

VANUATU ENERGY TRANSITION RECOMMENDATIONS BASED ON BEST PRACTICES ON OTHER SIDS IN THE PACIFIC REGION



VANUATU

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This brief is the fourth-in-line contribution to mapping the renewable energy sources (RES) regulatory framework on the South Pacific Ocean archipelago of Vanuatu and providing policy recommendations, with a particular focus on electricity generation.

It builds upon the Onshore Renewable Energy Potential Introductory Brief (D01), the Legal and Regulatory Brief (D02) and the Regulatory Challenges Brief (D03). There are three regulatory challenges hampering a more effective uptake of renewable energy generation in Vanuatu were identified. These include:

- The non-effectiveness of the framework governing electricity utilities,
- The need for integrating a bespoke renewable energy regulatory framework beyond a project focus, and
- Several cost-based and pricing challenges.

This brief aims to propose preliminary policy recommendations to the identified regulatory challenges, based on comparative research using mostly governmental policies and good regulation practices from similar Small Island Developing States (SIDS) in the South Pacific. Island nations were selected due to their common geographical area, similar GPD level and comparable historical background as former colonial societies, contributing to similar constraints and regulatory barriers for their energy transition and nature protection. As a result, regulatory frameworks from the islands of Papua New Guinea, Tuvalu, Tonga, Fiji, Solomon Islands, Samoa, Kiribati, Niue, Marshall Islands and Nauru have been analyzed for this deliverable.

The [Islands, Nature & Renewable Energy Law Project \(INRELP\)](#) is a project of the IUCN World Commission on Environmental Law Climate Change Law Specialist Group. Working closely with island climate change and energy stakeholders INRELP develops policy recommendations with the goal of enhancing renewable energy, preserving nature, and engaging local island communities.

1. MORE EFFECTIVE REGULATION OF UTILITIES

The Utilities Regulatory Authority (URA) created in 2007 controls the electricity and water sectors and introduced a degree of public oversight of the country's electricity utilities in their respective concession areas.¹ However, the regulatory quality and transparency of the energy sector should still be enhanced in Vanuatu. The main problems identified and analyzed in the previous deliverable concern: (1) reviewing existing legislation and policies, (2) empowering the URA to more effectively control concession areas and enforce its decisions, and (3) streamlining the cooperation of regulatory agencies with overlapping portfolios in Vanuatu.

1.1. Review of Existing Legislation and Policies

The D02 legal and regulatory brief already identified that a review of existing legislation and policy is required, with a view to a clearer definition of the institutional authority of the URA and the Department of Energy (DoE) within Vanuatu's Ministry of Climate Change. It also recommended to define their respective responsibilities more accurately, to properly work towards targets included as part of Vanuatu's National Energy Road Map (NERM).

Further than this, other Pacific jurisdictions provide good practices. For instance, the Pacific Power Association (PPA) published in 2012 and 2017 an annual assessment of the Pacific electricity utilities' performance. These reports contain a data table on Pacific Utilities' key characteristics as well

as an electricity tariff table of Pacific Utilities.² This benchmarking process represented part of strategic development plans for the energy sector in Niue.³ The desirable review of existing legislation and policies in Vanuatu should incorporate a performance benchmarking of the three electricity concessionaires – Vanuatu Utilities and Infrastructure Ltd. (VUI), Union Électrique du Vanuatu (UNELCO) and the Vanuatu National Provident Fund (VNPF).

Another possible good practice comes from Papua New Guinea. A proposal is on the table to establish a National Energy Authority that will undertake all energy regulatory functions, encompassing both the economic and technical aspects.⁴ This may serve as a valid recommendation for Vanuatu.

A third option to consider is that there presently are no provisions in Vanuatu's law mandating utility-scale renewable energy generation. Although the generation of energy from renewable sources in grid-connected areas is performed by the three concessionaires, to date only 34% (11.6 MW) of Vanuatu's installed electricity generation capacity comes from renewable sources, translating in only about 24% (18.2 GWh) of the annual electricity production. In the Solomon Islands, a solar irradiation assessment identified the potential for utility-scale generation of electricity from solar power.⁵ Vanuatu, being similarly endowed with excellent potential for solar and wind power generation, should consider mandating electricity concessionaires to produce a certain minimum amount of electricity from solar power, wind power, or other renewable energy sources.

