

**ENVIRONMENTAL AND SOCIAL MANAGEMENT  
FRAMEWORK**

**FOR THE**

**VANUATU RURAL ELECTRIFICATION PROJECT  
STAGE II (VREP II)**

**Prepared for Vanuatu Department of Energy**

December 2016

# TABLE OF CONTENTS

TABLE OF ACRONYMS .....	4
A. INTRODUCTION .....	5
B. PURPOSE AND SCOPE OF THE ESMF.....	7
C. PROJECT OBJECTIVE and DESCRIPTION .....	8
C.1 Component 1: Provision of Solar Home Systems and Micro-grids.....	9
C.2 Component 2: Construction of Mini-grids .....	9
C.3 Component 3: Project Management .....	10
C.4 Subproject Typologies.....	11
D. POTENTIAL ENVIRONMENTAL AND SOCIAL IMPACTS .....	13
D.1 Potential Environmental Impacts .....	14
1. Construction Phase Impacts.....	14
2. Operation Phase Impacts.....	14
D.2 Potential Social Impacts .....	16
E. LEGAL, POLICY FRAMEWORK AND REGULATORY REQUIREMENTS.....	18
E.1 COUNTRY LEGISLATION AND GUIDELINES .....	18
1. Environmental Legislation and Guidelines.....	18
2. Land Legislation and Guidelines .....	20
3. Energy Policy .....	20
4. Other Legislation .....	21
E.2 WORLD BANK POLICIES AND GUIDELINES .....	21
1. OP 4.01 Environmental Assessment .....	21
2. OP 4.12 Involuntary Resettlement.....	22
3. Environmental Health and Safety Guidelines .....	23
E.3 GAP ANALYSIS .....	23
F. PROCEDURES TO ADDRESS ENVIRONMENTAL AND SOCIAL ISSUES.....	24
F.1 Environmental and Social Safeguard Procedures.....	24
F.2 Environmental and Social Safeguards Instruments.....	25
F.3 Land Acquisition .....	25
G. GRIEVANCE REDRESS MECHANISM.....	26
H. PUBLIC CONSULTATION AND INFORMATION DISCLOSURE .....	27
H.1 Consultation to Date.....	27
H.2 Village Level Consultation .....	27
H.3 Information Disclosure.....	28
I. PROJECT IMPLEMENTATION ARRANGEMENTS, RESPONSIBILITIES AND CAPACITY BUILDING .....	29
I.1 Implementation Arrangements and Delivery Model.....	29

I.2 Capacity Building .....	29
I.3 Monitoring and Evaluation .....	29
REFERENCES .....	30
ANNEX 1 - ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT SCREENING CHECKLIST.....	31
ANNEX 2 – CONTENTS OF AN ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT .....	38
ANNEX 3 – CONTENTS OF AN ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN	44
ANNEX 4 - RESETTLEMENT POLICY FRAMEWORK.....	49

## TABLE OF ACRONYMS

AC	Alternating Current
CESMP	Contractor's Environmental and Social Management Plan
DC	Direct Current
DEPC	Department of Environmental Protection and Conservation
DoE	Department of Energy
ECOP	Environmental Code of Practice
EHS	Environmental, Health and Safety
EIA	Environmental Impact Assessment
EPC Act	<i>Environmental Protection and Conservation Act 2002</i>
ESIA	Environmental and Social Impact Assessment
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
GDP	Gross Domestic Product
GoV	Government of Vanuatu
GRM	Grievance Redress Mechanism
kWh	Kilowatt hours
kWp	Kilowatt peak
MIPU	Ministry of Infrastructure and Public Utilities
NERM	National Energy Road Map
OP	World Bank Operational Policy
PDO	Project Development Objective
PEA	Preliminary Environmental Assessment
PMU	Project Management Unit
PV	Photovoltaic
RPF	Resettlement Policy Framework
SHS	Solar Home System
SREP	Scaling Up Renewable Energy in Low Income Countries Program
UNELCO	Union Electrique du Vanuatu Ltd
URA	Utilities Regulatory Authority
VREP	Vanuatu Rural Electrification Project
VUI	Vanuatu Utilities and Infrastructure Ltd
vuv	Vatu

## A. INTRODUCTION

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. Vanuatu's population of approximately 258,000 people is almost evenly distributed among the six administrative provinces: Malampa, Penama, Sanma, Shefa, Tafea and Torba. Over the last decade, Vanuatu has been one of the faster growing economies of the Pacific Region, mainly driven by tourism, construction, and aid flows. The Gross Domestic Product (GDP) per capita is around United States Dollars (US\$) 3,200.

The national household count is an estimated 50,740, of which about 12,470 households (25 percent) are located in urban areas and the remaining 38,270 (75 percent) are dispersed in rural areas. The average household monthly income in Vanuatu is Vatu (vuv) 83,800, with an average household monthly income of vuv 97,500 reported in urban areas, compared with vuv 79,500 in rural areas (World Bank, 2014). Generally, 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, while urban households in Vanuatu rely on wages and salaries from labor-based activities as their main source of income.

The *Updated Vanuatu National Energy Road Map 2016-2030* (DoE, 2016) provides the following context to energy access in Vanuatu:

*Widespread access to energy underpins sustainable development. At a basic level, modern energy is used for the provision of clean water and sanitation, and for effective delivery of health care as well as educational and knowledge services. Widespread and affordable energy access can help provide reliable and efficient lighting, heating, cooking, mechanical power, and transport and telecommunication services. There is a strong correlation between low access to electricity and cooking fuels, and high poverty levels and low human development (and vice versa).*

*Relative to other countries (including in the Pacific Region), electricity access levels in Vanuatu are unusually low, and stand out in relation to the country's levels of poverty. For instance, countries like Tonga and Samoa (which have a comparable poverty prevalence to Vanuatu) have achieved far higher national access rates for electricity. There is also limited access to modern cooking fuels (electricity, liquefied petroleum gas (LPG), kerosene*

An estimated 30 percent of the Vanuatu households and public institutions have access to electricity via connections to a grid network. Only four islands benefit from a grid network; however, the share of those without access to electricity remains high: Efate (24 percent), Malekula (84 percent), Santo (65 percent), and Tanna (86 percent). There is also a severe imbalance in access between urban and rural areas; the population without access in rural areas ranges between 83-85 percent in Tafea and Shefa province, 89 percent in Sanma province, 92 percent in Malampa province and 97 percent in Torba province (2009 Census).

Of the 50,740 total households nationwide, an estimated 21,500 are in grid-concession areas or in adjacent areas feasible for grid-extension on Efate, Malekula, Santo or Tanna. The remaining 29,240 households are in areas termed "off-grid". Approximately 30 percent of off-grid household are relatively concentrated and may be more likely to benefit from a micro or mini-grid configuration, powered by local resources, such as solar, hydro and other renewable energy technologies where available, diesel gensets, or hybrids of the two. In addition to the off-grid households, some 560 schools, health centres, dispensaries, post offices and aid stations provide vital services to poor and isolated communities. The remaining households are in dispersed off-grid areas that are located beyond the economic grid extension areas, and those that are too dispersed across the off-grids areas to be considered for isolated micro and mini-grid configurations.

The Government of Vanuatu is working with the World Bank to implement the Vanuatu Rural Electrification Project Stage 2 (VREP II) to scale-up access to electricity services in rural areas through financing of micro- and mini-grid installations. VREP II builds on the Project's first stage (VREP I) which is financing "plug and play" systems for approximately 17,500 rural households, aid posts and community halls. Both VREP I and VREP II are investments under the Scaling Up Renewable Energy in Low Income Countries Program (SREP). SREP is a funding window under the Climate Investment Funds (CIF) and seeks to support scaled-up deployment of renewable energy solutions to increase energy access and economic opportunities in developing countries. Under the *SREP Investment Plan for Vanuatu* (Government of Vanuatu and Climate Investment Funds, 2014) potential renewable energy resources were evaluated against national and SREP criteria and one of the investment priorities that emerged was "*Individual solar systems and micro/ mini-grids for rural electrification*". Hence, the VREP II project design is consistent with the SREP Investment Plan.

## **B. PURPOSE AND SCOPE OF THE ESMF**

This ESMF has been prepared as the specific locations and detailed information about the micro- and mini-grid subprojects will not be known until project implementation. The Government of Vanuatu (GoV) will identify potential locations for micro and mini grids 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, for example hydro, for feeding into the mini-grids in future.

These potential locations will be compiled into a long list. Communities in the long listed sites will be invited by the GoV to elect to receive a micro or mini-grid to be financed under VREP II. The purpose of this ESMF is to guide the implementing agency – Department of Energy (DoE) - on the environmental and social screening and subsequent environmental and social assessment of subprojects during project implementation.

The VREP has been classified as Environmental Category B.

The procedures outlined in the ESMF serve to ensure that potential adverse environmental and social impacts that may result from subproject activity are identified early, and appropriate safeguard instruments are prepared prior to implementation to avoid, minimize, mitigate and, in cases where there are residual impacts, offset or minimize adverse environmental and social impacts. The ESMF also contains guidance on safeguard instruments that may be triggered by certain activities, such as an Environmental Assessment (EA, OP4.01).

The ESMF will outline the requirements for the application of the various WB Safeguard Policies so that environmental and social safeguard instruments consistent with the WB and national requirements are produced.

