



# Combined Project Information Documents / Integrated Safeguards Datasheet (PID/ISDS)

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Appraisal Stage | Date Prepared/Updated: 30-Jan-2017 | Report No: PIDISDSA19649



**BASIC INFORMATION**

**A. Basic Project Data**

|                                                    |                                                            |                                                                                              |                                              |
|----------------------------------------------------|------------------------------------------------------------|----------------------------------------------------------------------------------------------|----------------------------------------------|
| Country<br>Vanuatu                                 | Project ID<br>P160658                                      | Project Name<br>Rural Electrification Project Stage II                                       | Parent Project ID (if any)                   |
| Region<br>EAST ASIA AND PACIFIC                    | Estimated Appraisal Date<br>06-Feb-2017                    | Estimated Board Date<br>27-Apr-2017                                                          | Practice Area (Lead)<br>Energy & Extractives |
| Lending Instrument<br>Investment Project Financing | Borrower(s)<br>Ministry of Finance and Economic Management | Implementing Agency<br>Department of Energy, Ministry of Climate Change and Natural Disaster |                                              |

**Financing (in USD Million)**

| Financing Source                                    | Amount       |
|-----------------------------------------------------|--------------|
| Strategic Climate Fund Grant                        | 6.77         |
| International Development Association (IDA)         | 2.00         |
| IDA Grant                                           | 2.00         |
| Pacific Regional Infrastructure Facility Trust Fund | 3.40         |
| <b>Total Project Cost</b>                           | <b>14.17</b> |

Environmental Assessment Category

B - Partial Assessment

Decision

The review did authorize the preparation to continue

Other Decision (as needed)

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**B. Introduction and Context**

Country Context

1. The Republic of Vanuatu is an archipelago of 83 volcanic islands (65 of them inhabited) covering a total area of about 12,200 square kilometers, of which approximately a third is land. The country has been a democratic republic since gaining independence from the United Kingdom and France in 1980. Vanuatu's population is approximately 258,000 people, almost evenly distributed among the six administrative provinces:



Malampa, Penama, Sanma, Shefa, Tafea and Torba. The national household count stands at an estimated 55,000, of which approximately 13,750 households (25 percent) are located in urban areas and the remaining 41,250 (75 percent) are dispersed in rural areas.

2. The average household monthly income in Vanuatu is VUV 83,800 (US\$791), with an average household monthly income of VUV 97,500 (US\$921) reported in urban areas, compared with VUV 79,500 (US\$750) in rural areas. In per capita terms, this equates to VUV 18,700 (US\$176) per person per month in urban areas and VUV 16,400 (US\$154) per person per month in rural areas. Generally, urban households in Vanuatu rely on wages and salaries from labour-based activities as their main source of income. However, because of the intermittent and costly access to transport services connecting the rural communities to urban centers, rural households rely mainly on home consumption (subsistence) and household enterprises based around the sale of agricultural products, handicrafts, and other goods produced in the home.

3. For female headed households the average monthly income across Vanuatu is VUV 59,300 (US\$560) – VUV 85,200 (US\$804) in urban areas and VUV 51,200 (US\$483) in rural areas. In per capita terms, for female headed households VUV 18,300 (US\$172) per person per month in urban areas and VUV 13,700 (US\$129) per person per month in rural areas.

4. Vanuatu has become one of the fastest growing economies of the Pacific region. The economy has experienced strong and sustained growth mainly driven by tourism, construction, and aid inflows. The per capita Gross Domestic Product (GDP) is estimated at US\$3,100, yet the cost of basic infrastructure services is high and affects the business environment in the country. For instance, Vanuatu ranks 83<sup>rd</sup> in the “ease of doing business” indicator reported by the World Bank Group, which analyzes a total of 189 economies, and 81<sup>st</sup> in “getting electricity” indicator, down from 75<sup>th</sup> in 2015, mainly due to the high cost associated with obtaining a new connection to the electricity grids.

#### Sectoral and Institutional Context

5. **Institutional Context:** Electricity services in Vanuatu are delivered through three types of models. These models include: (a) independent “main grid systems” in the main urban centers (Port Vila and Luganville); (b) isolated “mini grids” in lesser population concentrations but where a grid supply system is still a technically and economically competitive option (e.g., parts of Tanna and Malekula); and (c) decentralized energy service systems. Grid electricity in Vanuatu is supplied by two concessionaires, Union Electrique de Vanuatu Ltd (UNELCO) in three provinces (Shefa, Malampa and Tafea) and Vanuatu Utilities and Infrastructure (VUI) in Sanma province.

6. The private sector is responsible for generating and supplying electricity under concession agreements with the Government of Vanuatu. There are currently four concession areas in Vanuatu operated by UNELCO and VUI. UNELCO has been operating in Vanuatu since 1939 and supplies the Efate (Shefa province), Malekula (Malampa province) and Tanna (Tafea province) concession areas. In Efate, the concession is in force until the year 2031 and provides UNELCO exclusive rights to generate and supply electricity. The concessions in Tanna and Malekula are in force until the year 2020. VUI, a subsidiary of Pernix Group, has supplied the Luganville concession area since January 1, 2011, after signing an Operations and Maintenance agreement with the



Government of Vanuatu for the Luganville concession (Sanma province). The Government of Vanuatu is re-tendering the Luganville concession area.