Finally, there is also the need to regularly review the set of incentives available within the regulatory framework, in response to market conditions and developments in the catalogue of potential investors into Vanuatu's renewable energy generation capacity. Niue has set as a priority to review its National Strategic Energy Policy and Action Plan and to provide more incentives to support and attract private sector participation in renewable energy and energy efficiency initiatives.⁶ In Vanuatu, this review should be conducted with respect to the Electricity Supply Act to test whether its provisions on electricity feed-in to the grid from private parties other than concessionaires is effective in permitting at least basic forms of active participation in electricity generation by grid-connected households, private companies and public institutions.

In Fiji, one of the key changes identified as necessary for the legal framework is removing conflicts of interests in regulation.⁷ Specifically, the

Fiji Electricity Authority (FEA) is a state-owned power utility that is empowered to supply electricity to consumers and ensure its own financial viability, while at the same time it has undertaken a regulatory role in developing the framework that governs the participation of the private sector in the power sector. Therefore, restructuring of the responsibilities for planning and regulation has been acknowledged as a fundamental priority.

In addition, with respect to establishing a favorable environment for renewables, several institutions in Fiji have a legal mandate to adjust their legal and regulatory framework in order to attract potential investors. For instance, the Ministry of Works, Transport and Public Utilities is empowered to issue policy instructions to FEA and establish the objectives that FEA is required to achieve in performing its tasks, while the Fiji Commerce Commission is authorized to determine price adjustments for regulated goods and services, including electricity and fossil fuels. While granting such mandates to different institutions in Vanuatu is not necessary in the short term, it is advised to assess the network of public and private stakeholders involved in the (re)drafting of laws and regulations relevant for the energy sector, in order to anticipate the balance of interests during the process.

1.2. Empowerment of the Utilities Regulatory Authority and Enforcement of its Decisions

In addition to the issues mentioned right before, Vanuatu also struggles to assert the URA's power and ensure the enforcement of its decisions vis-à-vis concessionaires to prevent abuse of market position.⁸ Such enforcement capacity is limited by several factors, analyzed below.

First, to both incentivize investment and maintain an effective oversight as Vanuatu's energy regulator, the URA should, in concord with government agencies of similar mandate such as the DoE, perform a comprehensive stocktake of the archipelago's renewable energy capacity and maintain an up-to-date database of renewable resource data, as well as any ongoing and prospective renewable energy projects. A definition of the quality and required range of renewable resource data should be carefully considered. This data should then be made publicly available, with the possibility of making more specific data available on a commercial basis, thereby providing a means of funding for this stocktake. A similar course of action was

recommended by the IRENA Renewable Readiness Assessment on neighboring Fiji.⁹

Second, with respect to any prospective review of power purchase agreement (PPA) guidelines, it may be useful to maintain and even expand the involvement of key potential buyers in PPAs, especially local communities, but also government buildings, industries and stakeholders in the tourism sector. For instance, the Marshall Islands considered that the risk associated with investment into an Ocean Thermal Energy Conversion (OTEC) plant on Kwajalein Atoll be hedged by concluding a long-term PPA with the United States Army, the prospective primary consumer of energy from such an OTEC plant, so as to provide a guarantee of return on investment.¹⁰ The long-term security of income provided to prospective investors by such a PPA could accelerate the uptake of renewable energy technologies also in off-grid, rural areas of Vanuatu, which are capital-constrained. In particular, the exploitation of the geothermal energy potential highlighted in rural areas of Efate, Vanua Lava, Tanna and Gaua islands could be realized in this way.

Moreover, the experience of Papua New Guinea also proves instructive for a longer-term evolution of the responsibilities of the URA. It is recommended that, as renewable energy generation becomes more mainstream in Vanuatu, both in concession and off-grid areas, a separate department is developed within the URA dealing specifically with renewable energy matters.¹¹ In Papua New Guinea, a separate regulatory agency exists for the regulation of the hydrocarbon industry. The Papuan Petroleum Resources Authority has the goal of maximizing commercial development of hydrocarbon resources within Papua New Guinea. Subordinate to the overarching Papuan energy regulator, this Authority allows for a more efficient allocation of resources in one area of energy regulation. The same organization could be adopted on Vanuatu for renewable energy sources. However, it is not necessary that an entirely new regulatory agency is created. Given the characteristics of the Vanuatu electricity market, even only a new department within the URA would suffice. This department would also coordinate the renewable energy policy with the DoE more generally.

