Power Supply, Building, and Constructions issues permits, completion certificates, and water extractions licenses.</li> <li>• Electricity tariffs are managed jointly by the Niue Bulk Fuel Department, Treasury, and Niue Power corporation, including the CLO.</li> </ul>
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<b>PNG</b>	The NEA was established in 2021 with the enforcement of the NEA Act 2020 and has assumed the licensing and economic regulatory functions of the Independent Consumer and Competition Commission.	The NEA can act independently under the law, except for situations where it must comply with policy directions provided in writing by the Minister of Energy. The National Executive Council appoints the Chairman of the NEA for a period of three years.	<ul style="list-style-type: none"> <li>• Electricity supply industry and downstream gas industry</li> <li>• Bulk import of petroleum and petroleum products</li> </ul>	<ul style="list-style-type: none"> <li>• Tariff setting</li> <li>• Licensing</li> <li>• Technical regulation</li> <li>• Review of national energy sector</li> <li>• QoS</li> <li>• Consumer protection</li> <li>• The regulatory functions of the NEA have been lumped with functions of project management (i.e., electrification roll out) and community service development activities.</li> </ul>
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## Annex 4: Institutional Soundness – Transparency, Accountability, Organization, Staffing, and Regulatory Enforcement

Country	Transparency and Accountability of Regulatory Activities	Organizational Structure	Staff Composition and Capabilities, Academic Programs	Communications and Stakeholder Engagements Capacity	Capacity and Mechanism for Enforcing Regulations
<b>Fiji</b>  FCCC	<ul style="list-style-type: none"> <li>The FCCC's decisions and price authorizations/determinations are published online.</li> <li>Before regulatory decisions are published, the FCCC issues a press release/ media release to justify reasons for changes noted in tariff rates.</li> <li>The FCCC also provides/handles media queries at the time of press releases and after decisions are released.</li> </ul>	<ul style="list-style-type: none"> <li>Tariff setting – Manager of Economic Regulations, Senior Analyst, Market Analyst, Assistant Market Analyst</li> <li>Monitoring – energy team and enforcement officer</li> <li>Licensing – Inspector of technical regulations</li> <li>Enforcement of technical and QoS standards – EFL, Department of Energy, and the FCCC.</li> <li>Promotion of RE and access – Department of Energy and the Ministry of Economy</li> <li>Attracting private investments – Investment Fiji, the FCCC (tariff), Department of Energy, Fiji Rural Electrification Fund with the Ministry of Economy</li> <li>Public relations and stakeholder engagement – FCCC, Ministry of Economy/Communications,</li> </ul>	<p>The FCCC has well-trained staff with strong institutional knowledge and expertise. Some staff have knowledge in more than one field:</p> <ul style="list-style-type: none"> <li>Economist – 16%</li> <li>Lawyers – 10%</li> <li>Engineers – 1%</li> <li>Financial expert – 19%</li> <li>Other professional background – 54% (mostly enforcement officers, support team)</li> <li>Staff with institutional knowledge are hired on secondments from ministries.</li> <li>Managers and staff are hired for three years. Then, their jobs get re-advertised and they must re-apply.</li> <li>Electrical and electronics engineering, Masters</li> </ul>	<p>The FCCC has a Communications Officer.</p>	<p>The Inspector of Technical Regulations:</p> <ul style="list-style-type: none"> <li>Enforces regulation in the market through monitoring new generation sites.</li> <li>License validity and renewal are conditional upon technical inspection.</li> <li>The FCCC conducts tariff reviews.</li> </ul>



		Department of Energy, Ministry of Commerce, Trade, Tourism and Transport.	in Renewable Energy – available in national universities		
<b>Palau</b> PEWA	<ul style="list-style-type: none"> <li>The regulator, PEWA, is responsible for an annual energy report, which is publicly available.</li> <li>The Palau National Code outlines the procedures for public notice and provision of public information.</li> <li>All rules, including tariffs, must be made available to the public.</li> </ul>	A new director of PEWA was recently appointed. There are now only 1-2 other staff at PEWA.	<ul style="list-style-type: none"> <li>Inadequate in numbers, as there are only a few staff</li> <li>The position of Director has only recently been filled.</li> <li>However, the few regulatory staff are well qualified, having worked with PEWA before or (as is the case with the new Director) having served on the board of the utility (PPUC).<sup>149</sup></li> </ul>	The regulator has no designated person to handle public communications.	Technical staff will develop and enforce technical regulations.
<b>Samoa</b> OOTR	<ul style="list-style-type: none"> <li>The regulator has well-defined mechanisms for public participation in regulatory decisions and dispute resolution.</li> <li>Awareness programs inform the public of the regulator's role in addressing consumer affairs and responses to the public on issues linked to the regulated sectors (i.e., telecommunications,</li> </ul>	<p>The electricity team oversees:</p> <ul style="list-style-type: none"> <li>Tariff setting and related monitoring and reporting of the regulated entities</li> <li>Final evaluation of licenses</li> <li>Promotion of RE and access</li> <li>Attracting private investments – managed by the Ministry of Labor, Commerce, and Industry</li> </ul>	<p>21 staff including Madame regulator:</p> <ul style="list-style-type: none"> <li>Economists – 29%</li> <li>Lawyers – 5%</li> <li>Engineers – 24%</li> <li>IT officers – 10%</li> <li>Financial experts – 24%</li> <li>HR officers – 10%</li> </ul>	<ul style="list-style-type: none"> <li>Performed by all energy stakeholders</li> <li>The regulator does not have a media policy.</li> <li>There is a Social Media Policy for Government 2017 implemented by the Ministry of Communications</li> </ul>	The Electricity Technical Officer team enforces standards and QoS.

<sup>149</sup> "PPUC." Palau Public Utilities Corporation. <https://www.ppuc.com/>

	<p>broadcasting, electricity, and postal services).</p> <ul style="list-style-type: none"> <li>• The regulator publishes annual reports for the public interest.</li> <li>• All publications are on the regulator's website and posted on its Facebook page, TV, and radio.</li> <li>• According to the Electricity Act 2010, appeals can be taken to a tribunal (Part 10: Appeals).</li> </ul>	<ul style="list-style-type: none"> <li>• Any other departments contribute to electricity regulation tasks as needed</li> </ul>	<ul style="list-style-type: none"> <li>• The regulator uses both in-house skills and outsourcing.</li> <li>• Development partners provide funding for consultants to support the regulator's work (e.g., ADB, International Telecommunications Union [ITU], Asia-Pacific Telecommunity [APT], etc.)</li> <li>• The regulator does not borrow staff from other government agencies.</li> </ul>	and Information Technology (MCIT).	
<b>Tonga</b>  TEC	<p>The regulator is accountable to stakeholders (such as government/consumers) – through:</p> <ul style="list-style-type: none"> <li>• The annual report on its website</li> <li>• Public awareness programs – live talk show on the radio and TV programs</li> <li>• The (tariff) reset process and decision was published in newspapers and on the regulator's website for the public to comment on before it was finalized.</li> </ul>	<ul style="list-style-type: none"> <li>• Commissioner</li> <li>• CEO</li> <li>• Financial Controller/Regulatory Auditor (vacant)</li> <li>• Assistant accountants</li> <li>• Technical Manager</li> <li>• Deputy Technical Manager</li> <li>• Technical Assistant</li> </ul>	<ul style="list-style-type: none"> <li>• A certificate in electrical engineering is offered in a local technical school and the rest are overseas courses.</li> <li>• Staff have background in: <ul style="list-style-type: none"> <li>○ Electrical engineering</li> <li>○ Accounting</li> <li>○ Computer science</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• No formal media policy</li> <li>• The CEO and the Manager of the Technical Division handle communications with the public.</li> </ul>	<ul style="list-style-type: none"> <li>• The regulator's technical staff has the capacity to enforce the technical regulations.</li> <li>• A concession contract requires prior approval by the regulator.</li> </ul>

	<ul style="list-style-type: none"> <li>According to the Concession Agreement, an appeal on the regulator's decision must be taken to arbitration.</li> </ul>				
<b>Vanuatu</b>  <b>URA</b>	<p>The regulator:</p> <ul style="list-style-type: none"> <li>Publishes its annual report on its activities</li> <li>Holds in-person consultations with stakeholders</li> <li>Issues educational awareness promotional clips for electricity and water consumers</li> <li>Disseminates information and data to stakeholders through: <ul style="list-style-type: none"> <li>Email, video/media clips</li> <li>Meetings (either virtual or in person)</li> <li>Regulator's website, Facebook</li> </ul> </li> <li>The regulator's decisions can be appealed using a 30-day grievance mechanism.</li> </ul>	<ul style="list-style-type: none"> <li>Corporate Division</li> <li>Engineering and Consumer Care Division</li> <li>Legal Division</li> <li>Economics and Tariff Evaluation Division</li> <li>Finance, Accounting, and Audit Division</li> </ul>	<ul style="list-style-type: none"> <li>Current number of staff – 16 <ul style="list-style-type: none"> <li>Economists – 13%</li> <li>Accounting &amp; Finance – 13%</li> <li>Engineers – 25%</li> <li>Corporate – 38%</li> <li>Legal – 6%</li> <li>Consumer Specialist – 6%</li> </ul> </li> <li>Received regulatory training with the World Bank and partner regulators</li> <li>The World Bank and the Australian Government funded TA for the regulator. Now, in-house capacity is available for electricity tariff reviews and technical assessments in the electricity sector.</li> <li>No academic programs in the country aligned to regulatory functions</li> </ul>	<ul style="list-style-type: none"> <li>A communications policy is in place.</li> <li>The Executive Officer oversees public communications</li> <li>Regulatory commission decisions are subject to stakeholder consultations prior to issuance.</li> </ul>	<ul style="list-style-type: none"> <li>The regulator has a mandate by law to issue technical regulations.</li> <li>Non-compliance with technical regulations triggers an infringement notice to the relevant utility with a possibility of financial penalty or litigation to enforce compliance.</li> </ul>

<b>Nauru</b> NUC	<p>There is no regulator. Regulatory functions are managed by:</p> <ul style="list-style-type: none"> <li>• Nauru Utility Corporation (NUC) and Cabinet (tariffs), and</li> <li>• NUC – technical standards</li> </ul> <p>The NUC publishes annual reports and electricity and water tariffs on its company website.</p>	N/A	N/A	The NUC has a manager for customer service.	<p>The NUC manages:</p> <ul style="list-style-type: none"> <li>• Technical regulation</li> <li>• QoS</li> <li>• Review of power sector plans</li> <li>• Stakeholder engagements</li> </ul>
<b>Solomon Islands</b>	<p>There is no regulator. The utility (SP) publishes annual and half-year reports on its website and submits them to the Ministry of Finance and Ministry of Mines and Energy as stipulated in the SOE Act 2007.</p>	<p>The following divisions report to the CEO of SP:</p> <ul style="list-style-type: none"> <li>• Engineering</li> <li>• Special projects and planning</li> <li>• Legal</li> <li>• Corporate division</li> <li>• Customer service</li> <li>• ICT</li> <li>• Financing</li> <li>• Capital works – new construction, new generation, network extension; built two hybrid systems, 200kW each, and</li> </ul>	<ul style="list-style-type: none"> <li>• SP uses international consultants for tariff analysis. Engineering licensing is conducted in-house.</li> <li>• The Regulating Department has ten staff (electrical technicians and engineers).</li> <li>• The Financing Department includes CPAs, a Chief Financial Officer, Manager of Accounting, and General Manager for Customer service, handling tariff calculations and reviews. The</li> </ul>	<ul style="list-style-type: none"> <li>• The tariff non-fuel component is discussed through stakeholder consultations.</li> <li>• Information about upcoming tariff adjustments for fuel are posted on Facebook and SP's website.</li> <li>• Consultants prepare cost of service studies and present publicly the results.</li> <li>• Stakeholder consultations are held to discuss:</li> </ul>	<ul style="list-style-type: none"> <li>• The Regulation Department at SP is focusing on ensuring technical compliance, with ten staff under the leadership of the Chief Engineer.</li> <li>• The licenses of technical inspectors are validated annually (by SP's Engineering Department) – these inspectors oversee installation works, so they need a license for such installation work.</li> </ul>

		receives grants/loans from ADB/the World Bank	<p>consulting firm ECA calculated the tariffs</p> <ul style="list-style-type: none"> <li>• The Solomon Islands National University issues certificates in electricity trade.</li> <li>• Engineering degrees can be obtained in Fiji, New Zealand, and Australia.</li> <li>• The University of South Pacific has a campus in the capital Honiara and offers only certificates and diplomas in accounting and economics.</li> </ul>	<ul style="list-style-type: none"> <li>○ The proposed amendments to the 1969 Electricity Act (by Castalia)</li> <li>○ Distribution network plans to validate (electricity) demand with key stakeholders</li> <li>• The Customer Service Department manages customer complaints with timely standards for answering phones and addressing issues.</li> </ul>	<ul style="list-style-type: none"> <li>• The Chief Inspector is the officer in charge of electrical engineering within the utility and their decisions can be appealed in court.</li> </ul>
<b>Cook Islands</b>	<ul style="list-style-type: none"> <li>• Communications from utilities to the public take place face-to-face, and through TV/radio and websites</li> <li>• The Boards of the two utilities – TAU and TMUA – release tariff information to the public</li> </ul>	<p>Regulatory activities are conducted through:</p> <ul style="list-style-type: none"> <li>• The two utilities (TAU for Rarotonga Island, and TMUA – for Aitutaki Island)</li> <li>• The local administration in the Outer Islands (Pa Enua)</li> <li>• The Office of the Energy Commissioner</li> </ul>	<ul style="list-style-type: none"> <li>• The Office of the Energy Commissioner is not fully operational and not properly staffed yet.</li> <li>• The Boards of the two utilities – TAU and TMUA – engage in regulatory activities.</li> <li>• An electrical workers association is involved in technical regulation and maintains good workmanship up to standard.</li> <li>• The Electrical Inspectorate – a part of the Ministry of</li> </ul>	<ul style="list-style-type: none"> <li>• The utilities have their own Communication Officer, but the Office of the Energy Commissioner does not have one.</li> <li>• Other government agencies are also involved in stakeholder engagements</li> </ul>	<ul style="list-style-type: none"> <li>• The utilities do their own regulatory work and enforcement, and the Outer Islands administration (Pa Enua) do their own regulatory work.</li> <li>• However, the Ministry of Infrastructure (ICI) issues electrical worker licenses and permits for any electrical work.</li> </ul>

			<p>Infrastructure – is involved in dispute resolution among licensees.</p> <ul style="list-style-type: none"> <li>• The Consumer Affairs Units of the utility (TAU) and Ministry of Infrastructure handle customer service, including complaints</li> <li>• QoS is managed by the Ministry of Infrastructure.</li> <li>• The utilities' Boards and the Cook Islands Investment Corporation manage market structure and monitoring.</li> </ul>		
<b>Niue</b>	<p>A Compliance and Regulatory Unit and sector departments at the Ministry of Infrastructure – Communications, Utilities, and Transport will be responsible for implementing a new infrastructure regulatory framework, which is yet to be developed.</p>	<ul style="list-style-type: none"> <li>• Most Niue Infrastructure services are owned by the government. Therefore, the bulk of the consumer protection activities are based on the combined efforts of the corresponding government departments and the Chamber of Commerce.</li> </ul>	<p>A public sector employment authority (the Niue Public Services commission) ensures that experts with adequate credentials and experience are responsible for monitoring/implementing each core regulatory function.</p>	<ul style="list-style-type: none"> <li>• The government has established a sector that is responsible for all government press release and TV/radio media, including social media platforms.</li> <li>• Stakeholder engagements are easy to undertake due to the small population of 1,654<sup>150</sup> and land area of 260 sq. km (100 sq. miles)<sup>151</sup> and</li> </ul>	<p>All technical matters and policies are managed by the Heads of Department at the:</p> <ul style="list-style-type: none"> <li>• Ministry of Infrastructure – Communications, Utilities, and Transport is responsible for legislation and regulations, issuing licensing and inspections</li> </ul>

<sup>150</sup> "Niue Population." Worldometer.