7. The installed generation capacity and supply to the grid network in Port Vila, Luganville and parts of Tanna and Malekula islands is insufficient to meet national demands for electricity. The total installed capacity in these grids is 31.6 Megawatts (MW). Of this capacity 26.5 MW is in Port Vila (peak demand 11.3 MW), 4.1 MW in Luganville (peak demand 1.50 MW), 0.5 MW in Malekula (peak demand 0.12 MW) and 0.5 MW in Tanna (peak demand 0.12 MW). Around 29 percent of electricity is produced using renewable energy and the remaining 71 percent of electricity is generated from diesel powered plants using imported fuel.<sup>1</sup> In some other areas, such as provincial centres in Torba, Penama and Malampa provinces, electricity is provided through the provincial government and there are some community operated electricity generators such as Port Olry, but operation of this grid was recently taken over by VUI due to the inability of the community to continue to operate and maintain the grid.

8. The Department of Energy (DoE), within the Ministry of Climate Change Adaptation, Meteorology, Geohazards, Energy, Environment and Disaster Management, on behalf of the Government of Vanuatu, has recently completed a number of biofuel mini grids through a construction contract with UNELCO. The DoE is negotiating an interim management contract with one of the incumbent utilities for the operation of these mini grids. For the longer term, the Government's intention is for the mini grids to be "rolled into" the adjacent concessions when the concessions are renewed. The Government will also make provisions in the concession agreements for the incorporation of mini grids into the concessions in the future, starting with the Luganville concession agreement which is being tendered. Until such time as the mini grids are incorporated into the concessions, the Government intends to negotiate management contracts with the appropriate concession holders.

9. The Utilities Regulatory Authority (URA) regulates electricity tariffs in the concession areas. The electricity tariffs fluctuate with fuel, labor, and material prices in country. Prices for electricity supply outside the concession areas are not regulated. Outside the concession areas, the DoE is responsible for electrification projects (rural electrification). The DoE is responsible for central coordination of the development of the energy sector in Vanuatu, and plays a central role in coordinating energy sector development and policy. Other Government Ministries involved in the electricity sector include the Ministry of Infrastructure and Public Utilities, which is responsible for all the public infrastructure of the government, and the Ministries of Education and Health, which have in the past been beneficiaries of solar energy packages for social institutions through various donors.

10. **Sectoral Context:** An estimated 30 percent of the Vanuatu population has access to electricity. On the four islands with electricity grids (Efate, Espiritu Santo, Tanna and Malekula), the share of those without access to electricity remains high: Efate (24 percent), Santo (65 percent), Tanna (86 percent), and Malekula (84 percent).<sup>2</sup> Even within the concession areas, about one in five households remain without access to electricity, primarily because of the up-front costs of connection to the grid and the grid network does not yet extend to all communities within the concession boundaries.

11. Access to electricity rates drop off considerably in rural areas; the population without access in rural areas ranges from 83 - 85 percent in Tafea and Shefa provinces, 89 percent in Sanma province, 92 percent in

<sup>1</sup> Vanuatu Utilities Regulatory Authority

<sup>2</sup> Vanuatu: National Energy Road Map (NERM), 2013



Malampa province and 97 percent in Torba province.<sup>3</sup> Overall, it is estimated that only 20 percent of the rural population has access to electricity, usually through the use of diesel generators or solar systems. The lower population density in rural areas, remoteness and large distances between customers, lower electricity loads, and lower incomes (lower economies of scale and scope) have meant that the extension or building of new electricity grids for supply to peri-urban and rural consumers are generally not affordable or financially attractive. Further, there is absence of technical expertise and readily available supply chain in the remote areas and the implementation capacity in the Government is low. Government/supply driven approaches and community ownership and operations of facilities have generally not worked mainly due to the inability of government departments to fund the supply and maintenance in a sustainable manner and the communities' lack of technical and financial expertise. Alternative methods of services, such as private sector delivery, have been much more effective.

12. The most recent Household and Income Expenditure Survey (HIES) reported over half of the households in Vanuatu do not usually use electricity as the main means of lighting their homes. This number increased to approximately 70 percent in rural areas and decreased to 20 percent in urban areas. The HIES found that 42 percent of rural households use kerosene lamps as the main means of lighting, and approximately one-third of all Vanuatu households use such means for lighting, while other sources of lighting include candles (3 percent); wood/coconut shells (2.4 percent); Coleman lamp (1 percent); gas (0.4 percent), and of the total rural households, 20 percent of households reported 'other' sources of lighting.<sup>4</sup> The Vanuatu socio-economic Atlas found only 6.3 percent of households have a solar system or solar lamp as the main source of lighting. The use of a solar system or solar lamp as the main source of lighting varies across the provinces: 7.5 percent in Torba, 7.2 percent in Sanma, 3.5 percent in Penama, 9.9 percent in Malampa, 7 percent in Shefa, 13.1 percent in Tafea.<sup>5</sup> Of those households using electricity, 91 percent were supplied through UNELCO and VUI compared with only 3 percent using household generators and 2 percent receiving their electricity through the provincial government.