Finally, regarding the inability of URA to implement and enforce its decisions, empowering URA vis-à-vis concessionaires is highly recommended. In this

context, the Nauru island's policy framework establishes extended reporting obligations for agencies and utilities to the regulatory authority for activities listed in the Climate Change Adaptation (CCA) and the Disaster Risk Reduction (DRR) priority actions, such as expanding the renewable energy capacity, reducing electricity demand, enhancing energy efficiency and renewable energy.¹² Specifically, 'monitoring and evaluation' responsibilities are considered critical tasks in the context of the Republic of Nauru Framework for Climate Change Adaptation and Disaster Risk Reduction (RONAdapt), consisting of sharing information across government and communities and analyzing what has been achieved in the previously-mentioned activities at community and national level.

1.3. Streamlining of Regulatory Portfolios

An identified regulatory barrier that is likely to impede the renewable energy penetration is the lack of collaboration between the various ministerial divisions handling overlapping portfolios. In Vanuatu, the Ministry of Climate Change and Natural Hazards, the DoE, the Project Management Unit, the National Advisory Board and the URA all have overlapping responsibilities in the energy sector and, without the adequate coordination, this is likely to lead to contradictory policies.¹³

A noteworthy development in the Pacific region for streamlining regulatory portfolios is the establishment of the Office of the Pacific Energy Regulatory Alliance (OPERA). It is a network comprised by the heads of the regulatory bodies of Samoa, Tonga, Vanuatu and the Secretariat of the Pacific Community (SPC), with the responsibility to promote the alignment of regulatory systems among members, enable Pacific regulators to access training, knowledge-sharing and capacity-building programs and encourage association and membership with regional and global regulatory organizations.¹⁴ However, OPERA has not been established as a legal entity, but rather as a network bringing together the energy regulators and facilitating information-sharing in the Pacific area. Thus, the creation of a centralized body similar to the OPERA, based on inter-ministerial collaboration within Vanuatu's national context could be beneficial for the policy coordination and the acceleration of renewable energy projects.

At national level, the Cook Islands are promoting improved coordination among the institutions involved in the energy sector by enabling efficient and effective planning, increased transparency and building support amongst agencies.¹⁵ Similarly, Tonga's policy framework targets full coordination across relevant government ministries, with all ministries having actionable plans that incorporate the objectives of achieving sustainability in the region.¹⁶ On the other hand, Fiji, Kiribati, Marshall Islands, Solomon Islands and Samoa have all established a centralized body – usually a committee or an agency – that coordinates renewable energy deployment and key stakeholders' initiatives, oversees the development of programs and projects, reviews any national design standards for renewable energy installations and develops training programs.

Another good practice identified, which may facilitate inter-ministerial communication and the coordination of renewable energy policies to avoid redundancies in Vanuatu, is the creation of a central platform accessible by various stakeholders and enabling them to exchange information. More specifically, such a practice has been developed in the Cook Islands and includes the development of a national forum in which various stakeholders involved in the energy sector have the opportunity to collaborate by sharing data and to align their efforts towards common action plans. The aim is to advance the nation's sustainability goals and effectively implement renewable energy targets, ensuring a unified direction at national level.

A comparable approach is observed in Samoa, where a central database that contains information about all the ongoing RES projects as well as energy projects under consideration for future implementation was established.¹⁷ This database ensures that all relevant information is easily accessible and readily available throughout the sector. Finally, in Fiji, the establishment of a data repository has also been suggested, in order to remove the barrier of lack of information or overcome the risk of information asymmetry to private sector and other relevant project developers.¹⁸

Overall, the solutions and good practices identified on different Pacific islands to streamline regulatory portfolios are twofold. They either promote the adoption of an effective inter-ministerial planning

approach, aiming to establish a coherent policy framework for the coordination of the institutional bodies through transparency and integrated arrangements, or they support the integration of common portfolios into a distinct and centralized regulatory body or agency, responsible to formulate energy policies and oversee their implementation.

2. Integrated Renewable Energy Regulatory Framework Beyond a Project Focus

It is made clear in D01 that Vanuatu is divided into grid-connected areas, governed by concession contracts, and off-grid rural areas, where individual energy projects, such as the Vanuatu Rural Electrification Project (VREP) I and II, take place in order to increase electrification.