## C. PROJECT OBJECTIVE AND DESCRIPTION

The VREP II Project Development Objective (PDO) is to “...support increased penetration of renewable energy and increased access to electricity services for rural households, public institutions and businesses located in the dispersed off-grid areas.”. The PDO is consistent with the Department of Energy’s guiding vision which is: “*To energise Vanuatu’s growth and development through the provision of secure, affordable, widely accessible, high quality, clean energy services for an Educated, Healthy and Wealthy nation*”.

Electricity services in Vanuatu are delivered through three types of models: (a) independent “main grid systems” in the two main urban centres; (b) isolated “mini-grids” in lesser population concentrations, but where a grid supply system is still a technically and economically competitive option; and (c) decentralized energy service systems. Grid electricity in Vanuatu is supplied by two entities: Union Electrique du Vanuatu Ltd (UNELCO) under a concession and Vanuatu Utilities and Infrastructure Ltd (VUI) through a management contract with Government of Vanuatu (GoV). Grid coverage is limited to Port Vila, Efate and Luganville, Santo, as well as small parts the islands of Malekula and Tanna. The rural population usually accesses electricity through diesel generators or solar, however, some communities are supplied by small micro/mini-grid systems. The lower population density in rural areas, large distances between customers, lower electricity loads and high connection costs have meant that the extension or building of new electricity grids for supply to peri-urban and rural consumers remain uneconomic.

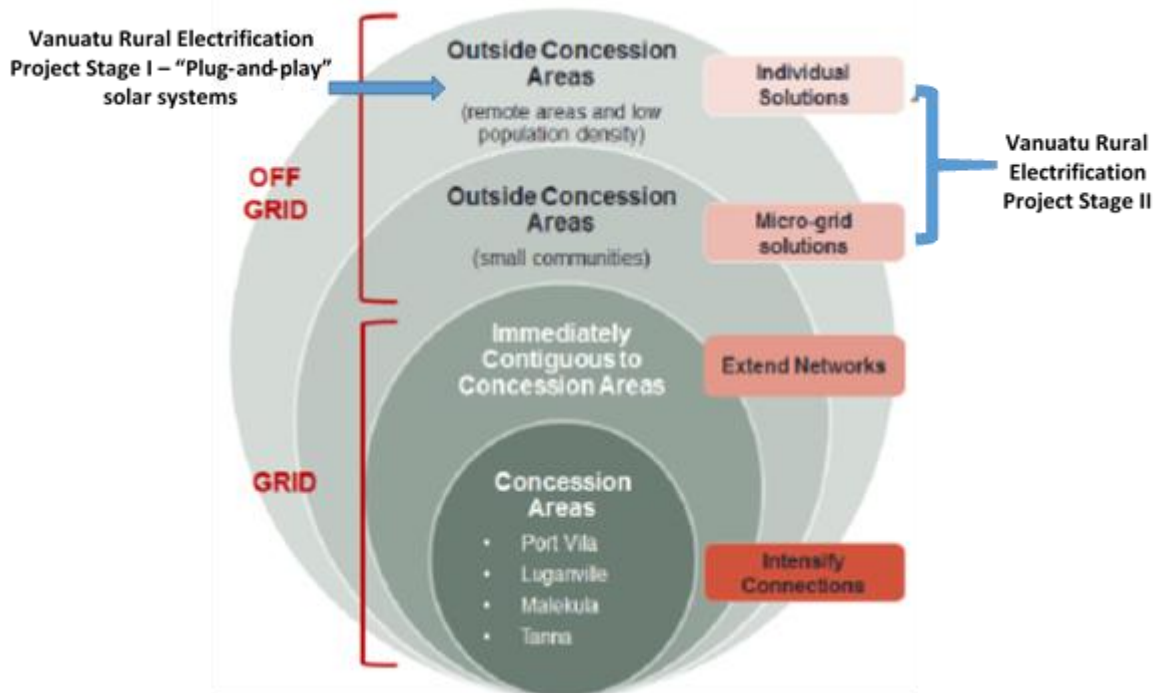
To continue Vanuatu’s socio-economic development, the Government of Vanuatu has prioritised the increased use of affordable, high quality forms of renewable energy. This is reflected in the strategic vision embodied in National Energy Road Map (NERM), which has been created and adopted as the guiding document for developing the energy sector in Vanuatu and lays the foundation for future energy sector policy and investment. By creating NERM, the Government of Vanuatu has put a high priority on energy development. It is making efforts to provide the rural population with increased electricity access as well as making electricity more affordable through greater use of indigenous energy resources (IRENA 2015). The NERM was approved by the Council of Ministers on June 27, 2013, and launched by Government in April, 2014. The NERM sets out three strategic directions for the sector:

1. Government leadership and commitment, to establish a comprehensive and consistent set of enabling policies, a strengthened legislative and regulatory framework, and targeted financing mechanisms;
2. Empowering and holding accountable key energy institutions, including effective energy sector institutions, the DoE, and the Utilities Regulatory Authority (URA); and
3. Implementing a sector-wide approach under the principle of “Many Partners, One Team, One Plan”.

Outside the utility concession areas, only 17% of rural households have access to electricity. Large scale implementation of cost-effective, pico-solar lighting schemes is the first step to getting rural electrification up and running. Affordable installations of this type can provide basic access to electricity for quality lighting and mobile phone charging and are greatly in demand from the rural population (IRENA 2015). The World Bank-financed VREP I project is providing access to these pico-solar, or “plug and play”, systems for 17,500 households.

Larger solar installations are to be installed in schools, health centres and other government facilities that need more electrical service than the pico-solar systems can provide. Technology is not the key challenge affecting rural electrification. Off-grid systems powered fully or partly by solar PV can undoubtedly provide the most cost-effective solution for remote rural electrification in areas distant from the grid and with low per capita demand. Figure 1 shows the configuration of the Vanuatu energy sector and the scope of World Bank financing.





**Figure 1 Vanuatu Energy Sector and World Bank Engagement**

VREP II includes three components:

- Component 1: Provision of solar home systems (SHS) and micro grids in rural areas of Vanuatu;
- Component 2: Construction of mini-grids in rural areas of Vanuatu; and
- Component 3: Project Management assistance.

### **C.1 Component 1: Provision of Solar Home Systems and Micro-grids**

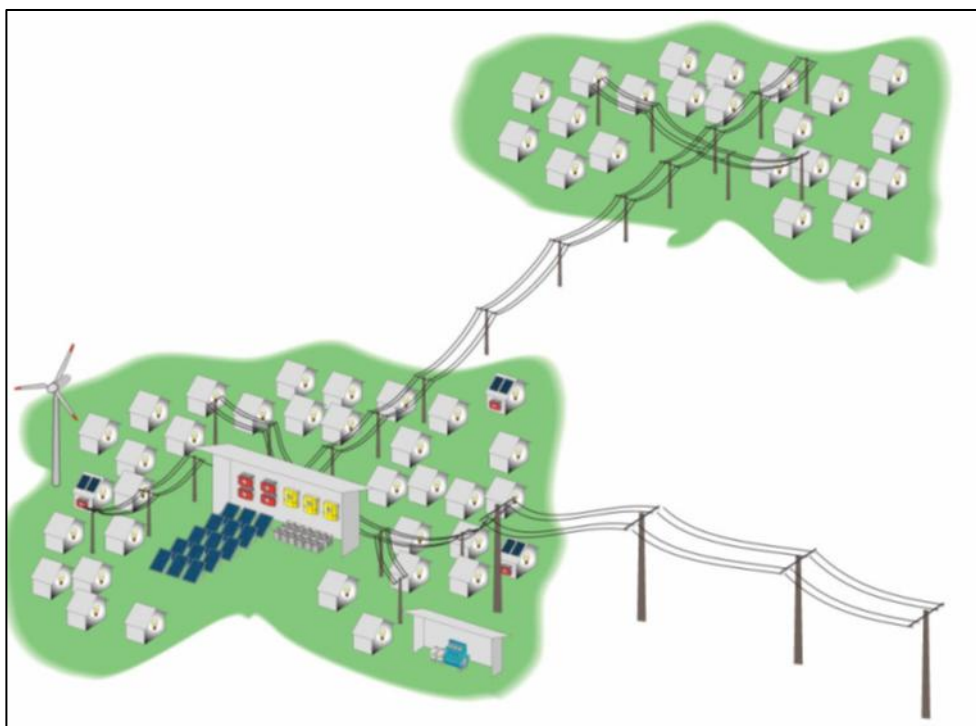
This component will support expansion of access to affordable and reliable electricity services through solar home system (SHS) and micro-grid configurations where mini-grid configurations are unlikely to be economically viable. SHS and micro-grids may include systems for household use (of varying capacity), or for community applications (for example electrification of a school, church or health centre) and may include solar water pumps or other similar applications. SHS are expected to be in the range of 0.5 kilowatt hours per day (kWh/day) to 2.2 kWh/day and will comprise solar panels for generation and household connection hardware. A 1.6 kWh/day system, for example, is expected to be sufficient to power 3 lights, phone, radio, laptop, TV and large DC refrigerator. SHS differ from “plug and play” systems in that they are of larger scale and involve fixtures such as roof-mounted solar panels. Micro-grids can be further differentiated in that they would involve simple distribution networks from a central solar generator (eg. connecting several school buildings). Both SHS and micro-grids would rely on battery storage and no back-up facility would be included.