13. There is consumer demand for higher capacity and semi-permanent solar systems (Solar Home Systems (SHS) and micro grids) that go beyond lighting and provides services for mobile phone charging, radios, laptops, water pumps, small fridges, etc. However, affordability is the biggest barrier for consumers to move up to SHS with higher power outputs and enhanced user benefits. The average total rural household income is VUV 79,500 (US\$750) per month, of which an average of VUV 69,300 (US\$630) is spent on total expenditures per household per month. On average, only 59 percent of a consumer's income is in the form of cash.<sup>6</sup> Table 1 below shows average monthly income, average monthly cash income and net cash incomes in US\$ for the various provinces in Vanuatu. Moreover, access to finance is difficult for rural households who do not have a regular income, may not own land, and cannot demonstrate a credit history. The reach of financial services in the remote areas is being promoted but is in its infancy. Further, there is anecdotal evidence that consumers in Vanuatu have a preference to save before buying equipment. This may be due to unfamiliarity with credit mechanisms or due to distrust of arrangements due to prior bad experience with borrowing.

<sup>3</sup> NERM, 2013

<sup>4</sup> Vanuatu Household Income and Expenditure Survey 2010, Vanuatu National Statistics Office, 2012.

<sup>5</sup> Vanuatu Socio-Economic Atlas, 2014

<sup>6</sup> Vanuatu Household Income and Expenditure Survey 2010, Vanuatu National Statistics Office, 2012



Table 1: Average Monthly Household Income by Province<sup>7</sup>

|                            | Torba | Sanma | Penama | Malampa | Shefa | Tafea | RURAL |
|----------------------------|-------|-------|--------|---------|-------|-------|-------|
| Average income (US\$)      | 599   | 855   | 616    | 548     | 1,199 | 486   | 841   |
| Average cash income (US\$) | 317   | 496   | 289    | 306     | 971   | 146   | 426   |

14. In addition to SHSs and micro grids, a mini grid is an alternative option for electrification in more isolated island bound communities. While not a new technology, mini grids have recently captured growing interest as renewable energy becomes increasingly cost effective and technological advances – such as demand side management, energy efficient appliances, battery storage and smart grid developments – facilitating renewable integration and reducing the cost of decentralized generation.<sup>8</sup> In addition, recent advancements in battery technologies and significant reductions in the cost to install storage systems has increased the viability for widespread adoption of storage systems in grid systems. In many remote applications, renewable energy mini grids are already the most cost-effective electrification option, and can provide a sustainable and secure energy service.

15. Throughout literature there is not a consistent definition of micro and mini grids. In Africa and Asia, mini grids are sized according to MWs, while in the Pacific a 500kW system is considered to be a grid. For the purpose of the project, and in the Pacific context, SHS/micro grids and mini grids are defined as follows:

a. **Micro grids** = Direct Current (DC) or Alternating Current (AC) grids connecting a small number of contiguous households or businesses providing mainly SE4ALL Tier 2 or 3 access to household electricity supply (e.g., a school, staff quarters, local shop or a health center, staff quarters with possibly some Tier 4 or 5 service, e.g., for refrigeration in a health center (AC with an inverter). This is essentially a large solar home system by Australian standards.

b. **Mini grids** = AC grids connecting a number of households and businesses with SE4ALL Tier 4 or 5 access to household electricity supply (or intended for Tier 4 or 5 service in the short to medium term). These mini grids will be capable of receiving generation such as from mini hydros, biomass, etc. and may be later interconnected into island grids.

16. The lack of access to modern energy services that are affordable, safe and clean forces the low-income population to accept using higher priced inferior alternatives. Left unchecked, such a situation of “energy poverty” entrenches the income poverty trap, exacerbated by the inferior quality of health care, education and other local services needed, while also limiting income generation opportunities. Well-orchestrated and targeted actions and investments for scaling up modern energy access to all can make a significant difference in improving the lives of otherwise excluded rural and low-income population segments. In particular, well designed and targeted policies and investment plans for the sector aimed at bridging the “affordability gap”,

<sup>7</sup> Vanuatu Household Income and Expenditure Survey 2010. Vanuatu National Statistics Office, Government of Vanuatu. December 2012.

<sup>8</sup> ITP, Development of Off-Grid Electricity Supply in Vanuatu – Pre-feasibility studies for Hybrid Mini grids



especially for the low-income segments of the population, are crucial for ensuring broad-based and sustainable benefits.