<sup>151</sup> "Niue." Britannica.

		<ul style="list-style-type: none"> <li>• Proposed regulatory structure includes Department of Utilities responsible for water, building and constructions inspectors, staffed with engineers; energy and power – engineers, linesmen, RE</li> <li>• Treasury – for finances, billing, and debtors – economist, accountant</li> <li>• Communications broadcasting – frequencies backhaul – engineers</li> <li>• Standards are not yet established, but Niue is very interested in establishing relevant policy and legislation.</li> </ul>		<p>communities' close ties to the government.</p> <ul style="list-style-type: none"> <li>• Initiatives to attract the private sector are applied during public consultations.</li> <li>• Stakeholder consultations are well-represented in terms of gender equity.</li> <li>• There are more than 20 national consultations events held in Niue each year, so there is strong representation from wider communities.</li> </ul>	<ul style="list-style-type: none"> <li>• The Department of Utilities for Power Supply, Building, and Construction issues permits and completion certificates, along with water extraction licenses.</li> </ul>
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<b>PNG</b>	<p>The regulator (NEA) is accountable to the government of the independent state of PNG.</p>	<p>The regulator has the following divisions:</p> <ul style="list-style-type: none"> <li>• Economic regulation</li> <li>• Technical regulation</li> <li>• Policy planning and research</li> <li>• Community outreach</li> <li>• NEA Managing Director's Office</li> </ul>	<ul style="list-style-type: none"> <li>• Currently, the NEA is recruiting officers. About 25% of the necessary staff has been recruited through the government's Salary Conditions and Monitoring Committee (SCMC).</li> <li>• The regulator receives funding for consultants to support regulatory work through the PNG Electrification Partnership with USAID (2020-2025) and multi-lateral agencies.</li> <li>• There are no academic programs in the country related to power sector regulation.</li> </ul>	<ul style="list-style-type: none"> <li>• The NEA's Community Outreach Division is responsible for NEA's promotions, awareness, and campaigns on any stakeholder engagements relating to the NEA's roles and responsibilities.</li> <li>• The Managing Director's Office and NEA Media Officer manage communications and stakeholder engagements.</li> </ul>	<ul style="list-style-type: none"> <li>• The regulator has the capacity to enforce technical regulations and all other decisions/rulings it makes through authorized officers, who are being hired.</li> <li>• The Technical Regulation Division in collaboration with NISIT<sup>152</sup> is developing electrical codes and standards.</li> <li>• The NEA will issue regulatory contracts to the utility PNG Power Ltd (PPL) that contain performance standards (i.e., minimum service standards).</li> </ul>
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<sup>152</sup> NISIT - National Institute of Standards and Industrial Technology



## Annex 5: Training Needs<sup>153</sup>

### Vanuatu

What are the regulator's training needs? (In the table below, please rank by priorities on a scale from 1 to 10, **10 being the highest priority** and 1 – the lowest)

	Training Needs	Priority ranking
1	Infrastructure reliability and service quality	10
	DG	6
	Cybersecurity	6
2	Cost of service studies	9
3	Economic evaluation of power generation and transmission projects	8
4	Technical standards	7
5	Tariff setting	6
6	Power generation and transmission planning	5
7	Regulatory accounting and reporting	5
8	Regulatory independence	5
9	Integrated resource planning	5
10	Feed-in tariffs	4
11	Function and objectives of the regulator	3
12	Strategic planning of the power grid	3
13	EE	3
14	PPAs	2
15	Basic economics of operating the power grid	2
16	Basic knowledge in the electricity grid's operations	2
17	Legal powers of the regulator	1

<sup>153</sup> The ranking of the training needs has been applied at the sole discretion of representatives of individual regulators in consideration of the specific training needs and related priorities of the individual regulators.

**Tonga**

What are the regulator's training needs? (In the table below, please rank by priorities on a scale from 1 to 10, **10 being the highest priority** and 1 – the lowest)

	<b>Training Needs</b>	<b>Priority ranking</b>
1	PPAs	<b>9</b>
2	Tariff setting	<b>9</b>
3	Legal powers of the regulator	<b>9</b>
4	Regulatory accounting and reporting	<b>9</b>
5	Utility finance	<b>9</b>
6	Basic knowledge in the electricity grid's operations	<b>8</b>
7	Technical standards	<b>8</b>
8	Basic economics of operating the power grid	<b>8</b>
9	Economic evaluation of power generation and transmission projects	<b>8</b>
10	Feed-in tariffs	<b>8</b>
11	Infrastructure reliability and service quality	<b>8</b>
	<i>Grid code</i>	<b>8</b>
	<i>DG</i>	<b>8</b>
	<i>Service quality, metering, and customer service</i>	<b>7</b>
	<i>Licensing of generation (incl. RE) and distribution facilities</i>	<b>7</b>
	<i>Demand response/demand side management</i>	<b>7</b>
	<i>Resilience, disaster preparedness and mutual assistance</i>	<b>7</b>
	<i>Cybersecurity</i>	<b>7</b>
12	Power market development	<b>8</b>
	<i>Power markets design</i>	<b>7</b>
	<i>Power market monitoring</i>	<b>7</b>
	<i>Ancillary and balancing services</i>	<b>7</b>
	<i>Unbundling</i>	<b>7</b>
	<i>Utility business models</i>	<b>7</b>
13	Strategic planning of the power grid	<b>7</b>
14	Function and objectives of the regulator	<b>7</b>
15	Power generation and transmission planning	<b>7</b>
16	Media engagement and public outreach	<b>7</b>
	<i>Consumer affairs and handling complaints</i>	<b>7</b>
	<i>Intergovernmental relations</i>	<b>7</b>
17	EE	<b>7</b>
18	Renewable portfolio standards	<b>7</b>
19	Regulatory independence	<b>7</b>
20	Reverse auctions	<b>7</b>
21	Integrated resource planning	<b>7</b>
22	Cost of service studies	<b>6</b>

**Palau**

What are the regulator's training needs? (In the table below, please rank by priorities on a scale from 1 to 10, 10 being the highest priority and 1 – the lowest)

	<b>Training Needs</b>	<b>Priority ranking</b>
1	Basic knowledge in the electricity grid's operations	10
2	Legal powers of the regulator	10
3	Function and objectives of the regulator	10
4	Utility finance	10
5	Infrastructure reliability and service quality	10
6	Basic economics of operating the power grid	9
7	Tariff setting	9
8	Media engagement and public outreach	9
9	Regulatory accounting and reporting	9
10	EE	9
11	Cost of service studies	9
12	Technical standards	8
13	Economic evaluation of power generation and transmission projects	8
14	Renewable portfolio standards	8
15	Integrated resource planning	8
16	PPAs	7
17	Power market development	7
18	Regulatory independence	5

**Fiji**

What are the regulator's training needs? (In the table below, please rank by priorities on a scale from 1 to 10, **10 being the highest priority** and 1 – the lowest)

	<b>Training Needs</b>	<b>Priority ranking</b>
1	Basic knowledge in the electricity grid's operations	<b>10</b>
2	Technical standards	<b>10</b>
3	Basic economics of operating the power grid	<b>10</b>
4	Tariff setting	<b>10</b>
5	PPAs	<b>10</b>
6	Legal powers of the regulator	<b>10</b>
7	Strategic planning of the power grid	<b>10</b>
8	Power generation and transmission planning	<b>10</b>
9	Economic evaluation of power generation and transmission projects	<b>10</b>
10	Regulatory accounting and reporting	<b>10</b>
11	EE	<b>10</b>
12	Renewable portfolio standards	<b>10</b>
13	Feed-in tariffs	<b>10</b>
14	Cost of service studies	<b>10</b>
15	Utility finance	<b>10</b>
16	Reverse auctions	<b>10</b>
17	Integrated resource planning	<b>10</b>
18	Power market development	<b>10</b>
	<i>Power markets design</i>	<b>10</b>
	<i>Power market monitoring</i>	<b>10</b>
	<i>Ancillary and balancing services</i>	<b>10</b>
	<i>Unbundling</i>	<b>10</b>
	<i>Utility business models</i>	<b>10</b>
19	Infrastructure reliability and service quality	<b>10</b>
	<i>Service quality, metering, and customer service</i>	<b>10</b>
	<i>Grid code</i>	<b>10</b>
	<i>Demand response/demand side management</i>	<b>10</b>
	<i>DG</i>	<b>10</b>
	<i>Resilience, disaster preparedness and mutual assistance</i>	<b>10</b>
	<i>Cybersecurity</i>	<b>10</b>
	<i>Licensing of generation (incl. RE) and distribution facilities</i>	<b>8</b>
20	Any other area of interest (infrastructure development for EV's, supplying power via submarine cables to other pics)	<b>10</b>
21	Function and objectives of the regulator	<b>8</b>
22	Media engagement and public outreach	<b>8</b>
	<i>Consumer affairs and handling complaints</i>	<b>8</b>
	<i>Intergovernmental relations</i>	<b>8</b>
23	Regulatory independence	<b>5</b>

**Samoa**

What are the regulator's training needs? (In the table below, please rank by priorities on a scale from 1 to 10, **10 being the highest priority** and 1 – the lowest)

	<b>Training Needs</b>	<b>Priority ranking</b>
1	Tariff setting	<b>10</b>
2	Regulatory accounting and reporting	<b>10</b>
3	Cost of service studies	<b>10</b>
4	Utility finance	<b>10</b>
5	Technical standards	<b>9</b>
6	PPAs	<b>9</b>
7	Feed-in tariffs	<b>9</b>
8	Legal powers of the regulator	<b>8</b>
9	Renewable portfolio standards	<b>8</b>
10	Integrated resource planning	<b>8</b>
11	Power market development	<b>8</b>
	<i>Power markets design</i>	<b>5</b>
	<i>Power market monitoring</i>	<b>5</b>
	<i>Ancillary and balancing services</i>	<b>5</b>
	<i>Unbundling</i>	<b>5</b>
	<i>Utility business models</i>	<b>5</b>
12	Basic knowledge in the electricity grid's operations	<b>7</b>
13	Basic economics of operating the power grid	<b>7</b>
14	Economic evaluation of power generation and transmission projects	<b>7</b>
15	Function and objectives of the regulator	<b>6</b>
16	Strategic planning of the power grid	<b>6</b>
17	Power generation and transmission planning	<b>6</b>
18	Infrastructure reliability and service quality	<b>4</b>
	<i>Resilience, disaster preparedness and mutual assistance</i>	<b>10</b>
	<i>Cybersecurity</i>	<b>10</b>
	<i>Service quality, metering, and customer service</i>	<b>4</b>
	<i>Grid code</i>	<b>4</b>
	<i>Licensing of generation (incl. RE) and distribution facilities</i>	<b>4</b>
	<i>Demand response/demand side management</i>	<b>4</b>
	<i>DG</i>	<b>4</b>
19	Media engagement and public outreach	<b>3</b>
	<i>Consumer affairs and handling complaints</i>	<b>3</b>
	<i>Intergovernmental relations</i>	<b>3</b>
20	EE	<b>2</b>
21	Regulatory independence	<b>2</b>
22	Reverse auctions	<b>1</b>

## Solomon Islands

What are the regulator's training needs? (In the table below, please rank by priorities on a scale from 1 to 10, 10 being the highest priority and 1 – the lowest)

	Training Needs	Priority ranking
1	Basic economics of operating the power grid	10
2	Tariff setting	10
3	Function and objectives of the regulator	10
4	Economic evaluation of power generation and transmission projects	10
5	Regulatory accounting and reporting	10
6	Regulatory independence	10
7	Feed-in tariffs	10
8	Cost of service studies	10
9	Reverse auctions	10
10	Integrated resource planning	10
11	Infrastructure reliability and service quality	10
	<i>Service quality, metering, and customer service</i>	10
	<i>Grid code</i>	10
	<i>Licensing of generation (incl. RE) and distribution facilities</i>	10
	<i>Demand responsedemand side management</i>	10
	<i>DG</i>	10
	<i>Resilience, disaster preparedness and mutual assistance</i>	10
	<i>Cybersecurity</i>	10
12	PPAs	8
13	Legal powers of the regulator	8
14	Renewable portfolio standards	8
15	Utility finance	7
16	Power market development	7
	<i>Power markets design</i>	7
	<i>Power market monitoring</i>	7
	<i>Ancillary and balancing services</i>	7
	<i>Unbundling</i>	7
	<i>Utility business models</i>	7
17	Strategic planning of the power grid	5
18	Power generation and transmission planning	5
19	Media engagement and public outreach	5
20	EE	5

### Cook Islands

What are the regulator's training needs? (In the table below, please rank by priorities on a scale from 1 to 10, **10 being the highest priority** and 1 – the lowest)

	Training Needs	Priority ranking
1	Function and objectives of the regulator	10
2	Legal powers of the regulator	9
3	PPAs	8
4	Technical standards	7
5	Basic economics of operating the power grid	7
6	Media engagement and public outreach	7
7	Basic knowledge in the electricity grid's operations	6
8	Tariff setting	6
9	Strategic planning of the power grid	6
10	Economic evaluation of power generation and transmission projects	6
11	EE	6
12	Power generation and transmission planning	5
13	Renewable portfolio standards	5
14	Regulatory independence	5
15	Integrated resource planning	5
16	Power market development	5
17	Infrastructure reliability and service quality	5
18	Feed-in tariffs	4
19	Cost of service studies	4
20	Utility finance	4
21	Reverse auctions	4
22	Regulatory accounting and reporting	3

**Tuvalu**

What are the regulator's training needs? (In the table below, please rank by priorities on a scale from 1 to 10, **1 being the highest priority** and 22 – the lowest)

	<b>Training Needs</b>	<b>Priority ranking</b>
1	Legal powers of the regulator	<b>1</b>
2	Function and objectives of the regulator	<b>2</b>
3	Regulatory independence	<b>3</b>
4	Regulatory accounting and reporting	<b>4</b>
5	Tariff setting	<b>5</b>
6	Basic knowledge in the electricity grid's operations	<b>6</b>
7	Strategic planning of the power grid	<b>7</b>
8	Economic evaluation of power generation and transmission projects	<b>8</b>
9	Technical standards	<b>9</b>
10	Basic economics of operating the power grid	<b>10</b>
11	PPAs	<b>11</b>
12	Power generation and transmission planning	<b>12</b>
13	Renewable portfolio standards	<b>13</b>
14	Feed-in tariffs	<b>14</b>
15	Utility finance	<b>15</b>
16	Cost of service studies	<b>16</b>
17	Infrastructure reliability and service quality	<b>17</b>
18	Integrated resource planning	<b>18</b>
19	EE	<b>19</b>
20	Power market development	<b>20</b>
21	Reverse auctions	<b>21</b>
22	Media engagement and public outreach	<b>22</b>



**Niue**

What are the regulator's training needs? (In the table below, please rank by priorities on a scale from 1 to 10, 10 being the highest priority and 1 – the lowest)?