### **C.2 Component 2: Construction of Mini-grids**

Under Component 2 the Government of Vanuatu (GoV) will identify potential locations for mini-grids 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 example

hydro, for feeding into the mini-grids in future. These locations will be compiled into a 'long list' from which sub-projects will be selected for financing under VREP II. 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 mini-grid solutions, the initial design will be based on solar photovoltaics (PV) with or without storage with biofuel/diesel backup. The installations will be modular, scalable with demand growth and will allow for other generation sources, such as small hydro, to be connected in future.

Figure 2 illustrates a hypothetical scheme that may be constructed under Component 2.



Source: SMA (2007)

**Figure 2 Hypothetical Mini-grid Layout**

Communities in the long listed sites will be invited by the GoV to elect to receive a mini-grid under the project. The threshold for eligibility is expected to be 75 households (or equivalent, eg. businesses). VREP II is a demand-driven initiative whereby communities elect to benefit from project outcomes and the sub-projects will be delivered in close partnership with the communities. The aim will be to site sub-project infrastructure on Government-owned land within the host village where it is available and suitable. Alternatively, Church-leased land will be considered. Where neither of these options is available, it is expected that communities electing to receive mini grids will provide access to community land (land donation) for the siting of the generation and distribution infrastructure, and back-up generator and battery storage. The World Bank's protocol for voluntary land donation (as documented in the RPF) will need to be satisfied to ensure land offered up by the community is truly communal and does not result in disadvantage to individual community members.

### C.3 Component 3: Project Management

Component 3 of VREP II will provide funding for project management costs. This will mainly be the cost of the Project Manager/Engineer who will be responsible for:

- final design, procurement (bidding and contracts/concessions) for the construction and operation of the facilities;
- supervision of the construction and commissioning works;

- supervision of safeguards implementation by sub-project contractors; and
- compliance and reporting.

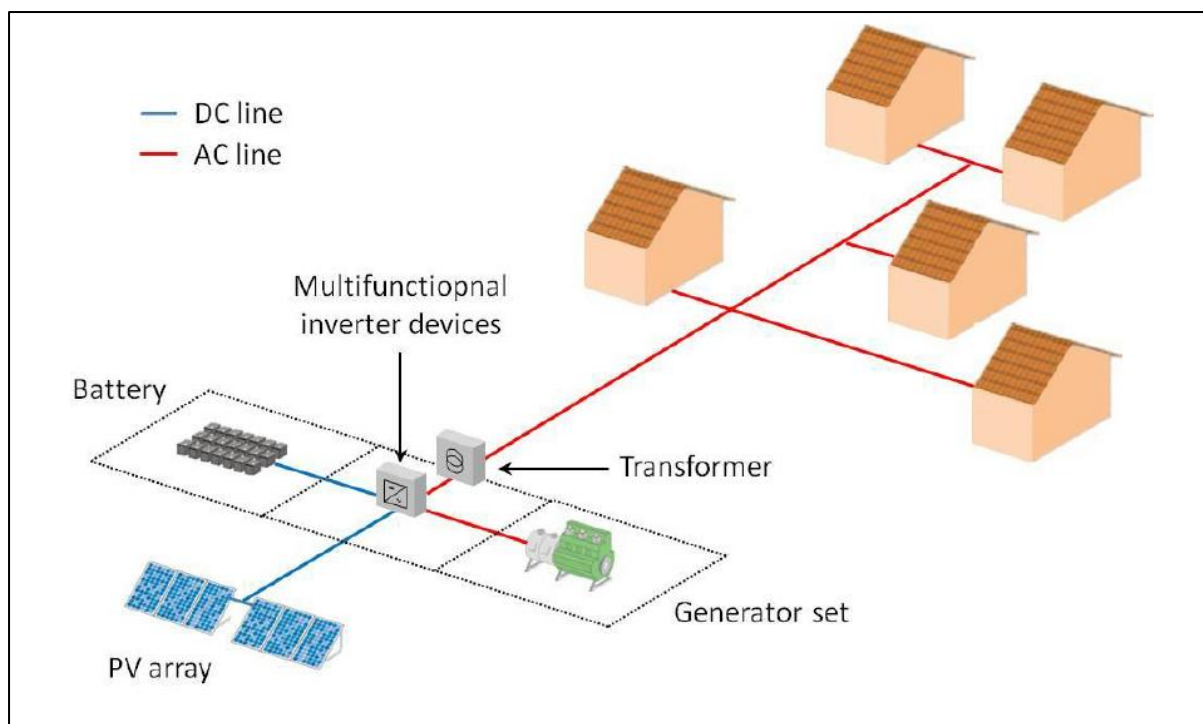
An “in kind” GoV contribution will cover the GoV’s direct project related costs, community consultation and support to the owners’ engineer on project implementation. DoE will be responsible for preparation of safeguards instruments for each sub-project and for securing permits under Vanuatu environmental and land legislation. Consultants will be engaged to prepare these instruments on DoE’s behalf and approval from the World Bank will also be required. Sub-project contractors will be responsible for preparing Contractor’s Environmental and Social Management Plans (CESMP) and the DoE Project Manager/Engineer will be responsible for oversight of CESMP implementation during the construction phase. DoE will also be responsible for community and stakeholder engagement throughout the project lifecycle.

#### **C.4 Subproject Typologies**

The focus of this ESMF is Component 2 which will involve the establishment of mini-grids in provincial villages and towns across Vanuatu. SHS and micro-grids under Component 1 will be subject to an Environmental Code of Practice (ECOP) that will be developed during implementation. A mini-grid can be defined as (TARA, 2013):

*“...a set of electricity generators and, possibly, energy storage systems interconnected to a distribution network that supplies the entire electricity demand of a localized group of customers. This power delivery architecture can be contrasted with single customer systems (e.g. solar home systems) where there is no distribution network interconnecting customers, and with centralized grid systems, where electrical energy is transmitted over large distances from large central generators and local generators are generally not capable of meeting local demand.”*

Although there are a range of potential mini grid solutions, the initial design will be based on solar photovoltaics (PV) with or without storage with biodiesel backup, i.e a hybrid generation system. A hybrid generation system combines two (or more) energy sources, operated jointly, generally including a storage unit and connected to a local alternating current (AC) distribution network (mini grid). As PV power output is DC and mini grids operate in AC, a hybrid system relies on an inverter device able to convert DC and AC currents, control the generation and storage systems and set up the voltage and frequency of the mini grid (IEA, 2013). Figure 3 shows the various system components.



Source: IEA (2013)

**Figure 3 Mini-grid Components**

The scale of the sub-projects to be financed under VREP II are defined by IEA (2013) as “...small hybrid systems...suitable for supplying the power needs of a small rural village where the energy consumption is quite limited; for instance a village with no, or very few, productive or commercial activities.” The system size is generally expected to be in the range 5 to 30 kilowatt-peak (kWp) catering for a village with a peak load in the range 30 kW to 60 kW, and a daily power consumption of 150 kWh to 300 kWh/day. However, larger-sized systems may be constructed.

These limited energy needs and low base load can typically be supplied by solar energy and a battery bank. The battery bank would store the equivalent of one day of solar energy generation. The peak load is generally in the evening due to lighting uses. To meet this peak, either the battery or the biodiesel genset is used. In addition, if the battery is low, the genset is automatically started and charges the battery simultaneously to supplying the customers (IEA, 2013).

Under VREP II, the back-up genset will be fuelled by biodiesel where available. This biodiesel will likely be produced from copra, which is relatively available in Vanuatu.



## D. POTENTIAL ENVIRONMENTAL AND SOCIAL IMPACTS

Micro 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 areas. The potential environment and social impacts are assessed based on the design, scope of work as well as the physical and biological environment of project site. Mitigation measures for each potential environment and social impacts are designed to avoid, minimize or remediate the impacts.

Sub-projects under VREP II will involve small-scale civil infrastructure involving simple construction techniques and small construction footprints. The following photograph illustrates the likely scale of physical infrastructure at the generation sites.



*Source: SMA (2007)*

In addition to the generation facilities, the energy distribution system will include power poles, low voltage distribution lines to individual households and household electricity meters as shown below.



## **D.1 Potential Environmental Impacts**

### **1. Construction Phase Impacts**

Potential construction phase impacts may include the following:

- soil erosion and sedimentation from active worksites during excavation activities for generation and distribution infrastructure;
- noise from construction machinery operation. Where surrounding buildings - especially hospitals, schools and houses - are close to the construction site, care must be taken to ensure that noise does not adversely affect building occupants;
- air quality impacts from operating machinery (i.e. fumes) and dust generation from earthworks;
- access restrictions to properties and other premises for short periods during installation of power poles and lines;
- generation of solid waste, which will be limited to packaging waste and material offcuts; and
- fuel and oil spills from operating machinery.

Standard civil construction mitigation measures will be applied to minimise these impacts including:

- clean water diversions around earthworks sites and minimising area of disturbance at any one time;
- adopting standard working hours and limiting the duration of noisy activities as necessary;
- maintaining machinery in good working order and watering down earthworks sites as necessary;
- storage of solid waste in receptacles and disposal at approved landfills; and
- provision of spill response kits and storage of fuel and oil in bunded enclosures or secure containers.