17. Access to modern energy is a fundamental enabler and catalyst for economic development, and enhancing livelihoods and well-being of the population. The relationship between the use of modern energy and economic growth and development is fairly well established and documented. Energy fundamentally influences most aspects of people's daily lives and well-being. Directly and otherwise, modern energy is central to achieving progress on almost all dimensions of human welfare and development, including education, health care, access to water, essential communications and information, as well as simple financial transactional services, income generation, and environmental sustainability. It is widely accepted from worldwide experience that electricity use and GDP per capita are highly correlated. Energy and development are mutually reinforcing factors in that energy not only returns from but also actively contributes to economic growth and development in national aggregated average terms.

18. The Government of Vanuatu has made the development of the electricity sector a top priority. The Government has recognized that access to electricity is a key driver for social and economic development. The Vanuatu National Energy Roadmap (NERM) 2013 - 2020, which was developed with support from the World Bank, lays the foundation for future energy sector policy and investment in Vanuatu. It seeks to address key constraints that have prevented the energy sector from delivering affordable modern energy access in an efficient and sustainable manner to the vast majority of the population of Vanuatu.

19. The NERM identifies five priority areas and targets for Vanuatu's energy sector, including: (a) *Access* – Access to secure, reliable and affordable electricity for all citizens (100 percent) by 2030; (b) *Petroleum Supply* – reliable, secure and affordable petroleum supply throughout Vanuatu; (c) *Affordability* – lower cost energy services in Vanuatu; (d) *Energy Security* – an energy secure Vanuatu at all times; and (e) *Climate Change* – mitigating climate change through renewable energy and energy efficiency.

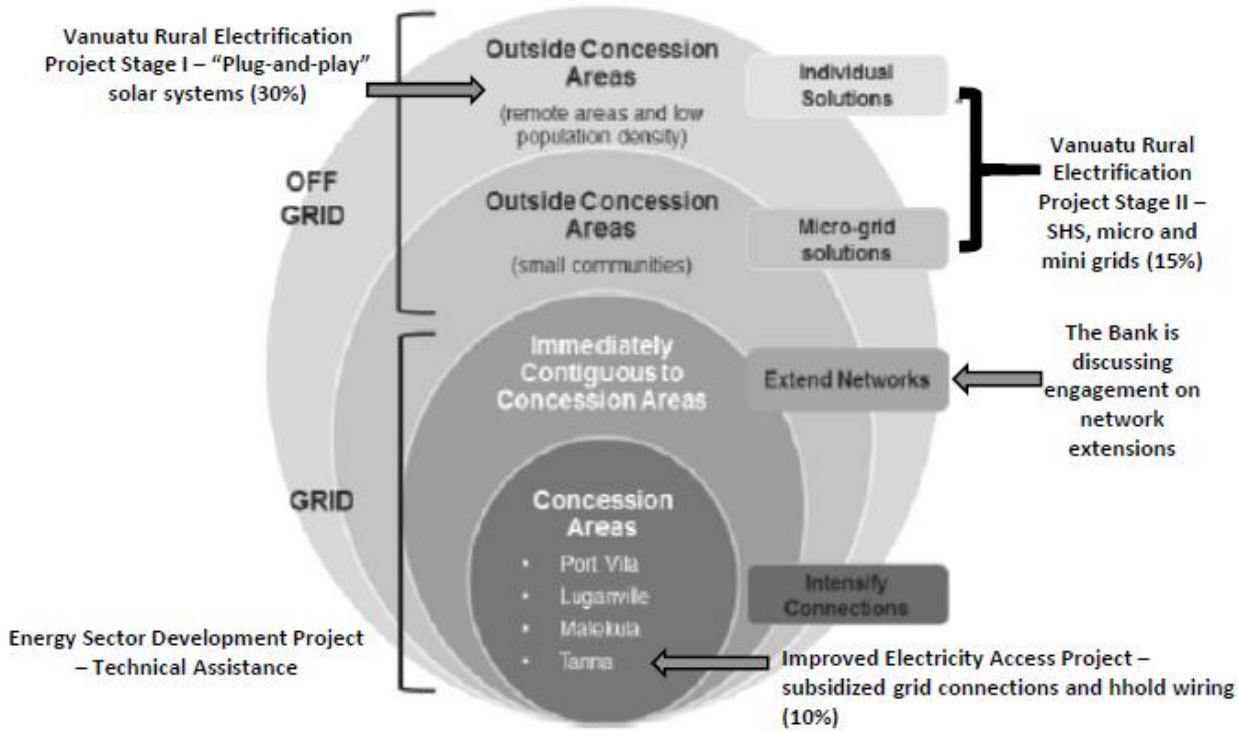
20. To address the climate change imperatives and meet its Intended Nationally Determined Contributions (INDCs) the Government of Vanuatu has set NERM targets to achieve 65 percent electricity generation from renewable energy by 2020 and 100 percent by 2030. Further, it proposes to achieve the access targets in a sustainable manner with solutions (on the Sustainable Energy for all (SE4ALL) spectrum) that take into account: (i) economic and financial viability, and least cost approaches; (ii) countries' resources, technical expertise and implementation capacity; (iii) geographic spread – economies (or lack of) scale, and supply chain; (iv) affordability considerations; and (v) sustainability – built around creating sustainable private sector industry both for grid and off grid supply.