	<b>Training Needs</b>	<b>Priority ranking</b>
1	Legal powers of the regulator	10
2	Function and objectives of the regulator	10
3	Regulatory accounting and reporting	10
4	Regulatory independence	10
5	Feed-in tariffs	10
6	Infrastructure reliability and service quality	10
	<i>Service quality, metering, and customer service</i>	10
	<i>Cybersecurity</i>	10
	<i>Demand response/demand side management</i>	9
	<i>Resilience, disaster preparedness and mutual assistance</i>	9
	<i>Grid code</i>	8
	<i>Licensing of generation (incl.RE) and distribution facilities</i>	8
	<i>DG</i>	5
7	Basic knowledge in the electricity grid's operations	9
8	Tariff setting	9
9	PPAs	9
10	Technical standards	8
11	Reverse auctions	8
12	Strategic planning of the power grid	8
13	Economic evaluation of power generation and transmission projects	8
14	Media engagement and public outreach	8
	<i>Consumer affairs and handling complaints</i>	7
	<i>Intergovernmental relations</i>	5
15	Power generation and transmission planning	7
16	Basic economics of operating the power grid	7
17	EE	7
18	Renewable portfolio standards	7
19	Utility finance	7
20	Cost of service studies	5
21	Integrated resource planning	5
22	Power market development	5
	<i>Power market monitoring</i>	8
	<i>Utility business models</i>	6
	<i>Power markets design</i>	5
	<i>Ancillary and balancing services</i>	5
	<i>Unbundling</i>	4

**PNG**


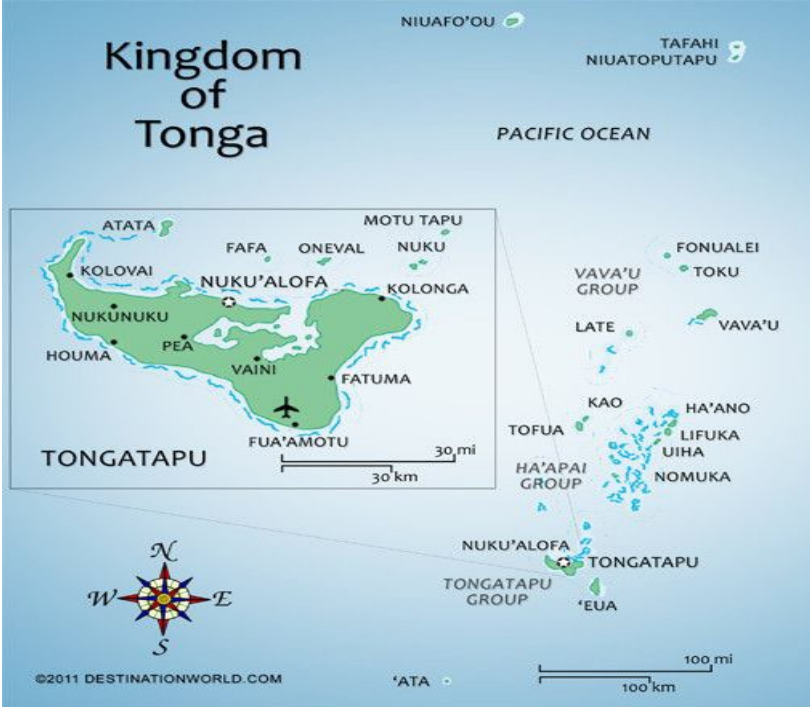
What are the regulator's training needs? (In the table below, please rank by priorities on a scale from 1 to 10, 10 being the highest priority and 1 – the lowest)?

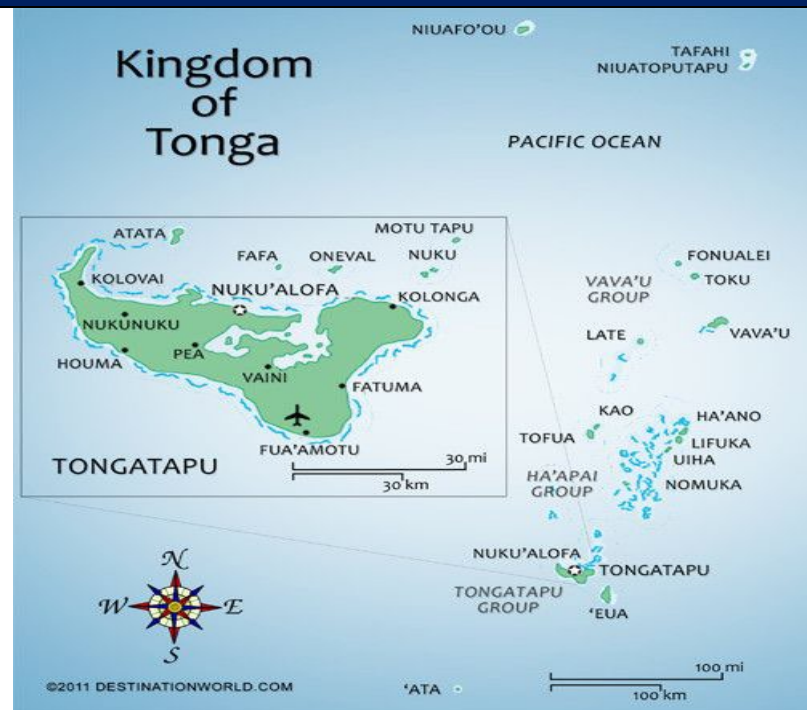
	<b>Training Needs</b>	<b>Priority ranking</b>
1	Tariff setting	10
2	Regulatory accounting and reporting	10
3	Cost of service studies	10
4	Utility finance	10
5	Technical standards	10
6	PPAs	10
7	Feed-in tariffs	10
8	Legal powers of the regulator	10
9	Renewable portfolio standards	10
10	Integrated resource planning	10
11	Power market development	10
	<i>Power markets design</i>	10
	<i>Power market monitoring</i>	10
	<i>Ancillary and balancing services</i>	10
	<i>Unbundling</i>	10
	<i>Utility business models</i>	10
12	Basic knowledge in the electricity grid's operations	10
13	Basic economics of operating the power grid	10
14	Economic evaluation of power generation and transmission projects	10
15	Function and objectives of the regulator	10
16	Strategic planning of the power grid	10
17	Power generation and transmission planning	10
18	Infrastructure reliability and service quality	10
	<i>Resilience, disaster preparedness and mutual assistance</i>	10
	<i>Cybersecurity</i>	10
	<i>Service quality, metering, and customer service</i>	10
	<i>Grid code</i>	10
	<i>Licensing of generation (incl. RE) and distribution facilities</i>	10
	<i>Demand response/demand side management</i>	10
	<i>DG</i>	10
19	Media engagement and public outreach	10
	<i>Consumer affairs and handling complaints</i>	10
	<i>Intergovernmental relations</i>	10
20	EE	10
21	Regulatory independence	10
22	Reverse auctions	10
23	Any other areas of interest: corporate governance and project financing, management, leadership training, coaching, customer service, business etiquette, financial modelling, twinning/secondment trainings on similar regulatory, cost-benefit analysis, tariff price setting, PPA training, GIS & mapping, training, MS office training, smart metering technology training, cloud training, cybersecurity training (watchful on hacking)	10

Consolidated priority ranking scores by the surveyed countries													
No.	Training Needs	Fiji	Sam oa	Ton ga	Vanu atu	Tuv alu	Pal au	PN G	Ni ue	Solomon Islands	Cook Islands	Grand Total Score	Grand Total Ranking
1	Legal powers of the regulator	10	8	9	1	10	10	10	10	8	9	85	1
2	Tariff setting	10	10	9	6	6	9	10	9	10	6	85	1
3	Regulatory accounting and reporting	10	10	9	5	7	9	10	10	10	3	83	2
4	Function and objectives of the regulator	8	6	7	3	9	10	10	10	10	10	83	2
5	Economic evaluation of power generation and transmission projects	10	7	8	8	3	8	10	8	10	6	78	3
6	Infrastructure reliability and service quality	10	4	8	10	0	10	10	10	10	5	77	4
	<i>Service quality, metering, and customer service</i>	<i>10</i>	<i>4</i>	<i>7</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>10</i>	<i>10</i>	<i>10</i>	<i>0</i>	<i>51</i>	<i>19</i>
	<i>Grid code</i>	<i>10</i>	<i>4</i>	<i>8</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>10</i>	<i>8</i>	<i>10</i>	<i>0</i>	<i>50</i>	<i>20</i>
	<i>Licensing of generation (incl. RE) and distribution facilities</i>	<i>8</i>	<i>4</i>	<i>7</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>10</i>	<i>8</i>	<i>10</i>	<i>0</i>	<i>47</i>	<i>21</i>
	<i>Demand response/demand side management</i>	<i>10</i>	<i>4</i>	<i>7</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>10</i>	<i>9</i>	<i>10</i>	<i>0</i>	<i>50</i>	<i>20</i>
	<i>DG</i>	<i>10</i>	<i>4</i>	<i>8</i>	<i>6</i>	<i>0</i>	<i>0</i>	<i>10</i>	<i>5</i>	<i>10</i>	<i>0</i>	<i>53</i>	<i>18</i>
	<i>Resilience, disaster preparedness, and mutual assistance</i>	<i>10</i>	<i>10</i>	<i>7</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>10</i>	<i>9</i>	<i>10</i>	<i>0</i>	<i>56</i>	<i>16</i>
	<i>Cybersecurity</i>	<i>10</i>	<i>10</i>	<i>7</i>	<i>6</i>	<i>0</i>	<i>0</i>	<i>10</i>	<i>10</i>	<i>10</i>	<i>0</i>	<i>63</i>	<i>11</i>
7	Cost of service studies	10	10	6	9	0	9	10	5	10	4	73	5
8	PPAs	10	9	9	2	0	7	10	9	8	8	72	6
9	Basic economics of operating the power grid	10	7	8	2	1	9	10	7	10	7	71	7
10	Technical standards	10	9	8	7	2	8	10	8	0	7	69	8
11	Utility finance	10	10	9	0	0	10	10	7	7	4	67	9
12	Basic knowledge of the electricity grid's operations	10	7	8	2	5	10	10	9	0	6	67	9
13	Regulatory independence	5	2	7	5	8	5	10	10	10	5	67	9

14	<b>Feed-in tariffs</b>	10	9	8	4	0	0	10	10	10	4	65	<b>10</b>
15	<b>Renewable portfolio standards</b>	10	8	7	0	0	8	10	7	7	5	62	<b>12</b>
16	<b>Integrated resource planning</b>	10	8	7	5	0	0	10	5	10	5	60	<b>13</b>
17	<b>Power market development</b>	10	8	8	0	0	7	10	5	7	5	60	<b>13</b>
	<i>Power markets design</i>	10	5	7	0	0	0	10	5	7	0	44	23
	<i>Power market monitoring</i>	10	5	7	0	0	0	10	8	7	0	47	21
	<i>Ancillary and balancing services</i>	10	5	7	0	0	0	10	5	7	0	44	23
	<i>Unbundling</i>	10	5	7	0	0	0	10	4	7	0	43	24
	<i>Utility business models</i>	10	5	7	0	0	0	10	6	7	0	45	22
18	<b>EE</b>	10	2	7	3	0	9	10	7	5	6	59	<b>14</b>
19	<b>Strategic planning of the power grid</b>	10	6	7	3	4	0	10	8	5	6	59	<b>14</b>
20	<b>Media engagement and public outreach</b>	8	3	7	0	0	9	10	8	5	7	57	<b>15</b>
	<i>Consumer affairs and handling complaints</i>	8	3	7	0	0	0	10	7	0	0	35	25
	<i>Intergovernmental relations</i>	8	3	7	0	0	0	10	5	0	0	33	26
21	<b>Power generation and transmission planning</b>	10	6	7	5	0	0	10	7	5	5	55	<b>17</b>
22	<b>Reverse auctions</b>	10	1	7	0	0	0	10	8	10	4	50	<b>20</b>
23	<b>Any other area of interest</b>	10	0	0	0	0	0	10	0	0	0	20	<b>27</b>

## Annex 6: Country Profiles

Tonga		Map			
Population	108,819 <sup>154</sup>				
Area (sq.km) or (sq. m.)	748 sq.km				
Total No. of islands	170 islands in four island groups, or regions				
Installed power generation capacity <sup>155</sup> (under one concession)	Island Group		Diesel (MW)	RE (MW) wind/solar	Grand Total (MW)
	Tongatapu		14.3	5.7	
	Vava'u		1.9	0.42	
	'Eua		0.79	0.2	
	Ha'apai		0.69	0.55	
	Total	17.68	6.87	24.55	
% of Total	72%	28%			
Generation mix					
Utility Customers	25,000+ <sup>156</sup>				
Access to electricity	100% of the population <sup>157</sup>				





<sup>154</sup> "Tonga Population." Worldometer.

<sup>155</sup> Tonga Power Limited. <https://www.tongapower.to/>

<sup>156</sup> Ibid.

<sup>157</sup> Source: Tonga Regulator

Nauru		Map <sup>158</sup>		
				
Population	10,985 <sup>159</sup>			
Area (sq.km) or (sq. m.)	8.1 sq. mi (21 sq. km) <sup>160</sup>			
Total No. of islands or island groups	1			
Installed power generation capacity <sup>161</sup>	Island Group	Diesel (MW)	RE (MW)	Grand Total (MW)
	Nauru			
	Total	13 MW	2 MW	15MW
Generation mix	% of Total	87%	13%	
Utility Customers	3,566 <sup>162</sup>			
Access to electricity	100% of the population <sup>163</sup>			

<sup>158</sup> "What are the Key Facts of Nauru?" Maps of World. <https://www.mapsofworld.com/answers/geography/what-are-the-key-facts-of-nauru/>


<sup>159</sup> "Nauru Population." Worldometer. <https://www.worldometers.info/world-population/nauru-population/>


<sup>160</sup> "What are the Key Facts of Nauru?" Maps of World.

<sup>161</sup> Nauru Utilities Corporation. <https://www.nuc.com.nr/nuc><sup>162</sup> Ibid.

<sup>162</sup> Ibid.

<sup>163</sup> "Access to Electricity (% of population)." The World Bank. <https://data.worldbank.org/indicator/EG.ELC.ACCS.ZS?locations=NR>

Niue					Map <sup>164</sup>	
Population	1,654 <sup>165</sup>					
Area (sq.km) or (sq. m.)	100 sq mi (260 sq km) <sup>166</sup>					
Total No. of islands or island groups	1					
Installed power generation capacity	Island Group	Diesel (MW)	RE (MW) solar	Grand Total (MW)		
Generation mix						
	Total	2 MW <sup>167</sup>	0.3MW	2.3MW		
	% of Total	87% <sup>168</sup>	13% <sup>169</sup>			
Utility Customers						
Access to electricity	100% of the population <sup>170</sup>					



The map displays the island of Niue, a small, irregularly shaped island in the Pacific Ocean. The island is green, with a network of yellow lines representing major roads and white lines for other roads. Key locations marked include ALOFI (the capital), Fuata, and several other towns like Mutalau, Makanga, Lakepa, Hio Beach, Tuapa, Makefu, Huihui, Tamakautoga, Avatele, and Hakupu. The map also shows the surrounding Pacific Ocean and a small inset map of the Pacific region. A legend in the bottom left corner identifies symbols for major roads, other roads, country capital, other city, major airport, and major sea port. A scale bar in the bottom center shows distances in miles (0 to 4) and kilometers (0 to 4). The copyright notice at the bottom right states 'Copyright © 2019 www.mapsofworld.com'.