### **2. Operation Phase Impacts**

#### **Back-up Generator Fuel Management**

Back-up generators will require fuel for operation and this is expected to be biodiesel as far as practicable; however conventional diesel may also be used if biodiesel is not available. Biodiesel production plants exist on some islands in Vanuatu, however conventional diesel is imported and distributed across the archipelago from Port Vila.

Hydrocarbon-based fuels have the potential to cause significant environmental impacts if spills enter groundwater or surface water bodies. Spill risk is associated with bulk fuel handling and transport (eg. ship-to-shore), storage at site and refuelling activities. Furthermore, empty fuel drums have the potential to cause waste impacts if not recycled or properly disposed of at a waste management facility.

Vanuatu has established bulk fuel distribution infrastructure with adequate port facilities and ground transport available on each island. At individual generator sites, fuel will be stored in covered bunded enclosures (most likely inside a generator shed) to ensure any accidental spills are fully contained. Empty fuel drums will be returned to the supplier.

## Used Batteries

A central component of any remote solar power system such as those proposed under the project is the use of rechargeable batteries. These batteries store the power generated during the daylight hours for later use. Rechargeable batteries include lithium-ion (Li-ion), nickel metal hydride (NiMH), nickel cadmium (Ni-Cad) and lead acid batteries (LAB). Of these, Ni-Cad and LAB have the greatest potential for environmental impacts.

These batteries, if improperly transported, stored and disassembled/recycled, can create long lasting environmental impacts due largely to the chemicals and heavy metals - such as mercury, lead, cadmium and nickel - contained within them. If released into the environment (via incineration and/or leakage and leaching etc.) these chemicals and heavy metals can create a number of health impacts including headaches, abdominal discomfort, seizures and comas. In addition, the environmental impacts can be significant.

The main components of a lead-acid battery are lead (Pb) electrodes and lead dioxide (PbO<sub>2</sub>) electrodes immersed in a solution of water and sulfuric acid. These are generally contained in a plastic case made from polypropylene. Sulfuric acid is extremely corrosive and is also a good carrier for soluble lead and lead particulate.

Lead is a highly toxic metal that produces a range of adverse health effects particularly in young children. Exposure to excessive levels of lead can cause brain damage; affect a child's growth; damage kidneys; impair hearing; cause vomiting, headaches, and appetite loss; and cause learning and behavioural problems. In adults, elevated lead levels can increase blood pressure and can cause digestive problems, kidney damage, nerve disorders, sleep problems, muscle and joint pains. Foetuses, infants, and children are especially vulnerable to lead exposure compared with adults, since lead is more easily absorbed into growing bodies. Also, the tissues of small children are more sensitive to the damaging effects of lead (SPREP, 2003).

Both nickel and cadmium which are the central components to Nickel-Cadmium (Ni-Cad) batteries have potential negative impacts on both the environment and on human health. While the effects of nickel are generally less severe (in the absence of long term exposure to airborne nickel dust) and limited to skin irritations, cadmium is a carcinogen, which can lead to renal dysfunction and bone defects.

In response to the battery management issue the DoE has prepared an Environmental Code of Practice (ECOP) for Used Battery Disposal (DoE, 2014). This ECOP was developed specifically for all equipment to be financed under the VREP (including VREP II); namely solar PV systems of generally in the range of 5 Watts to 30 Watts peak capacity. The ECOP prescribes a management regime for the management and disposal/recycling of used Ni-Cad and Lead Acid Batteries including collection, transport, storage and disposal of these types of batteries at the end of their useful life.

The ECOP states in the overview:

*"Since legislation and regulations on disposal of solid wastes, such as lead acid batteries, is in early stage of development, this project-specific ECOP has been developed for the collection, transport, storage and disposal of used batteries. It is anticipated that this project-specific ECOP will supplement and accompany more detailed national legislation and regulations for disposal of solid wastes, including batteries during the Project period."*

Subsequently the document states that:

*"...the ECOP addresses management of spent/used batteries for a period of time until Vanuatu's waste management legislation and capacity is improved to a point where the ECOP becomes obsolete. To this end, the ECOP seeks to inform discussion and build awareness around battery management to assist continual improvement in battery management for in the country."*

These statements are apparently contradictory in that they advocate for the ECOP to “...*supplement and accompany more detailed national legislation and regulations...*” but also suggest the “...*ECOP becomes obsolete*”.

Vanuatu’s *Pollution Control Act* has recently been redrafted and associated Regulations have been proposed for battery management. Notwithstanding, it is suggested that there is still a place for an ECOP to provide the detailed guidance necessary for the lifecycle management of used batteries.

### **End-of-life Solar Panels**

An emerging issue with solar PV energy systems is exhausted solar panels. The deployment of PV technology has grown dramatically in recent years, reaching a cumulative global installed capacity of 222 GW at the end of 2015. PV offers economic and environmentally friendly electricity production but like any technology it ages and ultimately requires decommissioning which includes dismantling, recycling and disposal (IRENA and IEA-PVPS, 2016).

Crystalline silicon (c-Si) PV panels – which are the most common current technology – have a lifespan of approximately 25 years. Typically c-Si panels contain about 76% glass (panel surface), 10% polymer, 8% aluminium (mostly the frame), 5% silicon (solar cells), 1% copper (interconnectors) and less than 0.1% silver (contact lines) and other metals (mostly tin and lead). Most of these materials are classified non-hazardous with the focus more on avoidance of landfill waste and opportunities for recycling. The smaller constituents of c-Si panels can present recycling difficulties since they contain silicon, silver and traces of elements such as tin and lead (together accounting for around 4% of the mass). Thinfilm panels (9% of global annual production) consist of more than 98% glass, polymer and aluminium (nonhazardous waste) but also modest amounts of copper and zinc (together around 2% of the mass), which is potentially environmentally hazardous waste. They also contain semiconductor or hazardous materials such as indium, gallium, selenium, cadmium tellurium and lead (IRENA, 2016).

The Used Battery ECOP could potentially be expanded in future to include management and recycling of end-of-life solar panels.

## **D.2 Potential Social Impacts**

The overall social impact of the project is expected to be strongly positive, with the provision of electricity supply to and rural settlements having numerous benefits. These benefits include the provision of basic services with resulting improved health outcomes amongst the beneficiary population.

Consultations were undertaken during the preparation of the ESMF with Tautu village residents (Malekula Island, Malampa Province) on 11 August 2016. Tautu village is part of a larger network supplied by the 500 kW Lakatoro power station with supply connected in the early 2000s. Tautu village represents the size that will be eligible for financing under VREP II. Residents described the following social benefits accruing from the provision of electricity:

- cost savings from eliminated kerosene use in hurricane lamps which was the previous light source;
- refrigeration allowing local shops to stock perishable goods and avoiding the need for residents to pay for transport to town procure these goods;
- access to modern technology including computers for school-age children and more reliable lighting to allow studying;
- access to knowledge and the “modern world” through internet connection;
- access to entertainment such as television and music;



- ability for women to access labour-saving devices such as sewing machines, washing machines and rice cookers; and
- street lighting and community facility lighting allowing for community gatherings.

The residents noted, however, that the use of higher energy-demand devices such as rice cookers resulted in higher tariff charges and hence there was a trade-off between convenience and extra power costs. Fundamentally, however, it was the provision of more reliable and cost-effective lighting that was the greatest benefit.

Some sub-projects, however, could have minor adverse social impacts on local communities and households. Such adverse impacts and risks could include:

- impacts during construction activities, including loss of assets such as trees and standing crops;
- social exclusion, based on an inability to afford access to the expanded electricity services. Vulnerable individuals could include widows, single mothers, orphans, disabled persons, and women more generally; and
- indebtedness, in particular due to the high cost of energy via self-reliant electricity systems.

The sub-projects will aim to identify and optimise the potential local benefits within the recipient communities where they will be implemented. Such benefits could include creation of opportunities to employ local businesses and workers in subproject construction, operations and maintenance activities and also to provide training and skills development opportunities.

The sub-projects will also aim to provide electricity to social infrastructure within communities - such as health clinics and schools - and to provide street lights to enhance community safety, particularly for women and children

### **Land Acquisition and Involuntary Resettlement**

The fundamental premise of the project in relation to land is that sub-projects are demand-driven with communities electing to receive micro or mini grids providing access to community land (land donation) for the siting of the generation installations and distribution network. The World Bank's consultation and documentation requirements relating to voluntary land donation 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 (eg. are required to relinquish productive land meaning they are worse-off as a result).

The approach adopted by the project will focus on avoiding any need for customary land. As far as practicable infrastructure will be sited on Government-owned or church-leased land within villages. Subprojects requiring involuntary resettlement will be ineligible for project financing at the eligibility screening stage.

## E. LEGAL, POLICY FRAMEWORK AND REGULATORY REQUIREMENTS

### E.1 COUNTRY LEGISLATION AND GUIDELINES

#### 1. *Environmental Legislation and Guidelines*

##### **Environmental Protection and Conservation Act 2002**

The is administered by the Department of Environmental Protection and Conservation (DEPC) and provides “...for the conservation, sustainable development and management of the environment of Vanuatu, and the regulation of related activities.” Specifically the Act introduces the requirement for environmental assessment and provides for the conservation of biodiversity and the establishment of protected areas in Vanuatu. Under the Act all development, other than residential buildings or custom structures, requires some form of environmental assessment to determine whether the development is “...likely to cause significant environmental, social and/or custom impacts” (clause 12). Where a significant impact is likely an Environmental Impact Assessment (EIA) is required. Projects with certain environmental or social impacts will require an EIA including those that (clause 13):

- a) *affect coastal dynamics or result in coastal erosion;*
- b) *result in the pollution of water resources;*
- c) *affect any endemic, protected, rare, threatened or endangered species, its habitat or nesting grounds;*
- d) *result in the contamination of land;*
- e) *endanger public health;*
- f) *affect important custom resources;*
- g) *affect protected or proposed protected areas;*
- h) *affect air quality;*
- i) *result in the unsustainable use of renewable resources;*
- j) *result in the introduction of foreign organisms and species;*
- k) *result in any other activity prescribed by regulation.*

All projects are subject to a Preliminary Environmental Assessment (PEA) to be undertaken by the DEPC Director (clause 14). The PEA is used by the Director to screen the project and determine if there is a need for an EIA.