21. Figure 1 illustrates how the World Bank is supporting the Government of Vanuatu to achieve access and renewable energy targets of the NERM for Vanuatu through a comprehensive investment program targeted at different segments of the energy sector.<sup>9</sup> Together the World Bank supported energy projects will increase access to electricity from the current 30 percent to over 80 percent over the medium term.

**Figure 1: Strategic Framework for Scaling up Electricity Access Nationwide by 2030**

<sup>9</sup> NERM, 2013





**C. Proposed Development Objective(s)**

Development Objective(s) (From PAD)

The Project Development Objective is to support increased penetration of renewable energy and increased access to electricity services in the dispersed off-grid areas of Vanuatu.

Key Results

- 22. Progress will be measured against the following results indicators:
  - a. Generation capacity of energy constructed or rehabilitated (MW) – The indicator measures in MW the generation capacity of renewable energy facilities constructed through operations supported by this project.
  - b. Annual electricity output from renewable energy as a result of renewable energy constructed under the project (GWh)
  - c. People provided with new or improved electricity service (number) – This indicator measures the number of people that have received new electricity services through operations supported by this project.

**D. Project Description**

23. The project will strengthen the capacity of the Government of Vanuatu and the DoE to implement key energy sector projects and build technical and fiduciary skills within the Department to support rural electrification. This project will support the implementation of the SREP Renewable Energy Investment Plan for





Vanuatu. The project under the Investment Plan comprises two projects: Vanuatu Rural Electrification Project Stage I (VREP I) and Vanuatu Rural Electrification Project Stage II (VREP II).

24. VREP I was prepared and approved in parallel to the preparation and endorsement of the Vanuatu SREP Investment Plan. The objective of VREP I is to scale up access to electricity services through plug-and-play solar systems for rural households, aid posts and community halls located in dispersed off grid areas. The total project cost is US\$7.8 million comprising a Pacific Region Infrastructure Facility (PRIF) grant totaling US\$4.7 million and US\$3.1 million in the form of customer contributions toward the retail cost of the systems. VREP I consists of two components: Electrification of 17,500 off-grid households, 230 aid posts and 2,000 community halls (US\$6.2 million) and technical assistance and project management (US\$1.6 million). The project subsidizes the retail cost of the approved solar systems by 50 percent initially. The level of subsidy will be scaled back as the market becomes self-sustaining. The initial level of subsidy was determined through an assessment of Willingness to Pay, average cash income levels for rural households and the expected retail costs of systems.

25. Under VREP I, Vendors (retailers registered and approved by the DoE) supply approved products that are included in a Product Catalogue (products must be registered under the Lighting Global program) to qualify for subsidies. Using Lighting Global certified products ensures high energy system performance, such as lighting output and run time as well as high quality and durability, such as protection from physical ingress and water and battery protection. The size of “plug-and-play” systems was initially limited to between 5 Wp and 30 Wp to target the very remote communities. The size of products will be increased over time with the condition being that the products be suitable for installation and maintenance by users due to the remoteness of the target beneficiaries and lack of technical expertise in those areas.

26. The roll out of “plug-and-play” systems commenced in February 2016. Since February, over 650 approved systems have been sold in more than 20 islands achieving national coverage. Overall sales have been increasing as the vendors gain confidence with the demand for the products and increase the size of their orders, strengthen and expand their supply chain, and work towards innovative ways of supporting householders in remote areas of Vanuatu to access the products and to finance their contribution.

27. Building on VREP I, VREP II will support SHS, micro and mini grids in rural areas, strengthen institutions, and increase business opportunities for the private sector for the supply decentralized electricity services. VREP II will transition from “plug and play” systems to more advanced SHS that require technical support, micro grids and mini grids where the latter can be supported on economic or piloting benefits. The project includes three components:



28. **Component One: Provision of Solar Home Systems and micro grids in rural areas of Vanuatu (US\$5.37 million).** This component will support expansion of access to reliable electricity service in rural Vanuatu through SHS and micro grid configurations where mini grid configurations are unlikely to be economically viable and which are not earmarked for mini grids under this or other donor or government projects or are the least cost solution. SHS and micro grids will be available to rural households and public institutions.<sup>10</sup> This component will target approximately 37 public institutions and 8,400 rural households, which equates to approximately 42,000 people.<sup>11</sup>

29. SHS and micro grids may include systems for household use (of varying capabilities and costs as per demand) and will be available for purchase to all rural consumers, a community application, for example, for a church, electrification of a health center based on its needs, and may include solar water pumps or other similar applications. To ensure the project is reaching the targeted beneficiaries, data on household income will be collected during either the application or verification process. The project will partly subsidize the retail cost of SHS and micro grids. An amount will be established (initially 33 percent of retail cost) and then may be varied over time depending on the take up rate and the size of the system. The consumer will arrange his/her portion of the funds for the purchase (initially 67 percent of the retail cost), either by means of cash or microfinance credit (either via a microfinance provider or through the vendor).