<sup>164</sup> "What are the Key Facts of Niue?" Mpas of World. <https://www.mapsofworld.com/answers/geography/what-are-the-key-facts-of-niue/>

<sup>165</sup> "Niue Population." Worldometer. <https://www.worldometers.info/world-population/nue-population/>


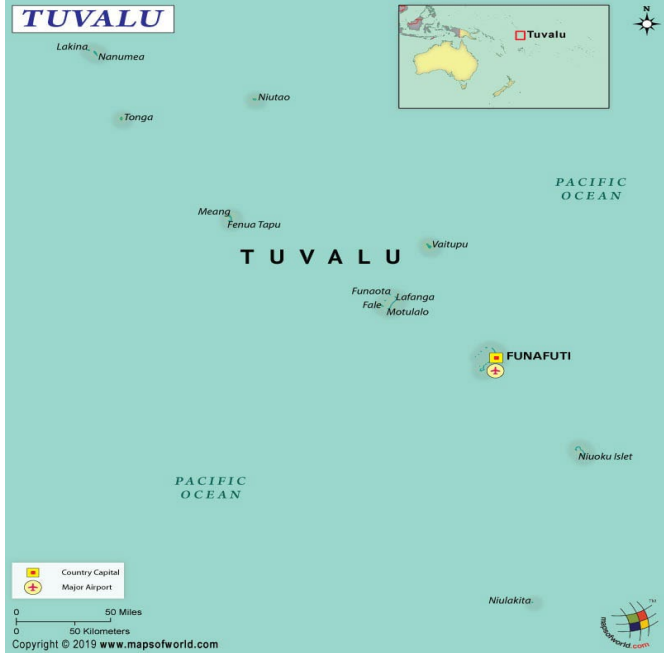
<sup>166</sup> "Niue." Britannica. <https://www.britannica.com/place/Niue>

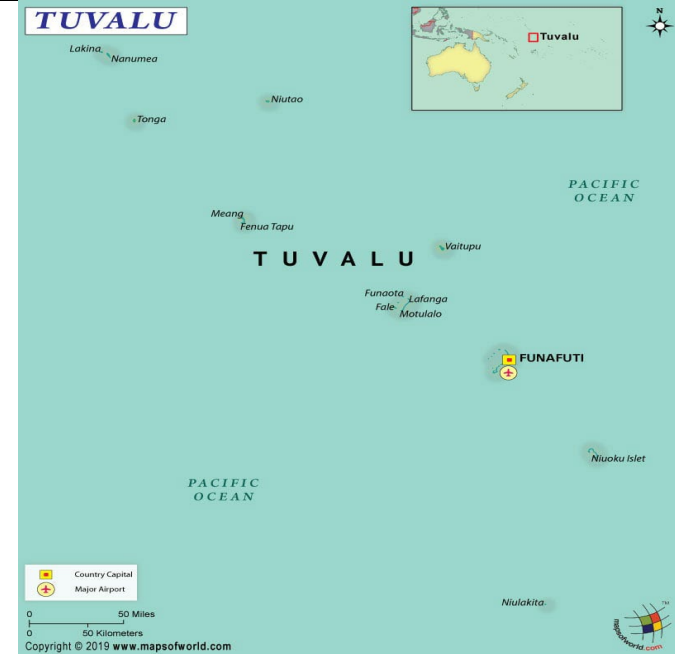
<sup>167</sup> "Niue Strategic Energy Roadmap 2016-2025." Government of Niue. <https://www.theprif.org/sites/default/files/2020-08/Niue%20Strategic%20Energy%20Road%20Map%202015-2025.pdf>

<sup>168</sup> "Niue Energy Profile." IRENA.

<sup>169</sup> Ibid.

<sup>170</sup> Ibid.

Tuvalu					Map <sup>171</sup>	
Population	12,141 <sup>172</sup>					
Area (sq.km) or (sq. m.)	10 sq. mi (26 sq. km) <sup>173</sup>					
Total No. of islands or island groups	9					
Installed power generation capacity <sup>174</sup>  Generation mix	Island Group	Diesel (MW)	RE (MW) wind/solar	Grand Total (MW)		
	Nanumea	0.160	0.195			
	Nanumaga	0.160	0.205			
	Niutao	0.160	0.230			
	Nui	0.180	0.080			
	Vaitupu	0.260	0.400			
	Nukufetau	0.180	0.097			
	Funafuti	1.8	0.726			
	Nukulaelae	0.114	0.045			
	Total	0.734MW	1.978MW	2.71MW		
% of Total	81%	19%				
Utility Customers	2.300					
Access to electricity	100% of the population					




<sup>171</sup> "What are the Key Facts of Tuvalu?" Maps of World. <https://www.mapsofworld.com/answers/geography/what-are-the-key-facts-of-tuvalu/>

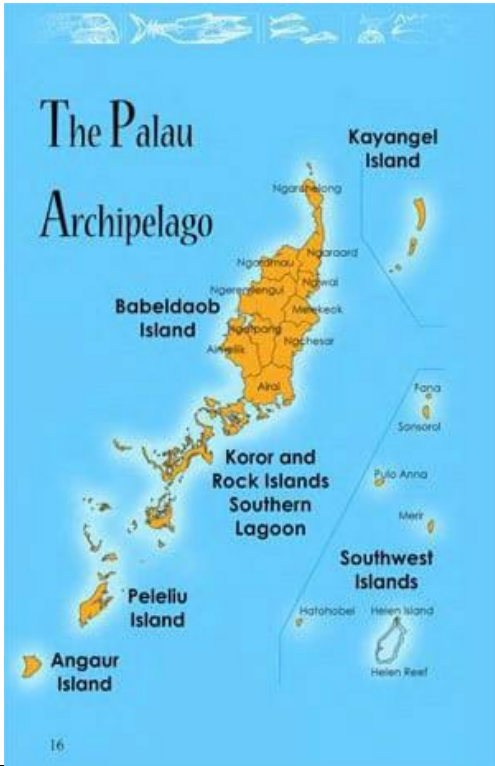
<sup>172</sup> "Tuvalu Population." Worldometer. <https://www.worldometers.info/world-population/tuvalu-population/>

<sup>173</sup> "What are the Key Facts of Tuvalu?" Maps of World.

<sup>174</sup> Source: Tuvalu utility



Palau					Map <sup>175</sup>
Population	18,297 <sup>176</sup>				
Area (sq.km) or (sq. m.)	458.4 sq. km <sup>177</sup>				
Total No. of islands or island groups	300+ islands or 16 island groups				
Installed power generation capacity <sup>178</sup> (under one concession)	Power System/ Utility	Diesel (MW)	RE (MW) solar	Grand Total (MW)	
	Koror-Babeldaob Power Plants	25.10 MW	N/A		
	Angaur Power Plant	KW Capacity = 502 KW	100 KW of PV		
	Peleliu Power Plant	KW Capacity = 1,193 KW	168 KW of PV		
	Kayangel Power Plant	KW Capacity = 310 KW	63 KW of PV		
	Total	27.1 MW	0.33 MW	27.4 MW	
	Generation mix	% of Total	99%	1%	
Utility Customers	12,388 (energy 7,206; water 5,182) [September 2022]				
Access to Electricity <sup>179</sup>	99.9% of the population 0.01% off-grid private systems				



The Palau Archipelago

Kayangel Island

Babeldaob Island

Koror and Rock Islands Southern Lagoon

Peleliu Island

Angaur Island

Southwest Islands

16


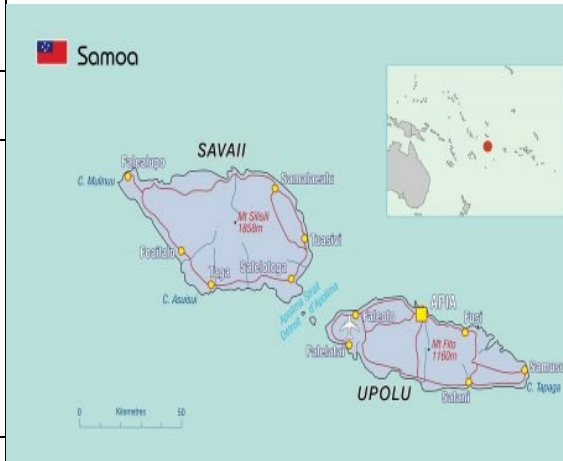
<sup>175</sup> "Palau." Britannica. <https://www.britannica.com/place/Palau>

<sup>176</sup> "Palau Population." Worldometers. <https://www.worldometers.info/world-population/palau-population/>

<sup>177</sup> "Palau Geography." CountryReports. <https://www.countryreports.org/country/Palau/geography.htm>

<sup>178</sup> Source: PPUC (Utility/SOE)

<sup>179</sup> Source: PEWA

Samoa					Map
Population	201,477 <sup>180</sup>				
Area (sq.km) or (sq. m.)	2,934 km <sup>181</sup>				
Total No. of islands	Four main islands and five small islands <sup>182</sup>				
Generation mix <sup>183</sup>		Installed Generation Renewable MW	Installed Generation Diesel MW	Installed Generation Total MW	
		23	27	50 <sup>184</sup>	
	Share (%) in total output	54%	46%		
Customers	41,656 <sup>185</sup>				
Access to electricity	99% of the population <sup>186</sup>				

<sup>180</sup> "Samoa Population." Worldometer. <https://www.worldometers.info/world-population/samoa-population/>

<sup>181</sup> "Samoa." Statistics for Development Division. <https://sdd.spc.int/ws>



<sup>182</sup> "Pathway for the Development of Samoa: FY2021/22 – FY 2025/26." Economic Policy and Planning Division. <https://www.mof.gov.ws/wp-content/uploads/2022/02/Pathway-for-the-Development-of-Samoa.pdf>

<sup>183</sup> Source: Samoa regulator

<sup>184</sup> "Samoa: Electricity Generation." Countryeconomy. <https://countryeconomy.com/energy-and-environment/electricity-generation/samoa>

<sup>185</sup> "Our Profile." EPC. <https://www.epc.ws/about-us/>

<sup>186</sup> Ibid.

Vanuatu						Map <sup>187</sup>
Population	324,834 <sup>188</sup>					
Area (sq.km) or (sq. m.)	4,706 sq. mi (12,189 sq. km) <sup>189</sup>					
Total No. of islands or island groups	83					
Installed power generation capacity <sup>190</sup>	Concession/Utility	Diesel (MW)	RE (MW) wind/solar	Grand Total (MW)	Utility Customer	
Generation mix	VUI (Santo Island)	3 MW	1.27 MW <sup>191</sup>	4.27 MW	4,679	
	VUI (Vanua Lava Island)	0.08MW	0	0.08 MW	107	
	VUI (Ambae island)	0.085MW	0.005 MW	0.09 MW	139	
	VUI (Maewo island)	0	0.080 MW	0.080 MW	235	
	UNELCO (Efate Island)	16.80 MW	10 MW <sup>192</sup>	26.66 MW	16,218	
	VNPF (Tanna Island)	0.98 MW	0.03 MW <sup>193</sup>	0.72 MW	1,514	
	VNPF (Malekula island)	0.86 MW	0.42 MW <sup>194</sup>	1.11 MW	1,218	
	Loltong Pico Hydro mini grid	0.01 MW	0.0096 MW	0.0196 MW	60	

<sup>187</sup> "What are the Key Facts of Vanuatu?" Maps of World. <https://www.mapsofworld.com/answers/geography/what-are-the-key-facts-of-vanuatu/#>

<sup>188</sup> "Vanuatu Population." Worldometer. <https://www.worldometers.info/world-population/vanuatu-population/>

<sup>189</sup> "What are the Key Facts of Vanuatu?" Maps of World.

<sup>190</sup> Source: Vanuatu regulator

<sup>191</sup> Breakdown: 1.20 MW hydro; 0.07 MW solar


<sup>192</sup> Breakdown: 2MW dual (other fuels); 3.40 MW wind; 1.69 MW solar; 0.77 MW solar IPP

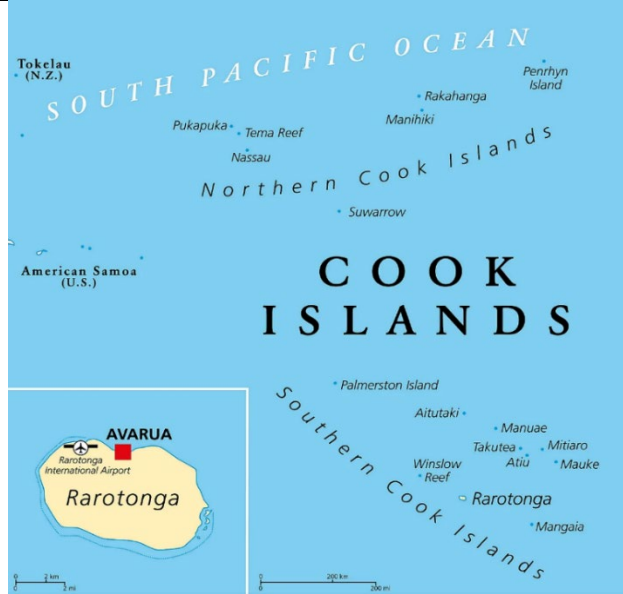
<sup>193</sup> Solar

<sup>194</sup> Breakdown: 0.02 MW solar; 0.4 MW hydro

	(Pentecost Island)					
	Electrical Cooperative Society - Wintua Lorlow communities- PV mini-grid (Malekula island)	0.03 MW	0.075 MW (0.075MWp) aggregated solar panel capacity)	0.105 MW	116	
	Total	21.85 MW	11.89 MW	33.74 MW		
	% of Total	64% <sup>195</sup>	36%			
Total Utility Customers (utility meters per household)	24,286 (Total households in Vanuatu 63,365 based on 2020 Census)					
Access to Electricity	38.3% of Vanuatu's total population is utility grid connected (excluding standalone home systems)					

<sup>195</sup> Based on more recent November 2021 - October 2022 figures on diesel fuel generation dependence. The initially provided figure (64%) seemed quite low. Port Vila's largest electricity market's dependence on diesel is over 90%. In this regard, the Vanuatu regulator has suggested considering installed capacity (MW) based on 81% diesel and 19% renewable energy (Source: Vanuatu regulator).

Cook Islands					Map <sup>196</sup>
Population	17,601 <sup>197</sup>				
Area (sq.km) or (sq. m.)	91.4 square mi. (236.7 square km) <sup>198</sup>				
Total No. of islands or island groups	15				
Installed power generation capacity	Utility/ Island Group	Diesel (MW)	RE (MW) hydro/ wind/solar	Grand Total (MW)	
	Te Mana Uira o Araura <sup>199</sup> (TMUA) - Aitutaki				
	Te Aponga Uira O Tumu-Te-Varovaro (TAU) - Raratonga	12.1 <sup>200</sup> (in Avatiu)	0.96 <sup>201</sup> (Solar in Avarua)	22.06	
	Pa Enua – North & Southern Outer Islands Governments				
	Any other utilities island(s)?				
	Total	X MW	Y MW	MW	
Generation mix					



<sup>196</sup> "Cook Islands." World Atlas. <https://www.worldatlas.com/maps/cook-islands>

<sup>197</sup> "Cook Islands Population." Worldometer. <https://www.worldometers.info/world-population/cook-islands-population/>

<sup>198</sup> "Cook Islands." Britannica. <https://www.britannica.com/place/Cook-Islands>

<sup>199</sup> Te Mana Uira O Araura (TMUA), formerly known as Aitutaki Power Supply, is a vertically- integrated state-owned enterprise responsible for the generation, distribution and retailing of electricity on Aitutaki.

<sup>200</sup> "Te Aponga Uira." Wikipedia. [https://en.wikipedia.org/wiki/Te\\_Aponga\\_Uira](https://en.wikipedia.org/wiki/Te_Aponga_Uira)


<sup>201</sup> Ibid.


	% of Total	65% <sup>202</sup>	35% <sup>203</sup>		
Utility Customers					
Access to electricity	100% of the population of the entire country, or by systems – TMUA, TAU, Pa Enua <sup>204</sup>				

<sup>202</sup> “Energy Profile: Cook Islands.” IRENA. [https://www.irena.org/IRENADocuments/Statistical\\_Profiles/Oceania/Cook%20Islands\\_Oceania\\_RE\\_SP.pdf](https://www.irena.org/IRENADocuments/Statistical_Profiles/Oceania/Cook%20Islands_Oceania_RE_SP.pdf)

<sup>203</sup> Ibid.

<sup>204</sup> Ibid.