The project proponent must apply to the Director in accordance with the *Environmental Impact Assessment Regulations 2012* using the *Application for Environmental Permit* together with the required supporting information and plans. There are three outcomes from the PEA:

1. Environmental Impact Assessment (EIA) is required;
2. No EIA required, but conditions are placed on the approval of the PEA; or
3. No EIA required and no conditions.

EIA and accompanying Environmental Management and Monitoring Plan (EMMP) are required for projects likely to cause significant environmental, social and / or custom impacts. DEPC advises the applicant, after undertaking the PEA, whether an EIA and EMMP is required. The Department can also require that a proponent prepares an EMMP without an EIA. The DEPC statutory timeframe for undertaking the PEA is 21 business days.

Under clause 13 of the Act “any additions to an existing residential dwelling, being additions that are used only for residential purposes and are at least 30 metres from any river, stream,

or from the line of mean high water spring tide” are not subject to an EIA. Solar home systems (SHS) and micro-grids supplying an existing residential dwelling are considered to be “additions” and hence will not be required to secure a permit under the EPC Act. Micro-grids supplying power to other than single residential dwellings (eg. schools, churches etc.) will require a permit.

### **Environmental Impact Assessment Regulations 2012**

The *Regulations* specify particular activities which require a PEA and establish the procedures for applying for a PEA. Clause 3 of the Regulations requires that:

*(1) An application for a PEA must:*

- (a) be submitted by the project proponent to the Director in a form approved for that purpose by the Director; and*
- (b) be accompanied by the prescribed application fee; and*
- (c) include any information, plans, specifications and other document and information that the Director may require.*

Schedule 1 of the Regulations specifies activities requiring a PEA and this includes:

*(9) Energy generation facilities and other infrastructure services, including the construction or alteration of any of the following:*

- (a) hydropower facilities;*
- (b) power stations;*
- (c) wind energy facilities;*
- (d) geothermal activities;*
- (e) pipelines.*

Importantly, no development can commence without an approval from the DEPC. The Director of the DEPC may issue a notice to stop or restrict the activity if the approval conditions are not being met.

### **Pollution Control Act 2013**

The objectives of this Act are to minimize and manage the discharge and emission of pollution and encourage all levels of government to work together to control the discharge and emission of pollution.

The Act has recently been amended to include a new Part 4A dealing with safety standards for storage, handling, transport and supply of petroleum. The new provisions include requirements for licensing, preparation of guidelines and standards, and monitoring and inspection. The amended Act is pending approval of Parliament.

Clause 8 imposes a requirement on owners and occupiers of premises to comply with prescribed standards for the discharge of pollution, wastewater and the emission of noise, odour or electromagnetic radiation and Clause 9 establishes a permit scheme for the discharge or emission of pollutants and creates offences for the discharge or emission of pollutants without a permit.

### **Waste Management Act 2014**

The Waste Management Act sets out a management and licensing system for waste handling and disposal and is partially implemented and administered by the DEPC with some responsibilities devolved to provincial and municipal councils including the development of waste management plans. VREP II subprojects will be required to manage

waste in line with the Act and waste management plans or licensed operators if these are established in the subproject areas.

## **2. Land Legislation and Guidelines**

### **Land Acquisition Act No. 5 1992**

This is the key statute directly related to land acquisition and gives the Minister for Lands and Natural Resources powers to acquire land on the Government's behalf. It provides for compensation for damages made during the process of land valuation, compensation entitlements for land and for rents and business losses, basic rights for grievance and appeals, and notice periods.

### **Land Reform Act 35**

This Act specifies that all land titles will be customary or transferred to the traditional owners, whose percentage can be traced back locally to 200 years. It specifies rights and obligations of indigenous owners and the non-indigenous land users.

### **Customary Land Management Act 2014**

This Act details management of customary land including the dispute resolution process through Nakamal and land tribunals and the process for affected persons to appeal the Nakamal or tribunal's decisions.

### **Land Leases Act 1983**

This Act details the rights and obligations of person or entities entering into an arrangement or agreement with another person and/or entity for the use of land under a lease or rent agreement.

## **3. Energy Policy**

### **National Energy Policy Framework**

The Vanuatu National Energy Policy Framework is focused in areas such as the promotion of energy efficiency and conservation, promotion of renewable energy sources and the provision of electricity to rural and remote areas. The ultimate goal of the Framework is to provide a long term development plan for the energy sector and the provision of reliable and affordable energy services to all people in Vanuatu.

### **Updated National Energy Road Map 2016-2030**

Vanuatu's National Energy Road Map (NERM) was considered and endorsed by the Council of Ministers in 2013. The NERM is the policy framework for developing the energy sector in Vanuatu. The NERM (2013) identified five priorities for the energy sector: access, petroleum supply, affordability, energy security, and climate change. It set out objectives, targets and actions to achieve these priorities and contribute to the NERM's overall vision.

The NERM was updated in 2016 to reflect recent developments but retains the same vision as the 2013 version of the NERM, and its objectives, targets, and actions are intended to be consistent. The Updated NERM provides more detail on particular areas (especially energy efficiency and green growth), and improve consistency of the priorities and objectives. To achieve the NERM's vision, the Updated NERM focuses on five priorities: accessible energy, affordable energy, secure and reliable energy, sustainable energy, and green growth. These five priorities are used to categorise the key objectives of the NERM; objectives that will be pursued only where the technologies are proven and the benefits exceed the costs.

### **Scaling-up Renewable Energy Program**

The Scaling-up Renewable Energy Program (SREP) Investment Plan for Vanuatu was endorsed by the Council of Ministers and the SREP Sub-committee in 2014. The SREP

Investment Plan put forward for consideration for funding through the Strategic Climate Fund two projects:

- the proposed project to build on the World Bank supported Vanuatu Rural Electrification Project to include micro and mini-grids; and
- investment in two small hydro projects through the Asian Development Bank to increase renewable energy in Vanuatu's electricity generation mix and also provide access to households and businesses who are currently not connected to the electricity grid.

The SREP part-finance VREP II in conjunction with World Bank International Development Association (IDA) and Government of Vanuatu in-kind contributions.

### **Environmental Code of Practice (Used Battery Disposal)**

The Environmental Code of Practice (ECOP) (June 2014) was developed specifically for solar PV systems generally in the range of 5 Watts to 30 Watts peak capacity financed under VREP. The key environmental issue with these systems is the appropriate management and disposal/recycling of used Ni-Cad and Lead Acid Batteries. To ensure effective application of the World Bank's environmental safeguard policies and to support the national regulatory requirements, the ECOP provides guidance on the approach to be taken to the collection, transport, storage and disposal of these types of batteries at the end of their useful life.

The ECOP addresses management of spent/used batteries until new regulations are established under the Waste Management Act.

### **4. Other Legislation**

Other Government of Vanuatu legislation of relevance to the project includes:

- *Employment Act* which is concerned with worker health and safety. The Act is administered by the Department of Labour; and
- *Maritime Act* dealing with the safety of vessels including barges carrying materials and equipment. This Act is administered by the Ministry of Infrastructure and Public Utilities (MIPU).

## **E.2 WORLD BANK POLICIES AND GUIDELINES**

The World Bank has developed a series of operational policies (OP), or safeguards, to help identify, avoid, and minimize harms to people and the environment. These safeguards require borrowing governments to address certain environmental and social risks in order to receive Bank financing for development projects. Eight OPs apply to environmental and social risks and, of these, two are triggered by VREP as described below.

### **1. OP 4.01 Environmental Assessment**

The World Bank requires environmental assessment (EA) of projects proposed for financing to help ensure that they are environmentally sound and sustainable, and to improve decision making. While the sub-project investments are generally expected to have only limited environmental and social impacts this policy is triggered to ensure an appropriate level of EA is undertaken. For each mini-grid sub-project under Component 2 an Environmental and Social Impact Assessment (ESIA) will be prepared with the level of assessment commensurate with the complexity and potential impacts. Sub-projects under Component 1 will not require an ESIA; however will be subject to an Environmental Code of Practice (ECOP) which will be developed from that prepared under VREP 1. This ECOP will be developed during implementation.

The project will involve siting of modular solar/battery/biodiesel hybrid systems, installation of solar panels, and construction of distribution systems on land donated by the communities. The installations will be carried out in rural communities. Solar panels will be installed either on rooftops 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 the future disposal of batteries where used.