In this deliverable we recommend a general integration of the overall renewable energy regulatory framework. Five key aspects should be considered: (1) streamlining and unifying regulatory requirements from multiple regulatory bodies, (2) developing a general renewable energy regulatory regime beyond a project-basis, (3) enforcing safety and technical standards, (4) initiating skilled local labor provisions, and (5) implementing environmental impact assessment mandates.

2.1. Unifying Regulatory Requirements of Multiple Regulatory Bodies

With the aim of accelerating renewable energy projects and encouraging investments in the energy field, Vanuatu should streamline the various regulatory requirements that are currently in place and create a coherent regulatory regime for renewables beyond a project-basis. For instance, in Fiji, an online platform will be developed where all the government services will be accommodated.¹⁹ There, activities such as licensing processes and approval, business registrations, land use administration and taxation will all take place online, streamlining the regulatory requirements and avoiding time-consuming processes.

Another option is provided by Papua New Guinea, where, besides drafting new legislation, the country is regulating specifically for and incentivizing the uptake of renewable energy sources.²⁰ Furthermore, it is understood that all institutional arrangements of the energy sector need to be optimized and streamlined under one competent authority, in order to achieve 'efficiency,

access and affordability'.²¹ As such, this sector will be coordinated by one competent authority. Consequently, all circumstances and conditions related to the implementation of a specific energy project, encompassing both economic and technical aspects, will be consolidated and overseen by a proposed Electricity Regulatory Commission, responsible for ensuring efficiency, facilitating access and promoting affordability.

2.2. Development of a Bespoke Renewable Energy Regulatory Regime Beyond a Project-Basis.

It is of crucial importance for Vanuatu to establish a coherent framework facilitating renewable energy penetration. Such a framework should establish a clear regime for renewable energy based PPAs between Independent Power Producers (IPPs) and the Utilities and incentivize renewable energy uptake, through instruments such as net metering and tax and duty exemptions. The practice identified in Papua New Guinea is instructive in this respect. First and foremost, the country's National Renewable Energy Development plan admits that, while engaging in project-specific activities can yield quick results, this policy may encounter difficulties for long-term sustainability if not integrated into wider government planning and financing procedures.²² In this direction, Papua New Guinea established in the National Energy Policy that the tariff rate should account for the recovery of costs.²³ It is also acknowledged that the capital intensiveness of the energy industry makes it crucial to attract investments for various activities, including exploration, generation, transmission and distribution of energy. Therefore, long-term funding alternatives that draw on both international and domestic financial resources are needed.

2.3. Enforcement of Safety and Technical Standards

The absence of clear safety and quality standards has been identified as a key barrier to the adoption of renewable energy technologies.²⁴ First, it is important to determine which renewable energy standards and design guidelines are needed for off-grid and on-grid installations respectively. Such standards should be monitored and enforced by one regulatory body. In Papua New Guinea, the National Energy Plan promotes the formulation and enforcement of minimum standards for solar energy technologies.²⁵ In Tuvalu, the semi-public Tuvalu Electricity Corporation imposed specific technical standards consistent with the country's Renewable Energy & Energy Efficient Master Plan,

available for public scrutiny.²⁶ A similar policy could also be implemented in Vanuatu, where URA could adopt and enforce relevant technical standards for all renewable energy installations. Additionally, in Fiji, technical support is offered to all new installations, under the DoE program, in order to ensure the adequacy with grid functioning rules of the energy supply.²⁷ In Kiribati, in order to ensure the technical quality of renewable energy projects, their appropriateness for the island environment and their safe integration into the grid, the development of specific standards and guidelines is also considered necessary.²⁸

Besides safety and technical standards, the Marshall Islands promote the idea of initiating specific design standards consistent with international practices, in order to level the playing field for private investors.²⁹ Such considerations may address specific requirements for different types of renewable energy technologies, including requirements for minimum maintenance, spare part stocks and installer and maintenance staff training, and are also important to ensure the adequate quality and capacity for a reliable and efficient operation of the installations.

2.4. Skilled Local Labour Provisions

An additional significant barrier that is likely to impede the uptake of renewables in the Vanuatu archipelago is the lack of indigenous technical workforce, the lack of expertise to contribute to the construction, operation and maintenance of the renewable installations, as well as the lack of specialized workers employed by the utilities.