30. Under this market-based mechanism, consumers will purchase systems from competing vendors at subsidized prices. Information on products will be disseminated through vendors and communities via a Product Catalogue, which will list all products the vendors are selling and that are eligible for a subsidy under the project. The technical standards (international standards) and the type of products available under this component will be set out in the catalogue which will be reviewed from time to time, or in the case of micro grids it may be sourced through tender which will set out the specifications, standards and operations and maintenance arrangements. Vendors may also undertake direct marketing and road shows such as those done for VREP I and drawing on the experience from the Sustainable Energy Financing Project in Fiji. The consumer will inform the vendor of his/her intended purchase, either by visiting the shop or through post/phone/email communication, and arrange payment.

31. **Component Two: Construction of mini grids in rural areas of Vanuatu (US\$6.8 million).** This component will support the expansion of access to reliable electricity services for rural communities through support for the design, supply, installation and commissioning of mini grid systems. The project will finance the construction of 5 mini grids, based on initial cost estimates. The criteria for selection of sites with potential to support a mini grid is: (i) community household numbers greater than 75 households; and (ii) business and public institutions load greater than 50 percent of the total load. This component will support electricity service provision to approximately 550 rural households, which equates to around 2,750 people, and public institutions and businesses.

32. **Component Three: Technical Assistance and Project management (US\$2.0 million).** This component addresses three key areas of the project, the first focusing on the vendor registration model for Component one, the second focusing on Owners' Engineer for Component two and the third focusing on project management. In addition, there is an allowance for Government contribution (US\$1.5 million "in kind") that will cover the

<sup>10</sup> Public institutions under this component may include community facilities such as community halls and churches.

<sup>11</sup> On average 4.9 (or five) people usually live together in one household...Urban households were on average slightly larger than rural ones with an average of 5.2 people. Vanuatu Household Income and Expenditure Survey 2010, 15, Vanuatu National Statistics Office, 2012



Government of Vanuatu’s direct project related costs, such as arrangements for voluntary land donation and other inter-departmental support. The main areas and key activities funded under the project are set out below:

a. Vendor and product registration arrangements, communications and implementation arrangements. Building on the established implementation arrangements under VREP I, the following activities will be financed to support the implementation of the investment activities under Component 1: (a) hire a technical consultant to prepare technical standards; (b) amendment of the vendor registration arrangements to incorporate SHS and micro grids; (c) amendment of product registration arrangements (for a product catalogue) to incorporate SHS and micro grids; (d) development of program and product awareness, safety and product care training material for communities, and end users; (e) establishment of a grievance mechanism for end-user and communities; (f) explore opportunities for the development of a microfinance product to encourage lending in rural areas; and (g) support for adoption of legislation, regulations and/or further refinement of the VREP I Environmental Code of Practice (ECOP) for disposal of batteries and solid wastes for products under the project.

b. Owners’ Engineer. The following activities will be financed to support the preparation and implementation of the investment activities under Component 2: (i) site selection; (ii) technical design of each micro and mini grid; (iii) prepare the environmental and social impact assessment and management plans; (iv) preparation of bid documents and contracts for the construction of the micro and mini grids and assist with the bidding and award process; (v) supervision of the construction and commissioning works; and (vi) compliance and reporting on the implementation of the environmental and social impact assessments and management plans.

c. Project management and support. The following activities will be financed for effective implementation, monitoring and reporting under the project: (i) execution of awareness programs to rural communities and consumers in Vanuatu, in particular consultation with communities on the long list to request their expression of interest to receive a micro or mini grid; (ii) verification agent to certify the retails sales of SHS and micro grids under Component 1; (iii) capacity building and implementation support to the DoE through the Owners’ Engineer; (iv) monitoring, evaluation and annual reviews of the project; and (v) operating costs associated with this project as provided for in the legal agreement.

Component Name:  
Solar Home Systems and construction of micro grids in rural areas of Vanuatu

Comments (optional)

Component Name:  
Construction of mini grids in rural areas of Vanuatu

Comments (optional)

Component Name:  
Technical Assistance and Project Management



Comments (optional)

**E. Project location and Salient physical characteristics relevant to the safeguard analysis (if known)**

The investments will be made in rural areas in Vanuatu. The GoV will identify potential locations for micro and mini grids (long list) taking into account population density (number households), public facilities such as hospitals and schools, ‘anchor’ loads such as tourism facilities, food processing or other commercial operations, and potential sources of renewable energy sources for feeding into the mini-grids in future. The potential for clustering of mini grids to achieve scale during construction and operations will also be taken into account. Although there are a range of potential micro and mini-grid solutions, the initial design will be based on solar photovoltaics (PV) with or without storage with diesel (biofuel capable). The installations will be modular, scalable with demand growth and will allow for other generation sources, such as micro/mini/small hydro, to be connected in future. Communities in the long listed sites will be invited by the GoV to elect to receive a micro or mini-grid under the project. This is a demand driven initiative where communities elect to benefit from project outcomes and will be delivered in partnership with the communities. Accordingly, communities electing to receive micro or mini grids will provide access to community land (land donation) for the siting of the generation installations and siting of the distribution network and the Bank’s consultation and documentation requirements for land donations will need to be satisfied to ensure all parties are actively involved and that no particular individuals experience an unequal burden on behalf of the community etc.