## **2. OP 4.12 Involuntary Resettlement**

World Bank experience indicates that involuntary resettlement under development projects, if unmitigated, often gives rise to severe economic, social, and environmental risk:

- production systems are dismantled;
- people face impoverishment when their productive assets or income sources are lost;
- people are relocated to environments where their productive skills may be less applicable and the competition for resources greater;
- community institutions and social networks are weakened;
- kin groups are dispersed; and
- cultural identity, traditional authority, and the potential for mutual help are diminished or lost.

This policy includes safeguards to address and mitigate these impoverishment risks. Involuntary resettlement may cause severe long-term hardship, impoverishment, and environmental damage unless appropriate measures are carefully planned and carried out.

For these reasons, the overall objectives of OP 4.12 are the following:

- involuntary resettlement should be avoided where feasible, or minimized, exploring all viable alternative project designs;
- where it is not feasible to avoid resettlement, resettlement activities should be conceived and executed as sustainable development programs, providing sufficient investment resources to enable the persons displaced by the project to share in project benefits. Displaced persons should be meaningfully consulted and should have opportunities to participate in planning and implementing resettlement programs; and
- displaced persons should be assisted in their efforts to improve their livelihoods and standards of living or at least to restore them, in real terms, to pre-displacement levels or to levels prevailing prior to the beginning of project implementation, whichever is higher.

Since the Project will rely on land donation by the communities, it is anticipated that any impacts on land will be minimal. All land related issues will be addressed via negotiated arrangement (willing buyer-willing seller or voluntary land donation etc.) and the distribution network will traverse either public land or along corridors agreed between DoE, the community and land owners. 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.

This ESMF and the Resettlement Policy Framework (RPF) have been developed in accordance with the World Bank safeguard requirements to guide implementation.

### **3. Environmental Health and Safety Guidelines**

The World Bank Group's Environmental, Health and Safety (EHS) Guidelines are technical reference documents with general and industry-specific examples of Good International Industry Practice (GIIP). When one or more members of the World Bank Group are involved in a project, these EHS Guidelines are applied as required by their respective policies and standards. The General EHS Guidelines are designed to be used together with the relevant Industry Sector EHS Guidelines which provide guidance to users on EHS issues in specific industry sectors.

The EHS Guidelines contain the performance levels and measures that are generally considered to be achievable in new facilities by existing technology at reasonable costs. The applicability of the EHS Guidelines should be tailored to the hazards and risks established for each project on the basis of the results of an environmental assessment in which site-specific variables, such as host country context, assimilative capacity of the environment, and other project factors, are taken into account. The applicability of specific technical recommendations should be based on the professional opinion of qualified and experienced persons. When host country regulations differ from the levels and measures presented in the EHS Guidelines, projects are expected to achieve whichever is more stringent.

The General and Industry Sector EHS Guidelines are available at the following link - <http://www.ifc.org/ehsguidelines>. Contractor's will be required to prepare an Occupational and Community Health and Safety Plan for each sub-project under Component 2. For sub-projects under Component 1 safety principles will be incorporated in the ECOP.

### **E.3 GAP ANALYSIS**

There are few gaps between the EPC Act process and the requirements of OP4.01 Environmental Assessment. Mitigation requirements are similar under the EPC Act environmental permit process and the ESMF. There are some gaps in the regulations regarding the types of activities that may require an environmental permit (for example, solar generation is not explicitly referenced). In any case, all such activities will have an environmental permit application form completed so they will be assessed by DEPC under the EPC Act. The exceptions are SHS and single residential dwelling micro-grids as described in Section E.1.

Under the EPC Act there is the requirement for an environmental permit for developments that may impact the environment and an ESIA for significant impacts. There is often no requirement for an ESMP for activities with minor or moderate impacts as these are controlled by EPC Act permit conditions. However, ESMPs can and have been used to demonstrate how environmental and social risks are to be managed.

In this project, each subproject under Component 2 will require an application for an environmental permit to ensure that the EPC Act is correctly applied. Under Component 1 only micro-grids supplying other than single residential dwellings will require a permit. The processes will be harmonized as much as possible, so that the requirements of Vanuatu and the World Bank will be met with any safeguard instrument that is prepared.

## **F. PROCEDURES TO ADDRESS ENVIRONMENTAL AND SOCIAL ISSUES**

This section describes the procedures in place to determine: (i) the categorization of the project activity based on potential adverse environmental and social impacts of project activities, and (ii) how potential impacts will be addressed through the selection of appropriate mitigation and management plans. Approved subproject activities must be consistent with these procedures.

### **F.1 Environmental and Social Safeguard Procedures**

The procedure for identifying and assessing safeguard impacts of project activities and assessing impact mitigation measures is outlined below. These steps aim to ensure that the Government of Vanuatu and World Bank's safeguard policies are followed.

#### **Step One – Eligibility Screening**

Subprojects with the potential to cause significant impacts on natural habitats or requiring involuntary land acquisition will not be eligible for financing. Annex 1 includes a screening form for determining if sub-projects have the potential to cause significant environmental or social impacts.

#### **Step Two – Scoping and Evaluation of Alternatives**

Scoping will identify the specific activities which are envisaged under the sub-project; any known environmental sensitivities; any sites with known or potential cultural, heritage or unique natural values that may involve environmental and social impacts and may require discussion with knowledgeable expert/s and local stakeholders. Potential significant impacts on these sites will be avoided by design.

Following scoping an evaluation of alternatives will be undertaken including:

- infrastructure siting – including generation facilities, with respect to sensitive receptors, flood risk and land acquisition requirements; and
- electricity distribution and connection – including avoidance cultural resources and requirement for land acquisition.

Preferred alternatives for individual schemes will be identified in consultation with local communities and other relevant stakeholders.

#### **Step Three – Technical Screening and Assessment of Subprojects**

All subprojects and activities are subject to the screening process using the Environmental and Social Impact Assessment Screening Checklist in Annex 1 to determine the potential environmental and social impacts. The screening form will determine the required safeguard instrument to be prepared according to the type of activity and possible level of impact or disturbance. As a minimum an Environmental and Social Impact Assessment (ESIA), incorporating an Environmental and Social Management Plan (ESMP), will be prepared for all sub-projects under Component 2 commensurate with the complexity and potential impacts.

#### **Step Four – Prepare Safeguard Instrument**

Following Step Three, the required documentation will be prepared (including TORs where these may be tendered out). Annex 2 provides an annotated table of contents for preparation of an ESIA (and ESMP) which will be required for all subprojects under Component 2. Guidance on preparation of social safeguards instruments is provided in the Resettlement Policy Framework (RPF). The safeguards instruments will be subject to DoE and World Bank review.

#### **Step Five – Assessment and Consultation**



Parameters for ESIAs and associated studies will be defined by DoE through ToRs. ESIAs will be undertaken by qualified specialists to identify the level of adverse impacts of subprojects and proposed activities prior to any works taking place.

### **Step Six – Implementation of Mitigation Measures**

Mitigation and management measures outlined in the ESMP (e.g. site selection criteria, diligent construction management, control measures) will be implemented by contractors and supervised by DoE PMU's supervising engineers. Performance indicators should be defined to ensure the effectiveness of measures in place, which can be monitored and reported on throughout the project lifecycle.

### **Step Seven – Monitoring and Reporting**

Monitoring is required to gather information to determine the effectiveness of implemented mitigation and management measures and to ensure compliance of the contractor with the approved EMP. Environmental indicators will be defined when mitigation measures are confirmed and the PMU's (with support from relevant agencies) will be tasked with monitoring compliance by contractors throughout implementation.

## **F.2 Environmental and Social Safeguards Instruments**

Under Bank requirements, an ESIA will be required for each subproject under Component 2. Assessments and proposed mitigation measures must consider potential for an inequitable impact on women or disadvantaged groups that need careful consideration. The proposed design must consider viable alternatives and the overall inclusivity with regard to gender and the needs of vulnerable groups or persons where applicable.

.

## **F.3 Land Acquisition**

Subprojects requiring compulsory land acquisition will not be eligible for financing. In consideration of the complex land acquisition arrangement in Vanuatu, the project has been designed to avoid to the greatest extent the need to use land other than Government owned land. Where non-Government land may be required, the project would screen out these subprojects from project support except in circumstances where individuals or customary groups would be able to donate the land or enter a negotiated agreement (such as a lease) with the Department of Energy. Involuntary land acquisition in Vanuatu is extremely time consuming and can lead to social unrest and substantial project delays.

Any land/or land use right required to facilitate the project would be acquired in accordance with the RPF included at Annex 4.

## **G. GRIEVANCE REDRESS MECHANISM**

During the course of the project it is possible that affected persons or communities may have concerns with the project's social or environmental implementation occurring during construction and possibly during operation. Any concerns will need to be addressed quickly and transparently, and without retribution to the affected parties.

World Bank funded projects are required to implement a grievance redress mechanism (GRM) to receive and facilitate resolution of affected peoples' concerns, complaints, and grievances about the project's performance, including concerning environmental and social impacts and issues. The mechanism ensures that: (i) the basic rights and interests of every affected person by poor environmental performance or social management of the project are protected; and (ii) their concerns arising from the poor performance of the project during the phases of design, construction and operation activities are effectively and timely addressed.

In the early stages of engagement, project stakeholders and affected communities must be made aware of:

- how they can access the GRM;
- who to lodge a formal complaint too;
- timeframes for response;
- that the process must be confidential, responsive and transparent; and
- alternative avenues where conflicts of interest occur.