Solomon Islands					Map <sup>205</sup>																																																												
Population		728,520 <sup>206</sup>																																																															
Area (sq.km) or (sq. m.)		28,450 sq km (10,985 sq mi) <sup>207</sup>																																																															
Total No. of islands or island groups		992 <sup>208</sup>																																																															
Installed power generation capacity <sup>209</sup>  (Honiara Grid & outstations)		<table><thead><tr><th>Utility/ Island Group/ Outstations</th><th>Diesel (MW)</th><th>RE (MW) hydro/wind/ solar</th><th>Grand Total (MW)</th></tr></thead><tbody><tr><td>Honiara</td><td>30.2</td><td>1.5</td><td></td></tr><tr><td>Lata</td><td>0.389</td><td>-</td><td></td></tr><tr><td>Kirakira</td><td>0.22</td><td>-</td><td></td></tr><tr><td>Auki</td><td>1.0</td><td>-</td><td></td></tr><tr><td>Malu'u</td><td>0.096</td><td>-</td><td></td></tr><tr><td>Tulagi</td><td>0.264</td><td>-</td><td></td></tr><tr><td>Buala</td><td>0.223</td><td>0.15</td><td></td></tr><tr><td>Seghe</td><td>0.132</td><td>0.15</td><td></td></tr><tr><td>Munda</td><td>0.28</td><td>1.0</td><td></td></tr><tr><td>Noro</td><td>1.5</td><td>-</td><td></td></tr><tr><td>Gizo</td><td>1.5</td><td>-</td><td></td></tr><tr><td>Taro</td><td>0.132</td><td>0.15</td><td></td></tr><tr><td>Total</td><td>35.9</td><td>2.95</td><td>38.85</td></tr><tr><td>%</td><td>92.4%</td><td>7.6%</td><td></td></tr></tbody></table>				Utility/ Island Group/ Outstations	Diesel (MW)	RE (MW) hydro/wind/ solar	Grand Total (MW)	Honiara	30.2	1.5		Lata	0.389	-		Kirakira	0.22	-		Auki	1.0	-		Malu'u	0.096	-		Tulagi	0.264	-		Buala	0.223	0.15		Seghe	0.132	0.15		Munda	0.28	1.0		Noro	1.5	-		Gizo	1.5	-		Taro	0.132	0.15		Total	35.9	2.95	38.85	%	92.4%	7.6%	
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<sup>205</sup> "Map of the Solomon Islands." Maps of World. <https://www.mapsofworld.com/answers/geography/what-are-the-key-facts-of-the-solomon-islands/attachment/map-of-solomon-islands/>


<sup>206</sup> "Solomon Islands Population." Worldometer. <https://www.worldometers.info/world-population/solomon-islands-population/>

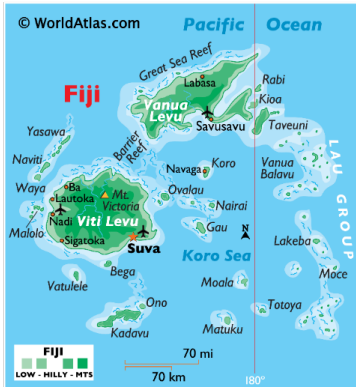
<sup>207</sup> "Solomon Islands – Location, size, and extent." Nation's Encyclopedia. <https://www.nationsencyclopedia.com/Asia-and-Oceania/Solomon-Islands-LOCATION-SIZE-AND-EXTENT.html>

<sup>208</sup> "About Solomon Islands." Solomon Islands Government. <https://solomons.gov.sb/about-solomon-islands/>

<sup>209</sup> "Solomon Power Projects and Capital Expansion Programme (2015-2019)." Solomon Power. <https://solomonpower.com.sb/projects/projects/>

Utility Customers		
Access to electricity	16% of the population <sup>210</sup>	

Fiji					Map <sup>211</sup>
Population	911,820 <sup>212</sup>				
Area (sq.km) or (sq. m.)	7,056 mi <sup>2</sup> <sup>213</sup> ; 18,275 <sup>214</sup> sq. km				
Total No. of islands or island groups	330				
Installed power generation capacity	Island Group	Thermal (MW)	RE (MW)	Grand Total (MW)	
Generation mix		194 <sup>215</sup>	199 <sup>216</sup>		
	Total	194	199	393	
	% of Total	49%	51%		
Utility Customers	210,320 <sup>217</sup>				
Access to electricity	100% of the population <sup>218</sup>				



<sup>210</sup> "Power Balance: Transitioning Solomon Islands from Diesel to Majority Renewable Energy by 2022." International Finance Corporation.

[https://www.ifc.org/wps/wcm/connect/news\\_ext\\_content/ifc\\_external\\_corporate\\_site/news+and+events/news/solomond+islands+renewable+energy](https://www.ifc.org/wps/wcm/connect/news_ext_content/ifc_external_corporate_site/news+and+events/news/solomond+islands+renewable+energy)

<sup>211</sup> "Maps of Fiji." World Atlas. <https://www.worldatlas.com/maps/fiji>

<sup>212</sup> "Fiji Population." Worldometer. <https://www.worldometers.info/world-population/fiji-population/>

<sup>213</sup> "Fiji Location." World Population Review. <https://worldpopulationreview.com/countries/fiji/location>

<sup>214</sup> Ibid.


<sup>215</sup> "Fiji – Electricity Generation." Countryeconomy.com. <https://countryeconomy.com/energy-and-environment/electricity-generation/fiji>


<sup>216</sup> Ibid.

<sup>217</sup> Chand, Anish. "2 per cent increase in EFL customers – Report." The Fiji Times.

<sup>218</sup> "Access to Electricity (% of population) – Fiji." The World Bank. <https://data.worldbank.org/indicator/EG.ELC.ACCS.ZS?locations=FJ>



PNG					MAP <sup>219</sup>
Population (PNG)		7,275,324 <sup>220</sup>			
Island Region Population		1,600,919 <sup>2</sup>			
Area (sq.km) or (sq. m.)		178,700 sq. mi (462,840 sq. km) <sup>221</sup>			
Total No. Island groups		600 <sup>222</sup>			
Generated power capacity	Utility/ Island Group	Diesel (MW) <sup>223</sup>	RE (MW) wind/solar	Grand Total (MW)	
	Manus Island	Lombrium 3.6 MW			
	New Island	Keviang 3.6 MW	Lihir 52.8 MW Geothermal Sohu Hydro 0.2MW		
	East New Britain	Ulagunan 7.6 MW Kerevat 7.2 MW Tokubar 3.9 MW	Gazelle Hydro 10 MW		
	West New Britain	Kimbe 4.3 MW Biala 0.5 MW	Ru Creek Hydro 0.8 MW Lake Hargy Hydro 1.5 MW		
	Bougainville	2.2 MW			
	Any other island(s)?	Daru 1.5 MW			
	Total	34.4 MW	71.7 MW		95.3 MW
		34.5 %	75.08%		100%



<sup>219</sup> “What are the Key Facts of Papua New Guinea?” Maps of World. <https://www.mapsofworld.com/answers/geography/what-are-the-key-facts-of-papua-new-guinea/>

<sup>220</sup> “Population Map of Papua New Guinea 2011 Census Final Figures.” National Statistical Office Papua New Guinea.

<sup>221</sup> “What are the Key Facts of Papua New Guinea?” Maps of World.

<sup>222</sup> “About PNG.” High Commission of the Independent State of Papua New Guinea. <https://pngcanberra.org/about-png/#:~:text=PNG%20consists%20of%20the,178%2C%20703%20square%20miles>

<sup>223</sup> Information in this column is sourced from: “Papua New Guinea: Power Sector Development Plan.” VisionRI Connexion Services Private Limited. <https://www.adb.org/sites/default/files/project-document/67187/40174-png-tacr.pdf>

Utility customers	1,096,543 <sup>224</sup> island region population
Access to electricity	13% of PNG has access to electricity, 142,551 population of the island region has access to electricity <sup>225</sup>

## Annex 7: Tariff Setting in Detail

Country	Available Tariff Guidelines/Methodology	Tariff Reviews Based on Cost of Service Studies	Tariff approach
<b>Fiji</b> FCCC	The regulator has published the electricity tariff framework online. The framework defines principles for determination of the tariff for Fijian consumers. Assistance is needed to develop guidelines/methodologies for grid-connected RE systems; off-grid systems, mini-grids, micro-grids; and charging stations for electric vehicles.	Tariff review should be based on cost of service, and submission should be supported with justifications to be considered by the regulator. There are tariff reviews every four years.	<ul style="list-style-type: none"> <li>Revenue requirement</li> <li>Building block methodology<sup>226</sup></li> <li>Price cap set for four years</li> <li>Intermediate/extraordinary adjustments</li> </ul>
<b>Palau</b>	The regulator has a set of	Yes, cost of service studies are covered	<ul style="list-style-type: none"> <li>All steps of cost of service regulation are applied.</li> </ul>

<sup>224</sup> "Population Map of Papua New Guinea 2011 Census Final Figures." National Statistical Office Papua New Guinea.

<sup>225</sup> National Energy Policy 2017 – 2027." Department of Petroleum and Energy. <https://policy.asiapacificenergy.org/sites/default/files/National%20Energy%20Policy%202017-2027.pdf>

<sup>226</sup> The building block method is a common method to determine the allowed cost. This method, which can be considered the standard method in tariff setting, consists of the following steps:

- **Cost categories ("building blocks")** are defined with the basic distinction being **opex and capex**
- **Capex** in turn consists of two sub-components namely **depreciation and return on capital**
- For each building block an annual projection is made for the regulatory period
- The sum of the blocks then defines **the required revenue per year**
- **The tariff is set such that the present values of the required revenue and the tariff revenue are equal.**

The key advantage of the building blocks method is that it provides for a modular approach whereby each cost item can be assessed separately.

<b>PEWA</b>	tariff guidelines developed in cooperation with the ADB. There are regulations in place for the setting of electricity tariffs as of 2020.	by the tariff guidelines. The ADB funded a cost-of-service study in 2020. The tariff guidelines foresee annual reviews, but there has not been a review since 2020 and it is unlikely that there will be another in 2022.	<ul style="list-style-type: none"> <li>• An automated fuel price adjustment clause (AFPAC) is applied quarterly.</li> <li>• The government imposed a moratorium on applying the AFPAC from April 2018 until the end of 2021.</li> </ul>
<b>Samoa</b> <b>OOTR</b>	<ul style="list-style-type: none"> <li>• There are electricity tariff guidelines and a methodology used by the Office of the Regulator to calculate and set the tariff.</li> <li>• There are guidelines for grid-connected RE systems (feed-in tariff policy), but the regulator is currently in the approval process of the off-grid and mini-grid guidelines.</li> <li>• No guidelines for charging stations for electric vehicles</li> </ul>	<ul style="list-style-type: none"> <li>• Within this three-year tariff period with intermediary annual reviews</li> <li>• The energy charge component of the tariff is reviewed monthly due to fluctuations in fuel costs and IPP costs.</li> </ul>	<p>The electricity tariff determination was initially based on a cost of service study in 2013. However, when the OOTR's Electricity Division was established in 2016, the Electricity Rules 2017 were implemented, which outline the tariff methodology for the Electricity Power Corporation (utility) to submit a multi-year tariff (three year forecast).</p> <p>Now the regulator applies a cost of service and multi-year tariff plan regulation. Within this three-year period, annual tariff reviews are conducted based on a proposal from the utility to consider factors affecting tariffs. The tariff consists of three components: the usage and debt charges (fixed costs) and the energy charge (variable cost). The energy charge component is reviewed monthly due to fluctuations in fuel costs and IPP costs.</p>
<b>Tonga</b> <b>TEC</b>	The regulator hired a consultant to assist in setting up the tariff formula in the concession contract.	<ul style="list-style-type: none"> <li>• Tariff review is every five years, based on a five-year regulatory (re-set) period</li> <li>• The non-fuel component is adjusted annually for inflation. The fuel/RE component is adjusted quarterly.</li> </ul>	<p>There are two components in the Tonga tariff. The non-fuel component of the tariff is to be set based on the building-blocks method and after that fixed as a price cap for the duration of the five-year regulatory period, with annual adjustments for inflation. The fuel/RE component is adjusted quarterly.</p> <p>Indicators:</p> <ul style="list-style-type: none"> <li>• Fuel efficiency – 4kWh/liter</li> </ul>

			<ul style="list-style-type: none"> <li>• Ceiling of level of losses, which can be compensated through tariffs as an incentive to reduce losses and keep savings <ul style="list-style-type: none"> <li>○ Fuel loss target (%)</li> <li>○ RE loss target (separate targets for within concession, and outside PPA) - % + actual spill/battery losses/year</li> </ul> </li> <li>• Customer service <ul style="list-style-type: none"> <li>○ Time of response to customer's claims, including meter reading, meter accuracy testing, and ensuring adequate voltage level</li> </ul> </li> </ul>
<b>Vanuatu</b>  Utility Regulatory Authority (URA)	The regulator has tariff review procedures and schedules in place.	<p>The regulator has tariff review procedures and schedules in place.</p> <p>The regulator plans to develop cost of service study capacity. A cost of service tariff setting methodology was undertaken for the two concessions (UNELCO Ltd and VUI) as a basis for the tariff reviews that were completed in June 2020 for UNELCO Ltd and in November 2020 for VUI.</p>	<p><i>Cost of service (i.e., revenue requirement, rate of return) regulation</i> There is no:</p> <ul style="list-style-type: none"> <li>• Separation of costs by function (i.e., generation, transmission, distribution etc.)</li> <li>• Classification of costs in terms of demand-, energy-, and customer-related costs</li> <li>• Rates are differentiated by levels of consumption</li> </ul> <p><i>Performance-based (incentive-based) regulation</i> According to URA's Electricity Reliability Standards, the specific performance targets and corresponding period are:</p> <ul style="list-style-type: none"> <li>• Minutes-off-supply, or the total minutes that a customer could expect to be without electricity over the reporting period</li> <li>• Interruption frequency, or the number of times that a customer could expect to experience supply interruptions in a year</li> <li>• Interruption duration, or the average time taken to restore supply to a customer when an interruption occurs</li> <li>• Momentary interruption frequency or the number of interruptions of less than three minutes that a customer could expect in a year</li> </ul>

			<p><i>Price cap</i> URA approved a maximum tariff (<math>P_0</math>): for individual concessions and cooperatives.</p>
<p><b>Nauru</b>  NUC</p>	<p>A tariff model should be available.</p>	<p>The last tariff reset occurred five years ago. The tariff remains unchanged. The recent tariff reset and review has yet to be implemented or endorsed by the government. There are no fuel adjustments made to the tariff.</p>	<p>The utility undertakes a tariff reset and cost of service study and submits them to the Cabinet for endorsement.</p>
<p><b>Tuvalu</b>  Tuvalu Electricity Corporation (TEC)</p>	<p>A tariff model is available.</p>	<p>Tariff studies have been conducted in previous years. The existing tariff was designed to be adjusted, but the Cabinet did not approve any adjustment.</p>	<p>The existing tariff is a differential model design to protect from price volatility and consists of two components: the base tariff – to be adjusted on yearly base; and the fuel tariff – to be adjusted on a quarterly basis depending on the fuel prices during the quarter.</p> <p>The TEC board has approved the model, but the Cabinet has not approved it. So, at present the tariff is under/below the economic rate TEC should be operating. The TEC differential type model consists of the following bands:</p> <ul style="list-style-type: none"> <li>• First 50kWh</li> <li>• Second 50kWh</li> <li>• Above 100kWh</li> <li>• Government and commercial (same rate as above 100kWh)</li> </ul> <p>The TEC monitors the following indicators:</p> <ul style="list-style-type: none"> <li>• Technical and non-technical loss</li> <li>• SAIDI and SAIFI</li> <li>• Penetration level of RE</li> </ul>

## **Annex 8: Highlights of RE and EE Policies and Incentives in PICs**

### **Highlights of Country Programs and Incentives Related to RE**

#### **Fiji**

- 20-year Development Plan
- Low Emission Development Strategy (LEDS) 2018 – 2050

#### **Palau**

- 2010 National Energy Policy

#### **Samoa**

- Energy Sector Plan 2017 – 2022
- Low Emission Strategy 2021 – 2030
- Pathway for the Development of Samoa FY 2021/22 – FY 2025/2026
- National Renewable Energy Policy 2022
- Samoa Nationally Determined Contribution

#### **Vanuatu**

- National Energy Roadmap 2016-2022
- National Sustainable Development Plan 2016-2030

#### **Nauru**

- Nauru Energy Roadmap

#### **Solomon Islands**

- Renewable Energy Roadmap for Honiara (main) grid of April 2021<sup>227</sup>
- Government has set a national RE ratio in the Renewable Energy Strategy and Investment Plan (RESIP) to 100% RE in the country by 2050

#### **Niue**

- Niue National Strategic Plan 2016-2026
- The Niue Strategic Energy Roadmap 2015-2025 (NSERM)
- Niue NDC

#### **PNG**

- The PNG Vision 2050 asserts that by the year 2050 PNG will be 100% powered by RE sources (National Energy Policy – 2017-2037)
- Key RE Policies are currently being developed (e.g., Geothermal Policy, Solar Policy, Hydro Policy, Ammonia Policy, Hydrogen Policy)

### **Key Regulatory Incentives for RE Development**

Regulators in the surveyed countries contribute to RE development in the following ways:

- Ensuring that tariffs account for investments in RE (i.e., Fiji)
  - Issuing RE licenses (i.e., Fiji, Samoa, Tuvalu's Utility – in the absence of a regulator)
  - Developing a policy for small-scale RE projects (i.e., Samoa)

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<sup>227</sup> Achieving RE targets in the Solomon Islands has been delayed and gradually postponed due to COVID-19 and delays with engineering, procurement, and construction (EPC) contractors. The utility SP is trying to split and accelerate EPC contracts with the World Bank's assistance and by undertaking part of the EPC work in-house.