**F. Environmental and Social Safeguards Specialists on the Team**

Penelope Ruth Ferguson, Ross James Butler

**IMPLEMENTATION**

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**SAFEGUARD POLICIES THAT MIGHT APPLY**

| Safeguard Policies                  | Triggered? | Explanation (Optional)              |
|-------------------------------------|------------|-------------------------------------|
| Environmental Assessment OP/BP 4.01 | Yes        | This safeguard policy is triggered. |



The project will involve siting of modular solar/battery/diesel hybrid systems, installation of solar panels, and construction of distribution lines . The installations will be carried out in remote communities. Solar panels will be installed either on roof tops of existing or new buildings or as ground mounted structures. There will be relatively minor local environmental impacts during construction and the project will need to include considerations on fuel management and the future disposal of batteries where used.

Vanuatu is already implementing the Vanuatu Rural Electrification Project Stage I that is supported by an Environmental Code of Practice (ECOP) for battery disposal. Further, recently with the support of a World Bank Technical Assistance Project, the GoV has developed draft legislation for disposal of solid wastes, including batteries that is being considered by the State Law Office.

To ensure compliance with both World Bank Safeguard policies and the environmental legislation of the Vanuatu, an Environmental and Social Safeguards Management Framework (ESMF) has been prepared to guide the provides screening of guidance for candidate projects, inform any and provides a process for environmental impact assessments and the development of environmental management plans and includes reference to the ECOP for disposal of batteries.

|                                        |    |                                                                                                                                                                                                                                                                                                      |
|----------------------------------------|----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Natural Habitats OP/BP 4.04            | No | As the project sites will be implemented in already developed rural areas, including streets, roads and local communities, the Project would not cause any impacts on any critical natural habitats.                                                                                                 |
| Forests OP/BP 4.36                     | No | The project activities are not expected to create or induce deforestation and their environmental impact is not expected to compromise the integrity and health of forested areas. Some minor clearings of trees, shrubs and undergrowth within urban areas may be necessary install infrastructure. |
| Pest Management OP 4.09                | No | The Project will not involve use of pesticides or herbicides.                                                                                                                                                                                                                                        |
| Physical Cultural Resources OP/BP 4.11 | No | Physical cultural resources are not envisaged in the project area because the project locations will be                                                                                                                                                                                              |



|                                                |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|------------------------------------------------|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                |     | selected by host communities/beneficiaries. Because the project involves some earthworks a chance to find procedure will be required for each ESMP.                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Indigenous Peoples OP/BP 4.10                  | No  | Based on an assessment carried out in 2013 by OPCS, OP 4.10 indicates that all four defining characteristics should be present to trigger the Indigenous Peoples policy and these characteristics are not present in Vanuatu. Accordingly, the policy would not be triggered for the project. Given the strong community driven nature of the works in the electricity sector, extensive consultation and citizen engagement will be required to allow effective implementation. This would include engagement with all components of the communities.                                  |
| Involuntary Resettlement OP/BP 4.12            | Yes | This policy is triggered. Since the Project will rely on site selection by the communities, it is anticipated that any impacts on land will be minimal. Government land will be prioritized. All land acquisition will be via a negotiated arrangement (lease or voluntary land donation etc.). There may however be a need to remove trees and other income producing vegetation/installation for technical reasons, which will be avoided to the maximum extent possible. AResettlement Policy Framework has been developed in accordance with the World Bank safeguard requirements. |
| Safety of Dams OP/BP 4.37                      | No  | No dam will be affected by the project. No dam will be built by the project.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Projects on International Waterways OP/BP 7.50 | No  | No project activities will take place on international waterways.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Projects in Disputed Areas OP/BP 7.60          | No  | There are no known disputed areas in the project areas of influence.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

**KEY SAFEGUARD POLICY ISSUES AND THEIR MANAGEMENT**

**A. Summary of Key Safeguard Issues**

1. Describe any safeguard issues and impacts associated with the proposed project. Identify and describe any potential large scale, significant and/or irreversible impacts:



SHS and mini grids with reliable power supply are expected to yield economic, environmental and social benefits – better health, education, productivity, and overall improvement of the human development indicators in rural and peri-urban areas. There are no potential large scale, significant or irreversible impacts. The most notable potential environment and social impacts are based around the operational management of fuel, and the end-of-life disposal of solar panels. The ESMF identifies Environmental Codes of Practice for mitigation and management of impacts, and the requirement for site specific screening and environmental assessment (ESIA and / or ESMP).

2. Describe any potential indirect and/or long term impacts due to anticipated future activities in the project area:

Long term benefits include development opportunities from electrification and a more sustainable market for SHS, micro and mini grid goods and services. Future potential issues with the disposal of solar panels will be managed under the ECOP as discussed above.

3. Describe any project alternatives (if relevant) considered to help avoid or minimize adverse impacts.

No relevant project alternatives were considered.