The grievance process is based upon the premise that it imposes no cost to those raising the grievances; that concerns arising from project implementation are adequately addressed in a timely manner; and that participation in the grievance process does not preclude pursuit of legal remedies under national law. Local communities and other interested stakeholders may raise a grievance at any time to the DoE or the World Bank's Inspection Panel.

Communities and individuals who have grievances should first raise these with DoE via the office in Port Vila. Grievances should be addressed to:

Program Manager  
Vanuatu Rural Electrification Program (VREP)  
Department of Energy  
Ph: 25201/5333840

Communities and individuals who believe that they are adversely affected by a World Bank (WB) supported project may submit complaints to existing project-level grievance redress mechanisms or the WB's Grievance Redress Service (GRS). The GRS ensures that complaints received are promptly reviewed in order to address project-related concerns. Project affected communities and individuals may submit their complaint to the WB's independent Inspection Panel which determines whether harm occurred, or could occur, as a result of WB non-compliance with its policies and procedures. Complaints may be submitted at any time after concerns have been brought directly to the World Bank's attention, and Bank Management has been given an opportunity to respond. For information on how to submit complaints to the World Bank's corporate Grievance Redress Service (GRS), please visit <http://www.worldbank.org/GRS>. For information on how to submit complaints to the World Bank Inspection Panel, please visit [www.inspectionpanel.org](http://www.inspectionpanel.org).

## H. PUBLIC CONSULTATION AND INFORMATION DISCLOSURE

The key mechanism for citizen engagement will be site-specific consultations. These consultations will be held in each project location with invitations extended to the broad community with special focus on women, vulnerable groups, schools, medical centers, and small business owners. In order to have broad discussions on energy issues with the community, the costs and benefits of the project, opportunities for ensuring the project provides benefits across the community, and potential social risks from the project will be discussed.

### H.1 Consultation to Date

During the preparation of the ESMF consultation was undertaken with the following stakeholders:

- Department of Energy – on the statutory and policy context for VREP II and the associated technical components. This consultation included a field inspection to several sites on Malekula Island, Malampa Province;
- Department of Lands – David Stanley (Lands Enforcement Officer) provided advice on the preferred process for land acquisition for the sub-projects;
- Department of Environment – Jason Raubani (Director, Department of Environment) provided advice on the approvals regime under the *Environmental Protection and Conservation Act 2002* and *Environmental Impact Assessment Regulations 2012*; and
- Stakeholder Safeguards Workshop (Port Vila on 25 October 2016). This workshop - involving representatives from DoE, DEPC, Provincial Government, Council of Churches, UNELCO and VUI – provided an introduction to Government of Vanuatu and World Bank safeguards policies and proposed implementation arrangements as described in this ESMF.

### H.2 Village Level Consultation

The provision of SHS and micro grids will be demand driven with households, communities and businesses electing to purchase systems. The project will use the existing vendors' networks successfully established under VREP I (for distribution of "plug-and-play" solar systems) to reach rural communities across the country. Information on products will be disseminated through vendors and communities via a product catalogue, which will list products that vendors are selling and that are eligible under the subsidy mechanism. Vendors may also undertake direct marketing and road shows such as that for the VREP I.

For mini grids DoE will be responsible for inviting villages on the long list to elect to receive electricity through a mini grid 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. The Owners' Engineer will support the Department in the preparation and planning for the community engagement process. Emphasis will be placed on ensuring that women are engaged, and that all community members are informed and have a chance to participate in decision making.

### H.3 Information Disclosure

Information disclosure is mandated by OP4.01, OP4.12 and the Bank's Disclosure Policy. Dedicated channels for information dissemination will be established to ensure consistent communication at national, subnational and local levels throughout the Project. Safeguard instruments including the ESMF (and its Annexes) are disclosed in a language and format accessible to people, communities and civil society who may be interested in, or affected by, project activities to ensure sufficient understanding of the project activities, potential impacts and management arrangements, as well as the grievance redress mechanism.

Disclosure occurs as follows:

- project concepts are disclosed during the preparation phase to gather feedback and input from local communities and other stakeholders on the proposed activities and safeguard measures.
- assessment documents (e.g. ESIA) are disclosed during activities preparation and prior to their final review and approval;
- final safeguard documents are disclosed to inform local communities of implementation measures and how their concerns have been considered.

The DoE is responsible for managing information dissemination, overseeing public consultation and assuring compliance to guidelines and procedures set out by safeguard instruments and ensuring relevant personnel are trained. Project and sub-project safeguards instruments and other relevant information will be disclosed on the DoE website, with hard copies distributed to the relevant Provincial Government offices. For sub-projects involving mini grids executive summaries of ESIAs will be translated into Bislama. Similarly, documentation required under the RPF will be translated into Bislama.

## **I. PROJECT IMPLEMENTATION ARRANGEMENTS, RESPONSIBILITIES AND CAPACITY BUILDING**

### **I.1 Implementation Arrangements and Delivery Model**

Under Component 3 the project will provide project implementation support and technical assistance to strengthen DoE's environmental and social safeguards oversight capacity. An owner's engineer, hired by the Government of Vanuatu, will prepare the detailed designs, technical specifications and tender documentation for each mini grid system, support preparation of the necessary safeguard documents and supervise the construction of the mini grids and implementation of any Environmental and Social Management Plans. DoE will be responsible for negotiating land access and preparing documentation to meet the requirements of the Resettlement Policy Framework (RPF). The Owner's Engineer will be a firm hired through competitive selection. The Owner's Engineer will report to the Director, Department of Energy, with day to day supervision provided by the Program Manager for VREP.

The construction of each mini grid will be competitively tendered. The mini grids will be operated and maintained by a Service Provider, which may be the incumbent utilities (UNELCO and VUI) or a new private sector operator, under management contract until such time as the concessions come up for re-tender or the mini grids are "rolled into" the concession areas. The Tanna and Malekula concessions will be re-tender in 2020, and the Luganville concession on Espiritu Santo Island is being retendered with a provision in the concession agreement to periodically amend the concession to include new grid systems. The Port Vila concession is not up for re-tender until 2031, however it is not expected any mini grids will be constructed in areas contiguous to this concession area. The management contract will be negotiated and signed by the Service Provider and the Government of Vanuatu, and regulated by the URA.

### **I.2 Capacity Building**

The Department of Energy (DoE) is implementing other World Bank-financed energy projects and is familiar with the Bank's policies and procedures. Since 2011, DoE has grown from 1-2 staff to over ten (10) staff with support of a number of consultants funded under World Bank-financed projects. Hence, it is considered that project management capacity within DoE is sufficient to manage safeguards issues.

### **I.3 Monitoring and Evaluation**

At the project level, the results framework forms the basis to track the progress of activities and their outcomes towards meeting the DoE objectives. DoE will submit to the World Bank semi-annual reports that would provide an overview of the progress made and highlight issues that need attention.

Each sub-project Contractor's ESMP will include specific monitoring parameters with the monitoring to be undertaken by the Contractor. DoE will be responsible for reviewing and evaluating monitoring reports and instigating corrective action where required.

## REFERENCES

- Department of Energy (DoE) (2014) *Environmental Code of Practice for Used Battery Disposal for Rural Electrification Project Vanuatu*. June 2014
- Department of Energy (DoE) (2016) *Updated Vanuatu National Energy Road Map 2016-2030*. June 2016
- Government of Vanuatu and Climate Investment Funds (2014) *Scaling Up Renewable Energy in Low Income Countries (SREP) Investment Plan for Vanuatu*. October 2014
- International Energy Agency (IEA) (2013) *Rural Electrification with PV Hybrid Systems - Overview and Recommendations for Further Deployment*. International Energy Agency Photovoltaic Power Systems Program. July 2013
- IRENA (2015) *Vanuatu Renewables Readiness Assessment*. International Renewable Energy Agency. June 2015
- IRENA and IEA-PVPS (2016) *End-of-Life Management: Solar Photovoltaic Panels*. International Renewable Energy Agency and International Energy Agency Photovoltaic Power Systems.
- SMA Technologie AG (2007) *AC coupled Hybrid Systems and Mini Grids*. Presentation to ANZSES 45th Annual Conference Solar07, 2-6 October 2007, Alice Springs, Australia
- SPREP (2003) *Lead-Acid Battery Management*. Secretariat of the Pacific Regional Environment Program January 2003
- Technology and Action for Rural Advancement (TARA) (2013) *An Overview of Technical Aspects of Mini-Grids*. August 2013
- World Bank (2014) *Rural Electrification Project – Project Information Document*. July 2014