- Developing grid codes, which will ease RE integration (i.e., Vanuatu, Nauru's, and Tuvalu's utilities in the absence of a regulator)
- Developing grid code for off-grid sites (i.e., Fiji)
- Establishing feed-in tariffs (i.e., Samoa, Nauru, Tuvalu)
- Publishing information on the utility website about available transmission and distribution capacity to ease RE integration (i.e., Tuvalu)
- Net Metering Act application (i.e., Palau)
- Definition/taxonomy of green financing (i.e., PNG)

### **Carbon Pricing and Emissions Trading**

Fiji's Climate Change Act 2021 stipulates the preparation of secondary legislation to promote:

- A carbon pricing mechanism including an emissions trading scheme
- Fees, charges, and fiscal incentives aimed at emissions reduction

### **Clean Cooking**

Clean fuels and technologies are those that attain the fine particulate matter (PM<sub>2.5</sub>) and carbon monoxide (CO) levels recommended in the WHO global air quality guidelines (2021)<sup>228</sup> and include solar, electric, biogas, natural gas, LPG, and alcohol fuels including ethanol.<sup>229</sup> Access to clean fuels and technologies for cooking reduces negative impacts on health from indoor pollution, which is considered a major health risk factor and cause of death in low-income households in developing countries. Access to clean fuels in the PICs' small countries was 32% in 2020.<sup>230</sup>

Clean cooking policies/standards in the surveyed countries are managed by other institutions outside of the regulators:

- Ministry of Commerce, Trade and Tourism (Standards Division) – Fiji
- Energy Division of the Ministry of Finance (MOF) and Ministry of National Resource & Environment (MNRE) – Samoa
- Public Health Department – Vanuatu
- The Department of Energy – Tuvalu

Fiji has reduced duties and taxes related to clean cooking products. Clean cooking in Fiji is linked to LPG products and the use of biogas and biomass for electricity generation.

### **Highlights of Energy Efficiencies Strategies, Legislation, and Incentives**

The surveyed countries have key national policy and strategy documents outlining EE targets in consideration of the SDG7 indicators, such as:

- Tonga Energy Road Map (TERM) 2010 – 2020, and Tonga Energy Road Map (TERM PLUS 2020-2035)
- Draft Tonga Energy Bill
- Vanuatu's National Energy Road Map 2016 – 2030
- Vanuatu's National Sustainable Development Plan 2016-2030
  - Environment Policy Objective 2.3 to 'promote renewable sources of energy and efficient energy use'
- Niue

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<sup>228</sup> "WHO global air quality guidelines: particulate matter (PM<sub>2.5</sub> and PM<sub>10</sub>), ozone, nitrogen dioxide, sulfur dioxide and carbon monoxide." World Health Organization. <https://www.who.int/publications/i/item/9789240034228>

<sup>229</sup> "Defining Clean Fuels and Technologies." World Health Organization. <https://www.who.int/tools/clean-household-energy-solutions-toolkit/module-7-defining-clean>

<sup>230</sup> "Access to clean fuels and technologies for cooking (% of population) – Pacific Island small states." The World Bank. <https://data.worldbank.org/indicator/EG.CFT.ACCS.ZS?locations=S2>

- National Strategic Plan 2016-2026
- Niue Strategic Energy Roadmap 2015-2025 (NSERM)
- NDC

They also have enabling legislation outlining energy management and performance standards, such as:

- Samoa's Energy Management Act 2020
- Vanuatu's Energy Efficiency of Electrical Appliances, Equipment and Lighting Products Act No. 24 and No. 26 of 2016 on standards and imports bans on energy inefficient products
- Tuvalu's Energy and Building Codes

### **Institutions**

As mentioned earlier, EE policies and regulations in the surveyed countries are managed by entities outside the energy regulators, such as:

- Fiji's Department of Energy and to a certain extent with the Ministry of Commerce, Trade, and Tourism (Standards Team)
- Vanuatu's Department of Energy
- Samoa's Ministry of Finance – Energy Policy Coordination and Management Division and Ministry of Natural Resources & Environment – Renewable Division

### **Policies and Standards**

The surveyed countries apply the following key EE policies and standards.

#### **Policies:**

- Consideration of potential of EE improvements in preparing PDPs (i.e., Fiji, Vanuatu, Tuvalu, PNG, Samoa)
- Implementation of demand side management programs (i.e., Samoa, Vanuatu)
- Energy conservation programs and TV campaigns (i.e., Fiji, Samoa)
- Installation of pre-payment meters (i.e., Tuvalu, Samoa)
- Conducting energy audits of buildings and industries
  - Available local auditors in Fiji, Samoa, Vanuatu, Tuvalu
  - Donor-funded energy audits in Nauru, no local capacity
- Tax exemptions on imports of EE appliances (i.e., the Solomon Islands)

#### **Standards**

- Minimum Energy Performance Standards and Labelling (MEPSL)
- Household appliances, air conditioning, lighting, TV (i.e., Fiji, Vanuatu, Samoa, Tuvalu)

### **Financing Mechanisms**

- National Green Energy Fund (NGEF) in Vanuatu: A revolving fund sourced from electricity grid customers, NGEF loan products, Vanuatu's government, and donor partners
- Green Financing in PNG: A green financing project aimed at enhancing, among others, green investments through the following outputs
  - Establishing a green investments taxonomy/definition in PNG with strong emphasis on financial inclusion
  - Preparing a diagnosis on the state of inclusive green finance in PNG
  - Preparing an implementation roadmap. (For green financing)<sup>231</sup>
  - The project is implemented through the Bank of PNG and PNG's CEFI<sup>232</sup>

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<sup>231</sup> "The Inclusive Green Finance Policy (IGFP) Project." The Centre for Excellence in Financial Inclusion. <https://www.thecefi.org/green-finance-policy/>

<sup>232</sup> The CEFI's vision, mission, and values focus on financial inclusion and literacy, poverty elimination and the promotion of



- The Development Bank of Tuvalu channels donor funds as loans for EE improvements, provided by:
  - The Low Carbon Fund
    - 1 to 2-year loans (\$200 to \$30,000) at a 3% interest rate to purchase
      - Home appliance, solar systems, and LED lighting
    - 25% rebate from purchase price if own funds used to purchase EE products under this program
  - EE Revolving Fund based on global environment facility support
    - One to three-year loans (\$100-\$80,000) at a 7% interest rate to purchase
    - Home appliances, solar water pumps, off-grid solar PV system
    - Efficiency home renovations
  - An EE rebate scheme funded by donors and administered by the utility of Nauru (see above for reference the rebate mechanism of the Development Bank of Tuvalu)

## Annex 9: Improving Access to Electricity

### Institutions and Strategies for Rural Electrification

Rural electrification is managed by various institutions in the surveyed countries:

- Rural Electrification Fund in Fiji
  - Funding from:
    - Development partners
    - Blended financing with the Green Climate Fund
    - Equity financing with private sector
- Departments of Energy (i.e., Tonga and Vanuatu)
- Utilities
  - Electricity Power Corporation (i.e., Samoa)
  - TEC (i.e., Tuvalu)
- In the Solomon Islands, rural electrification is managed by:
  - The utility (SP)
  - Ministry of Mines, Energy, and Rural Electrification
  - Ministry of Environment, Climate Change, Disaster Management, and Meteorology
  - A National Electrification Strategy of April 2022 includes a National Electrification Plan for the next 10 years
  - The government set a target to achieve 100% accessibility throughout the country by 2050
- In PNG, rural electrification is managed by the utility (PPL) together with provincial and district administrations.
  - A National Electrification Roll-Out Plan was prepared in 2017.

### Standards, Regulations, and Market Arrangements

Fiji's Electricity Act and Regulations and Tonga's Grid Code and new Energy Bill define connections procedures and standards in these countries. In Niue, connections of new development areas to the grid require a concentration of at least five to six homes in the area to justify connection. Using rooftop space on community centers is being considered to support electrification due to limited land on the island.<sup>233</sup> Standards for DG have been developed in PNG.<sup>234</sup>

Market arrangements for rural electrification include:

- Mini-grid operators can enter a PPA with the utility to sell power to the main grid (i.e., Fiji, PNG).<sup>235</sup>
- Similarly, distributed generators can sell surplus power to the network based on net metering and a PPA with the utility (i.e., Fiji).
- Also, in Vanuatu, mini-grid operators/owners can sell to concessionaires at a PPA tariff as agreed between the two parties and approved by the regulator.
- An Electrical Cooperative Society made up of two communities (i.e., Wintua and Lorlow) in Vanuatu operates a solar PV mini grid connecting homes and public buildings
- Local governments manage and operate their own power stations in the Cook Islands. Competitive tendering is mandatory in all cases of selecting investors in the power sector, including rural electrification.
- Willing buyer-willing seller agreements under PNG's off-grid regulation provide cost recovery.

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<sup>233</sup> Niue has a total population of 1,652 (Source: "Niue Population." Worldometer) and land area of 260 sq. km or 100 sq. miles (Source: "Niue Population." Worldometer.)

<sup>234</sup> The National Institute of Standards and Industrial Technology (NISIT) developed the Standards for Distributed Generation in consideration of relevant standards of Australia and New Zealand.

<sup>235</sup> Regulation ready to be gazetted (undergoing legislative vetting).

- In the Solomon Islands, there are grid extension programs for the capital Honiara and ten mini-grids (outstations) expanding within a new 15 km radius from existing generation facilities.
- The utility (SP) covers O&M and CAPEX of 0.415kV & 11kV lines with around ten local contractors that have been selected through a competitive procurement process.

### **Subsidies and Licenses in Rural Electrification**

- Fiji's government subsidizes connection costs to rural consumers.
- Net metering arrangements facilitate DG in Fiji and Samoa.
- The regulator issues licenses for DG in Fiji.
- In the Solomon Islands, within the utility (SP), revenue from customers in the capital Honiara cross-subsidizes the higher cost of mini-grids/outstations expansions in rural areas.
  - Also, there is no cost recovery through tariffs for mini grids implemented by the Ministry of Mines, Energy and Rural Electrification and the Ministry of Environment, Climate Change and Disaster in Solomon Islands.
- In PNG, the utility (PPL) currently relies on cross-subsidies by applying a uniform tariff to operate expensive diesel mini-grid systems. PPL has not, however, increased tariffs in recent years and its financial capacity is limited, which makes funding additional electrification projects difficult. The Electricity Industry Policy (EIP) envisages that future grid extensions to unprofitable areas will be funded through up-front subsidies and grid-specific tariffs. One key mechanism for the government to provide up-front subsidies is the national Community Service Obligation (CSO) framework. However, it has not yet been fully implemented and therefore no centralized funding is available at present. Similarly, the electricity trust fund envisaged by the EIP has not been established.<sup>236</sup>

### **Fees and Tariffs in Rural Electrification**

- Tonga's Ministry of Labor, Employment, Trade, and Development registers community groups providing maintenance of solar grids in small outer islands and regulates monthly maintenance fees collected from the community.
- Tonga is also working with the Green Climate Fund on a rural electrification model in the outer islands for defining off-grid connection costs and tariff mechanisms.
- The regulator reviews tariffs of off-grid supplier of electricity and allows recovery of full costs (i.e., Fiji).
- In the Cook Islands, local governments in the outer islands manage their own tariffs for electricity supply from their own power stations, which are the only power supply option on these islands. The local governments have an MOU with the main utility for technical support at the government's cost when required.
- In the Solomon Islands, the utility (SP) applies uniform tariffs cross its operations throughout the country.
- Vanuatu's regulator:
  - Defines tariffs for stand-alone mini grids
  - Factors grid extensions to rural areas in tariffs of regulated utility
  - Oversees QoS requirements

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<sup>236</sup> "Preparation of National Electrification Rollout Plan and Financing Prospectus, Final Report." The Earth Institute and Economic Consulting Associates. April 2017. pg. 7

## Annex I0: Survey Questionnaire



ASIAN DEVELOPMENT BANK



National  
Association of  
Regulatory  
Utility  
Commissioners

### **NARUC Energy Regulatory Survey Pacific Islands Countries (PIC-12),<sup>237</sup> PNG, and Fiji**

**Organization:** \_\_\_\_\_

**Prepared by:** \_\_\_\_\_

**Date Prepared:** \_\_\_\_\_

#### **Background**

This research project is being developed by the National Association of Regulatory Utility Commissioners (NARUC) in partnership with the ADB. The survey and ensuing report are under the auspices of the ADB project TA-9868 REG: Development of the Pacific Energy Regulators Alliance (53209-001). The survey will be administered via an online platform (SurveyMonkey) so that results are submitted electronically. Respondents will be able to pause/save the results as they go along so that the survey does not need to be completed in one session. Respondents are encouraged to use the Word version of the survey to collect information from colleagues to expedite the submission process.

#### **Purpose and Scope of the Survey**

Through this survey, NARUC is collecting data and information to prepare an assessment report to outline the status of the regulation of power sector utilities in the 12 PICs, PNG, and Fiji from the point of view of addressing the countries' key development challenges and facilitating actions toward the achievement of their strategic development objectives in terms of providing regulatory incentives for:

- Improving infrastructure resilience and the performance of electricity utilities to ensure sustainable and reliable electricity supply through proper tariff structuring, sound regulatory accounting and reporting, and adequate technology standards and licensing
- Developing RE and EE to reduce dependence on imported fuels for power generation and thereby reduce the cost of electricity supply and facilitate the achievement of emissions reductions and decarbonizations objectives
- Improving access to electricity through on-grid and off-grid electrification programs, including DERs
- Attracting private investment in the electricity sector through various forms of PPPs and IPPs
- Empowering women's participation in energy regulation, policy, and infrastructure development

The institutional soundness in terms of capacity, independence, and scope of regulatory mandate of

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<sup>237</sup> The PIC-12 comprise the Cook Islands, the Federated States of Micronesia (FSM), Kiribati, the Marshall Islands (RMI), Nauru, Niue, Palau, Samoa, the Solomon Islands, Tonga, Tuvalu, and Vanuatu. Niue is the newest ADB member, having joined in 2019.

the individual regulatory entities in the surveyed countries will be also assessed. Furthermore, this assessment report is expected to serve as a foundational document for OPERA as it moves toward increased operationalization.