The significance of local know-how is identified in the majority of the Pacific islands. Firstly, the Marshall and Solomon Islands as well as Fiji are encouraging the adequate education of locals. The first one targets the collaboration with the College of the Marshall Islands and the University of the South Pacific in providing courses in installation and Operations and Maintenance (O&M) process for standard modular mini-grids. Other initiatives support the education of engineers through targeted programs, aiming to enhance the skills required for the operation of renewable energy technologies.³⁰ The Government of Fiji also plans to collaborate closely with the private sector, offering practical training and mandatory certification to those participating in such programs and also organizes to provide training to the existing technical staff.³¹

Moreover, the establishment and the frequent review of key performance indicators and job

descriptions applied to the permanent secretaries in all the Ministries, aims to create highly-skilled domestic labor.³² In its National Energy Policy, Papua New Guinea also aims to enhance the institutional capacity and recruit adequately trained workers, in order to ensure that the energy sector is increasingly equipped with relevant specialist skills to support the integration of renewables.³³ In Tuvalu, the creation of a knowledge base for all available renewable energy sources and technologies is promoted, aiming to develop local expertise in the installation, operation, technical and economic management of renewable energy systems. Thus, initiating programs for educational and practical training could be a valuable solution for Vanuatu, in order to upskill its local workforce in renewable energy sources and be able to contribute effectively to installing, operating and maintaining renewable technologies.

2.5. Mandating Environmental Impact Assessment for Proposed RES Developments

D03 stressed the need to conduct an Environmental Impact Assessment (EIA) before proceeding with installing and operating any renewable energy technology. It also emphasized the requirement to overcome the contradictions in Vanuatu's legal framework, especially the provisions of the Environmental Management and Conservation Act and the Environmental Impact Assessment Regulations 2011, with the latter exempting the construction of solar energy facilities from the need to conduct a preliminary EIA. Renewable energy projects, wind or solar farms for example, can lead to negative effects on the environment, despite the generation of clean energy. Henceforth, it is important to consider an EIA necessary for renewable energy technologies above a specific size threshold (measured in number and/or height of wind turbines, or above a certain area of land covered with solar panels, etc.). D03 also mentioned the need to conduct a social and cultural impact assessment, along with the EIA, since renewable energy projects may have a significant impact on local communities, their cultural practices and social structures.

In this sense, Papua New Guinea, the Cook Islands and Tonga explicitly acknowledge the need to implement EIAs for major projects and to create an enabling environment through establishing adequate governance and effective monitoring and management of such procedures.³⁴ However, more drastic solutions are being proposed by Nauru, which established an EIA Committee to monitor 'substantial development projects', including the energy generation installations. More

specifically, this Committee is required to assess project briefs, EIAs and environmental management plans, approve or refuse any applications, providing reasonable written reasons, reviewing applications for entry to and utilization of genetic resources and biodiversity and finally conducting any required public consultation regarding a significant project.³⁵ Such an initiative could prove useful to Vanuatu.

It is to be noted that other Pacific Island States have a similar provision as Vanuatu's EIA exemption for solar installations. However, in Niue's Joint National Action Plan for Disaster Risk Management and Climate Change, this exemption is acknowledged as a problem and it is suggested to develop a guidebook for managing an integrated implementation of the EIA regulation, condensing all the requirements and aiming at coherence and consistency.³⁶ Finally, Fiji provides in its Climate Change Act 2021 for conducting not only an EIA but also a social impact assessment for RES projects.³⁷

3. Cost-based and Pricing Challenges

As discussed in the previous Deliverables, Vanuatu's government has contracted private operators for electricity generation and distribution. However, the ambitious aim of achieving 100% renewable energy by 2030, coupled with a small customer base, may lead to price increases and widespread affordability issues. Addressing cost-based challenges requires tackling specific regulatory issues, such as 1) ensuring long-term affordability of electricity supply, 2) managing grid-extension costs, 3) developing a bespoke legislation for operational support, and 4) guaranteeing investor's income.