4. Describe measures taken by the borrower to address safeguard policy issues. Provide an assessment of borrower capacity to plan and implement the measures described.

An ESMF and RPF have been prepared by the borrower. The capacity of the DoE is low and will be supplemented during the project with a part time safeguards advisor who will oversee the implementation of the ESMF and RPF. The Owners Engineer will have the additional responsibility of preparing ESIA and ESMP for Vanuatu regulatory processes and for World Bank clearance. They will also provide construction ESMP supervision.

5. Identify the key stakeholders and describe the mechanisms for consultation and disclosure on safeguard policies, with an emphasis on potentially affected people.

Key governmental and non-governmental organisations are Department of Lands, Department of Environmental Protection and Conservation, Provincial Governments, Council of Churches, Energy Utility Companies (UNELCO and VUI). These groups attended a project workshop where the project concept and draft ESMF and RPF were presented for comment. Final ESMF and RPF were disclosed on the DOE website in December 2016. All future safeguards instruments will be disclosed locally in hard copy and on the DoE website.

Village level consultation will occur during project implementation. DoE will invites villages on the long list to elect to receive electricity and inform them of the objectives and structure of the project. The community engagement will consist of public meetings and face-to-face discussions with communities to discuss energy needs and issues in the community, enable the Department to illustrate the technology, discuss the technology benefits and the implications of the community becoming customers, and to discuss and identify suitable land to house the necessary infrastructure. The objectives of the engagement process are: (i) to understand the energy issues and needs of the community; (ii) inform communities they are eligible to receive a mini grid, and (iii) to ensure that all communities who decide to receive a mini grid are advised of the benefits, costs, safeguards implications, and financial requirements of participating. Emphasis will be placed on ensuring that women are engaged, and that all community members are informed and have a chance to participate.

## **B. Disclosure Requirements (N.B. The sections below appear only if corresponding safeguard policy is triggered)**

### **Environmental Assessment/Audit/Management Plan/Other**





|                             |                                |                                                                                                          |
|-----------------------------|--------------------------------|----------------------------------------------------------------------------------------------------------|
| Date of receipt by the Bank | Date of submission to InfoShop | For category A projects, date of distributing the Executive Summary of the EA to the Executive Directors |
| 15-Dec-2016                 | 10-Jan-2017                    |                                                                                                          |

**"In country" Disclosure**

Vanuatu  
15-Dec-2016

Comments

The ESMF was disclosed on the DoE website. Consultations on the ESMF were undertaken and all relevant stakeholders are fluent in English, so the ESMF was not translated. When the ESMP/ESIA are prepared for each mini grid site, summaries of the documents will be translated into the relevant languages and made accessible to the affected communities.

**Resettlement Action Plan/Framework/Policy Process**

|                             |                                |
|-----------------------------|--------------------------------|
| Date of receipt by the Bank | Date of submission to InfoShop |
| 04-Jan-2017                 | 10-Jan-2017                    |

**"In country" Disclosure**

Vanuatu  
30-Dec-2016

Comments

The RPF was disclosed on the DoE website. Consultations on the RPF were undertaken and all relevant stakeholders are fluent in English, so the RPF was not translated. If there is a need to prepare a Resettlement Action Plan for a mini grid site, summaries of the documents will be translated into the relevant languages and made accessible to the affected communities.

**C. Compliance Monitoring Indicators at the Corporate Level (to be filled in when the ISDS is finalized by the project decision meeting) (N.B. The sections below appear only if corresponding safeguard policy is triggered)**

**OP/BP/GP 4.01 - Environment Assessment**

Does the project require a stand-alone EA (including EMP) report?

No

**OP/BP 4.12 - Involuntary Resettlement**

Has a resettlement plan/abbreviated plan/policy framework/process framework (as appropriate) been prepared?

Yes



If yes, then did the Regional unit responsible for safeguards or Practice Manager review the plan?

Yes

### **The World Bank Policy on Disclosure of Information**

Have relevant safeguard policies documents been sent to the World Bank's Infoshop?

Yes

Have relevant documents been disclosed in-country in a public place in a form and language that are understandable and accessible to project-affected groups and local NGOs?

Yes

### **All Safeguard Policies**

Have satisfactory calendar, budget and clear institutional responsibilities been prepared for the implementation of measures related to safeguard policies?

Yes

Have costs related to safeguard policy measures been included in the project cost?

Yes

Does the Monitoring and Evaluation system of the project include the monitoring of safeguard impacts and measures related to safeguard policies?

Yes

Have satisfactory implementation arrangements been agreed with the borrower and the same been adequately reflected in the project legal documents?

Yes

## **CONTACT POINT**

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**APPROVAL**

|                      |                            |
|----------------------|----------------------------|
| Task Team Leader(s): | Kamleshwar Prasad Khelawan |
|----------------------|----------------------------|

**Approved By**

|                           |          |             |
|---------------------------|----------|-------------|
| Safeguards Advisor:       |          |             |
| Practice Manager/Manager: | Jie Tang | 31-Jan-2017 |
| Country Director:         | Mona Sur | 02-Feb-2017 |