### **Instructions**

Please use the space below each question to answer the questions (and immediate follow up sub-questions, as applicable). These spaces may be expanded to accommodate your answers. Where prompted, please place an X next to all criteria and “yes” or “no” answers that apply. Please provide as much detail as possible, and in the event the answer to a question is “no” please note that rather than skipping the question.

This written survey will be accompanied by a phone interview with respondents, who will have the opportunity to provide additional clarifying information verbally. Provided the respondents agree, we will record the phone interview to fully benefit from the additional information shared during the interview. Please kindly review this survey form and provide as much information as possible in writing in advance of this call.

For ease in navigating the survey, the questions are divided into the above-mentioned six categories of the survey’s scope in the following order:

- A. Institutional soundness – institutional capacity, independence, and scope of regulatory mandate**
- B. Improving the infrastructure resilience and the performance of the electricity utilities**
- C. Development of RE and EE**
- D. Improving access to electricity through on-grid and off-grid electrification programs, including DERs**
- E. Attracting private investments in the electricity sector through various forms of PPP and IPPs**
- F. Empowering women’s participation in energy regulation, policy, and infrastructure development**

We appreciate your time and look forward to learning more about your country’s power sector regulatory framework!

## SURVEY QUESTIONS

### A. Institutional soundness - institutional capacity, independence, and scope of regulatory mandate

1. Is there relevant legislation stipulating the regulator's mandate, organizational structure, and functions?<sup>238</sup> If so, please provide the name(s) of the corresponding legal acts and the specific regulatory topics they stipulate.

2. Is the legislation clear, in the opinion of the regulator, in defining the regulator's and/or other organizations' mandates, or are there ambiguities regarding jurisdictional responsibilities? Please explain.

3. Please indicate whether the following regulatory functions have been assigned to the regulator only, or to some other organizations as well, if applicable:

- Electricity tariff setting – economic regulation
- Technical regulation – developing and enforcing adopted technical standards
- Licensing of power sector entities
- Dispute resolution between licensees
- Review of national energy sector planning
- Definition of power market structure and monitoring anti-competitive behavior
- QoS – developing performance standards/indicators and enforcing compliance
- Consumer affairs – customer service, including complaints
- Stakeholder engagement – public relations

4. Please indicate whether the function of regulating power sector entities is combined with regulating other sectors, such as water, transport, and gas, within one regulator/organization.

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<sup>238</sup> Please also consider in your response any of the following additional regulatory topics as they might apply to defining the regulator's mandate: (a) the establishment and incorporation of a regulatory agency, (b) qualification, recruitment, and confirmation process for regulators, (c) eligible regulatory office expenses and their financing, (d) terms of office (tenure, payments) and termination of regulators, (e) power of the regulators, including summoning utility staff, recovery of information, examining witnesses, penalties for non-compliance with directives and review of decision making etc.

5. Does the regulator get consulted on policy decisions for the electricity sector, such as RE target setting, electricity access targets, or electricity tariff/subsidies? If yes, please provide examples.

6. Does the regulator have:

- Authority to set up and enforce rules and procedures, including final decisions on tariff setting, and licences issuance
- Autonomy in terms of independence and protection from pressure from the government, utilities, and the public when making decisions

In this regard, please clarify:

- Who appoints/selects the Chairman of the regulator, and for what period of time?
- Who appoints/selects the commissioners of the regulator? How many commissioners are there, and for what period of time are they appointed? Are their terms of appointment renewable?
- Does the tenure period of the regulator's Chairman and commissioners coincide or not with the tenure period of members of Parliament and the country's president? Is the Chairman's tenure period renewable?
- What is the mechanism of financing the daily operations of the regulator? Does the financing of the regulator require approval by or reporting financing needs and expenses to another organization?
- Please also describe any other mechanisms/pieces of legislation which ensure the regulator's autonomy and authority.

7. Is there a law or regulation formally:

- Preventing officials of the regulator from holding other offices within the government, public institutions with government appointees, and private sector within the energy sector during the tenure or employment with regulated utilities sometime after ending their tenure with the regulator (i.e., cooling off period)
- Preventing the appointment of Commissioners or the CEO/ Director General of the regulatory authority, if any of them has previously held a position in the regulated utility company
- Preventing the appointment of close family members (e.g., spouse, children etc.) to key positions in the government, public sector, and affiliates of private utilities/IPPs
- Stipulating a cooling off period after leaving a position with the regulator
- Stipulating a process to declare income and assets (both domestic and foreign) on a periodic basis when someone is appointed to a regulator's position and periodically thereafter

8. Is the regulator accountable to stakeholders through well-defined mechanisms for public participation in regulatory decisions and a dispute resolution mechanism? Is there a mechanism for the regulator(s) to collect and act on any public responses? Does the regulator have a media policy? Does the regulator publish an annual report on its activities? Is there a mechanism to appeal the regulator's decisions?

9. Is the regulator formally accountable to the county's president, prime minister, parliament, or another institution?

10. Please describe any other measures/mechanisms the regulator may apply to ensure open access to regulatory information, along with transparency and predictability of its decisions, such as:

- Providing information on regulatory consultations, inputs received, and decisions on the regulator's website to include historical decisions made
- Uploading information within a certain desirable timeframe (e.g., two weeks) after redactions, if any

11. Please describe the organizational structure of the regulator in terms of units/department experts covering key regulatory functions related to:

- Tariff setting and related monitoring and reporting of the regulated entities
- Licensing
- Enforcing technical and QoS standards
- Promoting RE and access
- Attracting private investments
- Public relations – stakeholder engagement
- Any other departments

12. Please describe the adequacy of staffing the regulator's units/departments in terms of:

- Availability of well-trained staff with strong institutional knowledge and expertise
  - Please provide the number of staff of the regulator and a general break down of regulator's staff qualifications (e.g., % of economists, % of lawyers, % of engineers, % financial experts, % of any professional backgrounds)



- Please clarify how the regulator is currently accessing expertise. Does the regulator use in-house skills only? Who does the regulator call for international expertise? Do development partners provide funding for consultants to support the regulators work?
- Does the regulator borrow staff from other government agencies (e.g., departments of finance and treasury)? Does the regulator have to put off reviews on occasion due to an insufficient number of staff?

- Mechanism of selecting and appointing staff and managers, and terms of appointments
- Availability of programs in the country's academic institutions with a focus on disciplines related to power sector regulation

13. Does the regulator have communications staff in place? If not, who is responsible for media engagement and public information and communications management?

14. Does the regulator have the capacity to enforce technical regulations and all other decisions/rulings made by the regulator? Please describe the mechanisms, if any, enabling the enforcement of the regulator's decisions/rulings, such as penalizing licensees through fees/holding them in contempt of regulatory decisions and delaying tariff increases/suspending licenses in a graduated manner.

15. Do the utilities provide draft regulatory decisions to the regulator on occasions when the regulator may be lightly resourced?

16. What are the regulator's training needs? In the table below, please rank the priorities on a scale from 1 to 10, 10 being the highest priority and 1 the lowest.

	Training Needs	Priority ranking
1	Basic knowledge in the electricity grid's operations	
2	Technical standards	
3	Basic economics of operating the power grid	
4	Tariff setting	

5	PPAs	
5	Legal powers of the regulator	
7	Function and objectives of the regulator	
8	Strategic planning of the power grid	
9	Power generation and transmission planning	
10	Economic evaluation of power generation and transmission projects	
11	Media engagement and public outreach	
	a/ Consumer affairs and handling complaints	
	b/ Intergovernmental relations	
12	Regulatory accounting and reporting	
13	EE	
14	Renewable portfolio standards	
15	Regulatory independence	
16	Feed-in tariffs	
17	Cost of service studies	
18	Utility finance	
19	Reverse auctions	
20	Integrated resource planning	
21	Power market development	
	a/Power markets design	
	b/Power market monitoring	
	c/Ancillary and balancing services	
	d/Unbundling	
	e/Utility business models	
22	Infrastructure reliability and service quality	
	a/Service quality, metering, and customer service	
	b/Grid code	
	c/Licensing of generation (incl. RE) and distribution facilities	
	d/Demand response/demand side management	
	e/DG	
	f/Resilience, disaster preparedness and mutual assistance	
	g/Cybersecurity	
23	Any other area of interest	

**B. Improving infrastructure resilience and the performance of the electricity utilities to ensure sustainable and reliable electricity supply through proper tariff structuring, sound regulatory accounting and reporting, and adequate technology standards and licensing**

**Mandate, Predictability, and Transparency in Electricity Tariff Setting**

- I. Does the mandate of the regulatory authority include economic regulation and setting up electricity tariffs? If the answer to the above question is “yes,” is the regulator the final decision maker on tariffs?
  - If the answer to the above question is “no,” please indicate which other agency has the mandate of setting electricity tariffs.
  - Is there a requirement in the tariff methodology or in another regulation for the utility to seek approval from the regulator prior to making major investments?

2. Are there a comprehensive set of electricity tariff guidelines and a methodology and a related model that are used by the regulator? Are they readily available to the public and how? If yes, are there separate tariff guidelines and methodologies for:

- Grid-connected RE systems
- Off-grid systems, mini-grids, micro-grids
- Charging stations for electric vehicles if any

3. Are there procedures and schedules in place for tariff reviews and cost of service studies? If yes, when were the last two tariff reviews and cost of service studies undertaken? Is there any specific time frequency established for carrying out tariff reviews and cost of service studies? Are such tariffs reviews and costs of service studies mandatory? Please describe the nature of the tariff reviews if they are not based on cost of service studies.

4. Are there any mechanisms in place for (i) public announcements in advance of upcoming electricity tariff increases and (ii) engaging with the public and utilities to discuss/clarify the rationale for the proposed tariff increase? Is there a mechanism for the regulator(s) to collect and act on any public responses related to proposed tariff increases? Are such mechanisms required by a law/regulation? Does the regulator have a website and if yes, what types of documents and information are published there?

### **Status of Applying Economic Regulation in Tariff Setting**

1. Please clarify to what extent any of the following key forms of economic regulation apply (Place an **X** next to all which apply):

- Cost of service (revenue requirement, rate of return) regulation
- Performance-based (incentive-based) regulation – the regulator sets performance targets for the regulated utilities, related to reliability (e.g. SAIDI, SAIFI), customer service (i.e., response time to complaints), loss reduction, etc.
- Multi-year rate plan – a form of incentive-based regulation where tariffs remain fixed for more than one year – up to three to five years – with adjustments for inflation and exchange rates, thus creating incentives to achieve cost efficiency (i.e., reduction) gains at a rate higher than the inflation rate to benefit the utility
- Price-cap regulation – a price cap is set beyond which the utility cannot charge higher tariffs. This creates an incentive to reduce costs to increase profit, but can also lead to deferring capital expenditures (i.e., under investment)
- Any other alternative forms of regulation

2. Please describe the details of the type of economic regulation that is currently applied.

- In case of performance-based regulation, please indicate specific performance targets and the corresponding time period
- In case of a multi-year rate plan, please indicate the period during which the tariff remains fixed
- In case of a price cap, please indicate the current level of the price cap in c/kWh or in national currency/kWh)

3. In the case of cost-of-service regulation, please clarify to what extent the key relevant steps are being applied in terms of:

- Definition of the revenue requirement of the utility
- Separation of costs by function (e.g., generation, transmission, distribution etc.)
- Classification of costs in terms of demand-, energy-, and customer-related
- Allocation of costs among customer classes (e.g., residential, commercial, industrial, etc.)
- Design of the electricity rates (recognizing costs and other rate-making decisions)

4. Please answer the following questions:

- Does the utility recover all its costs (e.g., investments, O&M, customer related costs such as metering, billing, connections) through tariffs?

- Has the regulator developed/validated a network connection policy (including the allocation of connection costs), and is it part of the tariff methodology or another document? Is the connection cost included in the tariff? Connection cost is meant to cover the capital cost of connection from customer premises to the network (distribution transformer or sub-station).

5. Are there mechanisms and specific formulas for tariffs indexation, adjustments (e.g., inflation, exchange rate, fuel prices), and if yes, how often are these applied? Are they mandatory?

6. Is the cost of ensuring adequate commercial and technical QoS standards factored in the end-user tariff? Do such commercial and technical QoS standards exist in the country? Are they incorporated in system planning?

7. Is there a tariff setting methodology designed to address reductions in allowable commercial and technical losses? Is there a threshold beyond which excessive commercial and technical losses are not allowed to be recovered through the tariff?

8. Are there regulatory mechanisms to compensate generators for the provision of firm capacity or other ancillary services (e.g., frequency or voltage control, spinning reserve)? Are these costs factored in the end-consumer tariff? Do technical regulations for ancillary services exist in the country?

9. Does the regulatory entity ensure utilities are compensated for the costs of stranded assets<sup>239</sup> (i.e., assets that have lost their value due to regulatory changes)?

10. Is there a mechanism for factoring the costs of mitigating social and environmental externalities in end-consumer tariffs? For example, these are costs related to reducing emissions from a coal power plant through additional filters at additional cost, or the cost of resettling people from a zone to be flooded by the reservoir of a new hydropower plan.

11. Is there a regulatory mechanism for disallowing expenses and/or grid investments (i.e., disallowing expenses or investments that are found by the regulator to be imprudent)?

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<sup>239</sup> A stranded asset is also an asset, a piece of equipment that once had value or produced income but no longer does, usually due to external change, including changes in technology, markets, and societal habits (Source: Makower, Joel. "The Growing Concern Over Stranded Assets." GreenBiz. <https://www.greenbiz.com/article/growing-concern-over-stranded-assets>)

12. Are there any subsidies in place in relation to electricity supply, and if yes, what is their source, mechanism of application, and treatment within the tariffs design process? Please provide the share of electricity subsidies from the budget as percentage (%) of the total government annual budget for the last five years.

### **Current Electricity Tariff Level Relative to Cost Recovery**

1. Please provide the current weighted average electricity tariff, or the weighted average electricity tariff for the most recent period available (in U.S. cents/kWh, or in national currency/kWh) and indicate the time period in which this tariff applies.
2. Please indicate what percentage of the full cost-reflective tariff<sup>240</sup> is covered by the weighted average electricity tariff, indicated in question 1 above.
3. Please provide (i) the actual average electricity tariff billed to end consumers and (ii) the corresponding full cost recovery weighted average electricity tariffs for the last five years. Please clarify the approach to weighting the average: e.g., using volume (kWh) by user class – residential, commercial, industrial, or some other approach (preferred in national currency/kWh or in U.S. cents/kWh as a second best option)

4. If current tariffs are below cost recovery level, please indicate which factor(s) contribute to the underpricing of electricity along the supply chain of (e.g., generation, transmission, distribution) such as (i) system losses<sup>241</sup> not recovered through the electricity tariff; (ii) a customer group paying at tariffs below cost (usually residential customers), (iii) the government's political decision not to increase tariffs for certain customer groups to cost recovery level, or (iv) any other factors.

5. Please clarify whether there is a mechanism for subsidizing the electricity consumption of vulnerable/low income consumers, including tariffs for vulnerable consumers below cost of supply.

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<sup>240</sup> A full cost-reflective tariff covers all related costs of power supply, including generation, transmission, distribution, metering and billing, and administrative overhead

<sup>241</sup> In relation to system losses, please consider any of the following:

1. Generation auxiliary losses, transmission losses, and distribution losses
2. Fuel adjustments or tariff resets not happening regularly
3. Addition of new infrastructure (GTD) that is not covered in tariff
4. Exit of large customers through net metering without cost recovery on stranded assets

6. What were the findings of the last tariff review and cost-of service study,<sup>242</sup> and were relevant follow up recommendations implemented? When was the cost of service study undertaken?

7. If current tariffs are below cost recovery level, is there a transitional path agreed between the regulator, the utility, and the government to achieve a cost-reflective tariff over time? If so, what are the key elements, milestones, and timeframe?