3.1. Securing Long-Term Affordability of Electricity Supply

In order to secure the affordability of electricity prices over the long-term, other Pacific islands have initiated three main policies, namely the promotion of renewables for electricity generation, the enhancement of energy efficiency and competition in the energy sector. First of all, Tuvalu prioritized to substitute its high dependency on costly imported fossil fuels with local renewable energy supply with the aim to strengthen the cost-effectiveness, availability and reliability of the electricity supply.³⁸ Energy efficiency also constitutes an integral part of the affordability policy, since it can result in a decreased demand for new generation capacity and therefore contribute to reducing both capital and operational expenses. According to the Master Plan for

Renewable Electricity and Energy Efficiency in Tuvalu, energy efficiency measures are expected to yield favorable cost-benefit outcomes and ensure the affordability of electricity for the people of Tuvalu.³⁹ To achieve these objectives, a review and development of a tailor-made legislation was promoted.⁴⁰

The enhancement of competition in the energy sector is also considered a means of achieving the long-term affordability of the electricity prices. To increase competition, economic incentives and implementing third-party access (TPA) are classic options. Regarding the former, in Fiji and Kiribati, the establishment of a favorable tax regime aims to promote investments by the private sector, strengthen competition and a greater customer participation through renewable energy technologies.⁴¹ Similarly, Papua New Guinea aims to provide tax and duty incentives for the involvement of the private sector in the energy market, additionally introducing net and smart metering policies to encourage a competitive electricity market environment through the expansion of independent power production and distribution.⁴² Finally, Papua New Guinea's policy documents provide that the government will maintain its regulatory role in retail competition, ensuring fair pricing and market ownership in the energy industry. It will also implement lower tariffs for rural electricity users based on the Long Run Marginal Cost (LRMC) principle. Many of these incentives were already mentioned above and may be of interest to Vanuatu to ensure affordability of electricity. Yet, the LRMC principle may represent a targeted, fairness-oriented instrument particularly adapted to its situation, acknowledging the different economic conditions and challenges faced by rural electricity users.

Regarding the TPA, given the relatively advanced state of Vanuatu's electricity market, URA may consider reviewing existing TPA legislation applicable to concession areas. TPA refers to the right for an undertaking operating in the energy sector to receive fair and non-discriminatory access to utilize the energy infrastructure owned by network operators. In case of a TPA reform, URA should ensure it allows households and other small-scale stakeholders (including government buildings, schools and hospitals) to supply electricity they produce in excess of that which is needed for their own consumption to other consumers by using the grid. Such an approach would facilitate a bottom-up diversification of the

electricity production mix in concession areas. In this regard, the experience of Papua New Guinea is instructive.

On this basis, it is advised to consider including mandatory TPA in any future PPA that is signed, and amending the PPA guidelines to this end, aside from possibly also developing bespoke legislation targeting TPA of small-scale active consumers.⁴³ Papua New Guinea has also established a framework for enabling TPA to the transmission grid. Specifically, it has implemented a TPA Code, in which the following elements are regulated: a) Reference Prices, which will establish the highest price a regulated retailer will pay for electricity generation; b) Wheeling Arrangements, which will define the terms and fees for TPA to Papua New Guinea's transmission network; and c) Connection arrangements, which outline the conditions and charges for connecting to the transmission network.⁴⁴ The implementation of the TPA Code enhances transparency in PPAs between IPPs and regulated retailers, prevents regulated retailers from engaging in unfair discrimination against potential competitors, safeguards commercial interests by providing transparency on their remuneration when third parties connect to and transmit power through their networks and finally prevents unfair discrimination by Transmission System Operator against third parties.⁴⁵ In order to safeguard TPA to the network and, thus, competition in the energy market, Vanuatu could also follow this example and establish a TPA Code.

Furthermore, Fiji identifies that domestic renewable energy, namely hydropower and non-hydro renewables, is considered essential to secure a sustainable, affordable and reliable energy supply.⁴⁶ Scaling up domestic renewable resources could increase affordability and enhance security of supply, economic growth particularly in rural areas. Overall, following the policies implemented in other Pacific islands and pursuing long-term affordability in electricity prices and improvement of the access to and reliability of the energy supply, Vanuatu should minimize the dependency on costly imported fossil-fuels' based generation, incentivize investments of the private sector in the electricity system, encourage energy efficiency and remove the barriers to TPA.