### Challenges in Moving Toward Cost-Reflective Tariffs

1. Please identify challenges in moving toward cost-reflective tariffs in terms of the following (place an X next to the challenges that apply and describe further in the space below):

- Institutions
- Legislation and regulations
- Capacity building needs
- Social or political consideration
- Inadequate data and reporting arrangements
- Very large investments needed for reliable power generation, system upgrades, and loss reduction
- Any other constraints

2. Please outline any possible solutions to the above constraints in the specific country/regional context.

### Regulatory Incentives for Investments in Enhancing Power Infrastructure Resilience

1. Is enhancing the resilience of power infrastructure among the stated policy goals of the regulator or addressed by the regulator with specific activities? If the answer is yes, which document defines such a policy/objective, and what would be the regulatory activities related to enhancing the resilience of power infrastructure?

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<sup>242</sup> In our approach, we consider cost of service studies based on defining revenue requirements for delivering electricity to all consumer categories in a power system regardless of the criteria according to which these consumer categories have been defined.

2. Are there stipulations under cost of service regulation to allow capital investments in infrastructure resilience to be recovered through electricity tariffs?

3. Are there any performance targets and utility incentives under performance-based regulation (PBR) to align utility performance with resilience goals? PBR includes multi-year rate plans, which cap the utility's annual revenue and provide incentives based on decoupling revenue from sales to mitigate utility resistance to resilience measures that do not lead to an increase in electricity sales.

Decoupling mechanisms provide utilities with stable revenues while making them financially indifferent to the implementation of EE programs and programs for DERs that reduce utility sales. A relevant example could be (i) investments in grid modernization to address QoS (voltage fluctuations) issues caused by the growth of DERs and related counterflows in distribution networks, and (ii) investments in grid modernization that could facilitate the integration of additional DERs.

4. Are there any regulatory decisions to facilitate lower cost utility financing for resilience investments through utility bond issues (i.e., securitization)? Securitization is a form of utility financing at a lower cost in comparison with equity and debt financing and may result in a lower cost of capital and reduced ratepayer burden.<sup>243</sup> Under securitization, funds are raised through a bond issue, which is repaid over time through charges applied to all ratepayers. The savings to ratepayers result from the lower borrowing costs achieved by securitizing the debt with a repayment guarantee. In many cases, this guarantee comes from legislative underwriting.

In other words, a utility can issue bonds at a lower cost with some form of municipal or state guarantee to mobilize financing to invest in enhancing the resilience of its network. If the utility chooses to borrow from a bank and then invest in resilience activities, it will more likely pay a higher interest rate compared with the lower payments the utility will have to make to the utility bond holders. The utility will make lower payments to the utility bond holders because utility bonds with a municipal or state guarantee are less risky than a credit from a bank.

5. Are there regulatory incentives for micro-grid development, including micro-grid tariffs, as a key instrument for improving energy resilience in communities?

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<sup>243</sup> In addition, securitization is the procedure where an issuer designs a marketable financial instrument by merging or pooling various financial assets into one group. The issuer then sells this group of repackaged assets to investors. Securitization offers opportunities for investors and frees up capital for originators, both of which promote liquidity in the marketplace. In securitization, the company holding the assets—known as the originator—gathers the data on the assets it would like to remove from its associated balance sheets. This gathered group of assets is now considered a reference portfolio. The originator then sells the portfolio to an issuer who will create tradable securities. Created securities represent a stake in the assets in the portfolio. Investors will buy the created securities for a specified rate of return (Source: "Securitization." Investopedia. <https://www.investopedia.com/terms/s/securitization.asp>).



6. Are there any considerations/criteria applied to resilience investments in the preparation and review of PDPs?

7. Are there any regulatory requirements for cybersecurity vulnerability assessments and recommending preventive measures?

### **Regulatory Accounting and Reporting**

1. Has the regulator developed a model regulatory accounting framework (i.e., an implementation of a Universal System of Accounts or other similar system) to ensure consistent and reliable time series data for use by a utility when filing a change in tariff application?

2. What reports does the regulator receive from the utilities? Is the regulator empowered to collect information from the regulated utilities in a mandatory/compulsory way?

3. Does the regulator carry out audits to verify the accuracy of the reports provided?

4. What performance indicators does the regulator use to assess the performance of the utility? Are there any specific resilience metrics such as:

- System “islandability” – the ability to operate segments of the power system in an “island mode” as mini-grids to ensure continuity of power supply in case of natural hazards
- Grid modernization with remote control capability and other features facilitating recovery from outages and preventing outages
- Reliability Indicators (e.g., SAIDI and SAIFI, etc.) adjusted to the resilience context with a focus on specific circuits, outage days, and vulnerable populations
- Completion of infrastructure vulnerability assessments and related staff training

5. How does the regulator balance between service level/quality performance and the financial performance of the utility? Does the regulator publish technical and financial performance assessment reports of the regulated utilities or require the utilities to publish one?

6. How does the regulator balance between the short-term and the long-term performance of the utility?

7. What are the implications for the utility when its performance obligations are not met?<sup>244</sup>

### Technology Standards and Licensing

1. Is the regulator directly responsible for the technical regulations of the utilities and industry? Does the regulator regulate the quality of electrical goods and equipment imported by the country?

2. What technical standards apply within the country?

3. Are there specific standards directly related to ensuring adequate power infrastructure resilience to natural hazards?

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<sup>244</sup> As an example, when a utility does not meet its performance obligations, regulatory penalties may have to be paid by the utility management (not recoverable through tariffs), an impact on license suspensions, delayed investment plan and tariff approvals etc.

4. What are the types of quality of service standards in use?

5. Are there penalties for non-compliance with established standards?

6. Is the regulator directly responsible for licensing new entrants in the power sector? If the answer is 'yes,' please clarify what type of entities are subject to licensing. If the answer is 'no,' please clarify which organization oversees licensing in the power sector. Are there established licensing procedures, guidelines, and what are the key licensing criteria?

7. Is there a mandatory bidding process for granting a license?

8. Are there standard licensing agreements, and if so, do such agreements cover generation, transmission and distribution, mini-grids, micro-grids, any other stand-alone power generation, and supply systems separately?

**C. Development of RE and EE to reduce dependence on imported fuels for power generation and thereby reduce cost of electricity supply and facilitate achievement of emissions reductions and decarbonizations objectives**

**SDG7 Targets**

- I. What are the national SDG7 Targets? What role does the regulator play in the achievement of the national SDG7 targets?

**Regulatory Incentives for RE Development**

- I. Is there a separate law/strategy/plan with goals for RE development?

2. Are there instruments incentivizing private investors to operate RE generation in the power sector (i.e., feed-in tariffs [FiT] capacity payments, green certificates, RE quotas, duties, and taxes exemptions, etc.)? In the case of FiTs, please clarify the source of subsidizing such tariffs, if applicable (i.e., subsidy for difference between the higher feed-in tariff paid to the supplier of RE and the lower [on occasion] tariff paid by end-consumers).

3. If renewable generators are receiving above-market prices from retail suppliers, has the regulator established a mechanism for the pass-through of these above-market prices? Is the additional cost spread across all electricity consumers or targeted to certain categories of electricity consumers?

4. Has the regulator developed different tariffs for different RE technologies and sizes of the generation plant?

5. Have there been or will there be any measures undertaken to adjust the Grid Code and the overall power system stability to facilitate the integration of new intermittent power generation based on RE resources?

6. Are there adequate capabilities to forecast the availability of intermittent sources of RE (e.g., solar, wind, tidal power)? If so, which agency is responsible for these forecasts?

7. What are the procedures for procuring/selecting (e.g., tenders, auctions, etc.) and contracting (e.g., IPPs, concessions, etc.) providers of RE? Is a schedule of future bids/auctions available to investors? Is competition used to ensure that large-scale renewables-based generation is cost-competitive?

8. Is there publicly available information about available transmission and distribution capacity to facilitate the integration of new generation capacity, including the consideration of smaller distributed solutions for islands? Please elaborate.

9. Is there access to emissions trading schemes through carbon pricing?

### **Regulatory Incentives for Clean Cooking**

1. Are there any regulatory incentives in place to facilitate the transition from charcoal and firewood to cleaner solutions based on LPG, biogas, and electricity, including solar cookstoves? Please include in the discussion (i) the availability of standards/technical specifications for cookstoves, and (ii) financial incentives such as subsidies, tax benefits, and duties exemptions.

2. Please indicate the institution involved in setting up clean cooking policies, standards, and relayed compliance monitoring and enforcement.

### **Regulatory Incentives for EE**

1. Are there separate laws, agencies, and programs for EE in the country? Which agencies are involved in EE activities?

2. Are there MEPS, energy labelling standards, and energy codes for buildings in place? If yes, please indicate the equipment and appliances covered by the MEPS and the labelling standards. Please also indicate the corresponding mechanisms of monitoring and compliance enforcement and the institutions involved in this process.

3. Is there local capacity for EE audits of buildings and industries?

4. Are there any incentives and financing mechanisms in place for EE activities, such as credit lines from local financial institutions, EE funds, energy service companies (ESCOs), green bonds, and others?

5. Are there any demand side management programs, energy savings programs, and EE programs and targets in place?

6. Is the potential for EE improvements factored into the preparation of electricity demand forecasts and PDPs?

**D. Improving access to electricity through on-grid and off-grid electrification programs, including DERs**

**Rural Electrification**

1. Is there a separate agency for rural electrification? If not, which agency handles matters related to rural electrification? Please also consider the electrification of islands that are typically smaller than the main island or distant from the main island.

2. Are there regulations for new connections of small generation capacity to extensions of the existing grid and related pricing?

3. Is there a mechanism for recovering the costs of rural electrification and related grid extensions through tariffs?

4. Are there regulations for tendering, contracting and operating generation in isolated systems, mini-grids, and cooperatives, along with related rules for pricing, new connections, and QoS requirements?

5. Are there regulatory policies that allow privately-owned mini-grid operators to sell mini-grid energy into the grid at a sustainable tariff? If yes, what tariff regime is allowed under the regulations for mini-grid operators? Please mark an **X** next to the applicable bullet and describe in the space below.

- Based on the market approach (buyer-seller agreement)
- Based on a detailed mini-grid tariff schedule issued by the regulator
- Based on the national average of end-user tariff
- Based on cost of service
- Any other regime
- None

## DERs

1. Are there technical standards for distributed renewable self-generation an end-user's own consumption in terms of procedures for:

- Feasibility analysis and defining allowed DG capacity in terms of aggregate capacity, capacity for each customer
- Application for and connection to the distribution network, operation, inspection, and maintenance of DG equipment
- Customers seeking recourse with the regulator if their application is denied
- Metering arrangements
- Arrangements to supply surplus power to the network
- Commercial assessments of the impact of the customer's exit (or reduced demand) before clearing the application including the impact on other customers and/or utility financials

2. Is there a methodology for setting tariff for surplus electricity supplied from DERs to the distribution network (i.e., net metering)? Is there a mechanism for bill credits for DER electricity supplied to the grid (i.e., the regular bill from the distribution company to the owner of DER is reduced by a credit for the electricity supplied back to the grid by the DER owner)?

3. Are there any regulatory incentives for electricity companies to enter renewable PPAs, including those with third-party DER aggregators?<sup>245</sup>

4. Are there any metrics within a PBR or any other form of regulation, related to:

- Procurement of grid services from DERs<sup>246</sup>
- Timeliness in interconnection of DERs

#### **E. Attracting private investments in the electricity sector through various forms of PPP and IPPs**

##### **PPP**

1. Is there a specific piece of legislation/regulation allowing PPPs in the power sector?

2. Is the regulator involved in preparing, monitoring, and enforcing PPP agreements (e.g., concessions, management contracts, etc.), and if so, under what specific conditions/procedures? Please also clarify if the regulator has a role in defining PPP contract violations and identifying related remedies.

3. Are there PPP transaction templates for utility regulation? If so, please outline the key PPP features/parameters included in the template.

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<sup>245</sup>A resource aggregator is a company that acts as an intermediary between electricity end-users, distributed energy resource providers, as well as power system participants that wish to exploit these services. Source: "Fundamentals and business model for resource aggregator of demand response in electricity markets, Volume 204," Science Direct. August 2020. <https://www.sciencedirect.com/science/article/pii/S0360544220309920>

<sup>246</sup> "Grid services include the services that a transmission system operator needs to procure to operate the transmission system. Such services constitute balancing services. The transmission license defines balancing services as: (a) ancillary services; (b) offers and bids made in the balancing mechanism; and (c) other services available to the licensee which serve to assist the licensee in coordinating and directing the flow of electricity onto and over the GB transmission system" Source: "Procurement Guidelines." National Grid Electricity System Operator. April 2022. <https://www.nationalgrideso.com/document/206771/download>



4. Are there any PPP transparency and disclosure standards in place? Please elaborate.

## PPAs

1. Are there tenders for PPAs? If so, who conducts such tenders?

2. Does the regulator approve PPAs, or is the regulator involved in the review and approval process for PPAs? This could include:

- Review of load forecast and supply stacking including pricing options before PPA tendering is taken up
- Review of draft PPA terms before tendering and after negotiations
- Review of the PPA price, arrived at based on a review of the tendering process and negotiations (including the acceptability of the price)

3. What is the price-setting mechanism for PPAs?

- Are there demand charges, energy charges, or other charges?
- Are there price adjustment clauses (e.g., inflation, fuel price variations, etc.)

4. Does the regulator approve the electricity price in PPAs?

5. Has the regulator established a mechanism for the pass-through of the PPA price spread across all electricity consumers or targeted to certain categories of electricity consumers?

6. Is there a standard form of PPAs? Place an **X** next to the answer below that applies.

- Yes
- No

## **F. Empowering women's participation in energy regulation, policy, and infrastructure development**

### **Participation of women in energy regulation and policy**

1. Please indicate the number of all employees/staff working at the regulator and the Ministry of Energy (men and women) and the number of women employees working at the regulator and the Ministry of Energy. Please also indicate the number of male/female/other staff at the administrative, junior, mid-, and senior career levels at the regulator and the Ministry of Energy.

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2. Please indicate the number of managers and heads of units/departments at the regulator and the Ministry of Energy, and how many of them are women. Are there any women among the commissioners of the regulator and the leadership of the Ministry of Energy?

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### **Participation of women in energy infrastructure development**

1. Are there any specific incentives to maximize women's employment opportunities in the energy sector? This could include quotas for women employees and managers; scholarships for women in academic studies related to the energy sector; internships for women at energy sector enterprises and institutions, including the regulator; and targeted capacity development and training programs for women related to energy sector development.

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2. Are there any specific laws, regulations, or Human Resources policies stipulating gender equity, equal employment opportunities, and equal pay for men and women related to government energy agencies and energy utilities (or in the country in general)?

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3. Are there women in the management/Boards of electricity utilities? If so, how many are there in each utility?

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4. What is the share (%) of women out of all employees working in each of the electricity utilities (i.e., generation, transmission, distribution)?

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5. Are there any local energy companies or franchisee enterprises owned by women?

6. Is there any specific differentiation/targeting of assistance for electricity consumption by women-owned businesses and households headed by women when designing social assistance programs and tariffs for electricity consumption by vulnerable/low-income households?

7. Are there any targeted initiatives to support women's entry as energy suppliers<sup>247</sup> in the RE market through microfinance, small and medium-sized enterprise financing, grants, and concessional loans; tax benefits; RE technology rebates; and measures and incentives to improve domestic banks' and financial institutions' risk perception and awareness of lending to women entrepreneurs for RE investments?<sup>248</sup>

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<sup>247</sup> Energy suppliers may include, among others, entrepreneurs that supply solar PV modules with related installation and maintenance services as well as energy efficient equipment and appliances.

<sup>248</sup> "Gender Toolkit: Going Beyond the Meter." Asian Development Bank, 2012. p. 28.

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