3.2. High Marginal Costs of Grid-Extension Beyond Urban Areas

Due to the geographical circumstances of Vanuatu, consisting of dispersed islands and with low customer density in rural areas, the need for extension of grid infrastructure is high, but the marginal costs of providing access beyond urban areas increase significantly. The least cost approach to overcome such a barrier would be to incentivize distributed generation and off-grid solutions, such as microgrids.⁴⁷ These technologies could help bypass the need for extensive grid-extension. Kiribati has designed a Rural Electrification Implementation Plan to improve and expand solar energy systems for rural households and communal buildings.⁴⁸ This plan is based on comprehensive surveys that monitor not only the energy needs of the rural population and households, but also the willingness and capacity of these residents to afford these services in order to meet their needs.

3.3. Bespoke Legislation for Operational Support

Deliverable D03 clarified a tailor-made regulation for operational support of the electricity system is lacking in Vanuatu. Consequently, a customized set of laws is required to support the reliable and efficient operation of the electricity system. The Marshall Islands have provided some guidelines for establishing a bespoke O&M framework.⁴⁹ These guidelines encompass conducting a thorough examination of the factors that contribute to the failure of adequate O&M, devising a plan to address these issues and establishing an institutional setup for rural electrification tailored to each specific installation. It is also important to implement training programs in local languages and use local traditional structures, in order to enhance credibility. Moreover, installation standards for off-grid installations should be developed and enforced. This approach would ensure that local community members gain the necessary knowledge and skills to independently perform basic O&M tasks over the long-run.⁵⁰ It is also suggested that the College of the Marshall Islands and/or University of the South Pacific support such an attempt and provide specialized courses in installation and O&M for standard modular mini-grids.

Following the example of the Marshall Islands, Vanuatu could also establish a regulatory regime governing the O&M of renewable energy projects beyond a project-basis. Overall, this set of laws should reinforce the stability and effectiveness of

the electricity grid and provide targeted support and incentives to renewable energy projects aiming to overcome the particularities and operational needs of Vanuatu.

3.4. Investor Income Guarantees

A primary cost-based challenge that may impede and prevent private investors from investing in renewable energy sources is the lack of an enabling environment for their participation in the electricity sector. More specifically, as it has already been stressed, in Vanuatu there is no bespoke legislation dedicated to economic support for RES installations. According to the Solomon Islands' policies, a conducive environment for investors includes providing duty concessions, investment allowances, tax exemption, tax-free regions and low corporate tax rate.⁵¹ In other terms, such policies offering a package of investment incentives for renewable energy may create a more attractive environment for local, regional or international investors to fund new RES installations.

Fiji also prioritized establishing favorable conditions for private sector investments.⁵² This entails eliminating any regulatory uncertainties that potential investors may encounter. Therefore, setting a support scheme such as net-metering or feed-in-tariff in order to incentivize investments in renewables and enabling small companies and households to feed excess electricity from renewables to the grid and benefit from a reasonable price.⁵³ In addition, it is considered important to create a clear procedure for the procurement of new large-scale capacity from IPPs, ensuring that pricing and other principles are uniformly applied in all future PPAs and grid connection requirements.⁵⁴ A similar approach has been adopted in Samoa, where it is recognized that in order to promote investments in the energy sector, it is essential to establish transparency for contractual obligations and to try to minimize the risks by incorporating terms and conditions in PPAs for IPPs.

4. Conclusion

To sum up, this Deliverable builds upon the Onshore Renewable Energy Potential Introductory Brief (D01), the Legal and Regulatory Brief (D02) and the Regulatory Challenges Brief (D03), with the aim to identify good policies and practices for the integration of renewable energy sources in Vanuatu. Similar problems and barriers are faced

in most Pacific Islands and their policy documents and laws, where present, provide some useful insights into possible recommendations aimed at overcoming regulatory barriers which constrain the uptake of renewable energy sources. A comprehensive review of such policies and laws leads to the conclusion that there is a host of potential measures of interest to Vanuatu. These include reinforcing the role and powers of its regulatory authority, reshaping the legislation for a coherent RES regime with streamlined procedures and interconnected institutions, increasing incentives for private investments and energy market competition, and ensuring the adequate training of local workers for the RES sector. Yet,

any such reform must be carefully considered in order not to undermine Vanuatu's biodiversity and local communities. Indeed, decarbonization of the energy system cannot be met at the expense of nature and local populations.

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