## ANNEX 1 - ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT SCREENING CHECKLIST

<b>Introduction</b>			
<p>This checklist must be completed for all sub-projects involving establishment of mini-grids under Component 2 and should be used to guide preparation of the Environmental and Social Impact Assessment (ESIA) and associated Environmental and Social Management Plan (ESMP). Sub-projects involving solar home systems (SHS) or micro-grids under Component 1 will be managed using an Environmental Code of Practice (ECOP) and this checklist does not need to be completed.</p> <p>The aim of this screening checklist is to draw attention to positive or negative environmental, social or custom impacts that could occur as a result of the proposed project. The checklist satisfies the requirements for an Environmental Permit application to Department of Environmental Protection and Conservation (DEPC) and guides the preparation of an Environmental and Social Impact Assessment (ESIA) under the World Bank's policy OP 4.01 Environmental Assessment.</p> <p>The questions are designed to direct attention towards issues that should be considered at the early stages of project planning and also during project construction and operation. DEPC will be using similar headings to assess the project so the more information that can be provided in this document, the more easily the application can be processed by DEPC officers. It is important that the following details are described in this template:</p> <ul style="list-style-type: none"> <li>• Current environment and the likely impacts of the project</li> <li>• Impacts of project construction and how these will be managed</li> <li>• Impacts of project operation and how these will be managed</li> </ul>			
<b>Section 1 – Project details</b>			
Project name			
Project proponent (developer)			
Proponent's email address			
Proponent's phone number			
Project location (including coordinates, if available)			
Type and purpose of project (brief description)			
<b>Section 2 – Size and scale of the proposed project</b>			
<i>Questions to be considered</i>	<i>Yes/no/N.A./brief description</i>	<i>Is this likely to result in a significant impact – yes/no? Negative or positive? Long-term, short-term or irreversible?</i>	<i>Does the potential impact need to be further investigated? Will it require management?</i>
2.1 What area of land and/or sea will be developed? (indicate size of area, in m2 or km2)			
2.2 Will a large amount of energy, water or other natural resources be required for project construction and operation?			
2.3 Will a large workforce be needed? Is a local and/or external			

workforce to be employed?				
2.4 What is the expected timeframe for the project? (including construction, operation, closure and decommissioning – if appropriate)				
2.5 What is the current land use of the site? What are the neighbouring land uses?				
<b>Section 3 – Character of the proposed project</b>				
<i>Questions to be considered</i>	<i>Yes/no/N.A./brief description</i>	<i>Is this likely to result in a significant impact – yes/no? Negative or positive? Long-term, short-term or irreversible?</i>	<i>Does the potential impact need to be further investigated? Will it require management?</i>	
3.1 What type of construction or operational activities will be undertaken by the project?				
3.2 Are the project activities novel (new) or have they been undertaken before within the country, or in the Pacific region?				
<b>Section 4 – Project Location (as proposed by community)</b>				
<i>Questions to be considered</i>	<i>Yes/no/N.A./brief description</i>	<i>Is this likely to result in a significant impact – yes/no? Negative or positive? Long-term, short-term or irreversible?</i>	<i>Does the potential impact need to be further investigated? Will it require management?</i>	
4.1 Is the project to be located within or adjacent to a vulnerable area (e.g. low-lying coastal area, waterways, floodplain, wetland, steep sloping land)?				
4.2 Is the project to be located adjacent to a sensitive site or facility (e.g. historical or archaeological site, conservation reserve, school, hospital/ medical facility)?				
4.3 Is the project likely to impact on existing land or sea uses/activities?				
4.4 Is the proposed site suitable for the project (e.g. appropriate set-back from the coast, streams or rivers; no steep or eroding slopes)?				
4.5 Is the proposed project site customary land? Are all customary land/ resource owners aware of the project proposal? Have they been consulted/meaningfully engaged?				
<b>Section 5 – Environmental Impacts</b>				
<i>Aspect of the</i>	<i>Questions to be considered</i>	<i>Yes/no/N.A./brief</i>	<i>Is this likely to result</i>	<i>Does the potential impact</i>



<i>environment</i>		<i>description</i>	<i>in a significant impact – yes/no? Negative or positive? Long-term, short-term, irreversible?</i>	<i>need to be further investigated? Will it require management?</i>
<b>5.1 Topography, geology and soils</b>	5.1.1 Destruction, covering or modification of any unique geological or landscape feature?			
	5.1.2 Soil contamination or disturbance of previously contaminated soils?			
	5.1.3 Disturbance of soils that are fragile, or susceptible to erosion or compaction?			
	5.1.4 Will dumping of spoil or removal of timber and vegetation, rock or soils affect land stability??			
	5.1.5 Will the immediate or downstream effects of the project impact on coastal areas (beaches, seabed, coral reefs, and sea grass beds) wetlands, lagoons or swamps?			
<b>5.2 Water</b>	5.2.1 Extraction or use of ground, surface or tank water resources, leading to reduction in the volume and quality of water available for the public water supply?			
	5.2.2 Pollution of ground, surface, coastal or sea water, via direct or indirect discharges or seepages; or through interception of an aquifer by drilling, cuts or excavations?			
	5.2.3 Will project construction involve any hazardous substances (including petrol, oils, tar, paints or industrial chemicals) to be used or stored on site??			
	5.2.4 Changes in runoff, drainage patterns or absorption rates?			
	5.2.5 Coastal, stream or river flooding?			
<b>5.3 Air</b>	5.3.1 Will the project construction cause dust? ?			
	5.3.2 Will there be any burning of materials on site?			
<b>5.4 Noise</b>	5.4.1 Will the project construction require the use of heavy or noisy machinery or equipment?			
<b>5.5 Plant life</b>	5.5.1 Damage to or clearing of vegetation communities (e.g. coastal vegetation, established forest, upland forest or mangrove communities)?			

	5.5.2 A reduction in agricultural crop production?			
<b>5.6 Animal Life</b>	5.6.1 Is the project site located on or close to the sea??			
	5.6.2 Is the project site located on or close to a river, stream or wetland?			
	5.6.3 Is the project site located in, close to or include a protected area??			
	5.6.4 Damage to or destruction of habitat for animal communities on land?			
	5.6.5 What animal and bird species use, are present on or close to the project site (eg megapode nesting sites, flying fox roost			
	5.6.6 Are there important or endangered species in the area of the project?			
<b>5.7 Natural resources</b>	5.7.1 The extraction, harvest or consumption of natural resources (e.g. timber, minerals, water)?			
	5.7.2 A noticeable increase in the rate of use of any natural resource?			
	5.7.3 Substantial depletion of non-renewable resources?			
<b>5.8 Human communities</b>	5.8.1 Are there existing homes, settlements or other activities present on or adjacent to the project site? ?			
	5.8.2 Influx of an external workforce or in-migration to the project area?			
	5.8.3 Demand for additional housing to accommodate an external workforce?			
	5.8.4 Is the area culturally or archaeologically sensitive??			
	5.8.5 Increased demand for and disruption to social services and infrastructure (e.g. water and energy supply, communications, sewage and waste disposal, fire protection, police, schools, medical care)?			
	5.8.6 Will waste products be generated during construction or operation? Will any waste products be treated or disposed of offsite??			
	5.8.7 Infringement on customs or customary rights?			

	5.8.8 Social change or impacts on traditional governance structures, resulting in community dislocation or loss of community cohesion?			
	5.8.9 Restrictions in access to customary areas or restrictions in resource use in customary areas?			
	5.8.10 Changes in access to or the quality of recreational opportunities?			
<b>5.9 Involuntary Resettlement</b>	5.9.1 Have all sites for physical works under the project been specified?			
	5.9.2. Does the project involve physical works that will require any change in land use?			
	5.9.3. If any physical works are sited on public land, do any persons use or occupy this land			
	5.9.4. Will any physical works be sited on communal or collective land? (a) If so, do any individuals use the land for their livelihood or residence? (b) Does the project plan to acquire the land through means other than market-based lease or purchase, or through voluntary donation?			
	5.9.5. Are any physical works sited on private land? If so, does the project plan to acquire the land through means other than market-based lease or purchase, or through voluntary donation?			
	5.9.6. Will any physical works otherwise restrict access to, or use of, land or natural resources?			
	5.9.7. Will any physical works require acquisition of more than 10 percent of a private land plot?			
	5.9.8. Will any physical works require demolition of any residential or commercial structure?			
<b>5.10 Local and national economy</b>	5.10.1 Local economic displacement or loss of livelihoods (including subsistence and informal economic activities)?			
	5.10.2 Creation of jobs/livelihood opportunities for locals?			
	5.10.3 Influx of the cash economy in areas where there was previously a subsistence-based economy?			
	5.10.4 Training or educational opportunities for locals?			
	5.10.5 Increased tax revenue for the national government?			

	Royalties or benefits for sub-national levels of government?			
	5.10.6 Benefits for directly affected people and communities (which may include direct economic benefits, community development programs etc.)?			
	5.10.7 Benefits for the broader community (e.g. upgrading of social services or infrastructure)?			
<b>Section 6 – Uncertainty surrounding potential impacts and risks</b>				
<i>Questions to be considered</i>		<i>Yes/no/N.A./brief description</i>	<i>Is further investigation required?</i>	
6.1 Are the potential project impacts and risks easily identified and well understood?				
6.2 Are cumulative impacts in the project's area of influence well understood and have they been properly analysed?				
<b>Section 9 – Broader policy and planning context</b>				
<i>Questions to be considered</i>		<i>Yes/no/N.A./brief description</i>	<i>Is further investigation required?</i>	
9.1 Are there particular goals, targets or obligations under government policies, plans or legislation that are relevant to this project?				
<b>Recommendation</b>				
<input type="checkbox"/> <b>Category A</b> The activity is likely to have significant adverse environmental and social impacts that are sensitive diverse, or unprecedented. If so, this sub-project is not eligible for financing.				
<input type="checkbox"/> <b>Category B</b> The activity has potential adverse environmental impacts on human populations or environmentally important areas--including wetlands, forests, grasslands, and other natural habitats--are less adverse than those of Category A projects. These impacts are site-specific; few if any of them are irreversible; and mitigation measures can be designed to minimize these impacts.				

<b>Certification</b> We certify that we have thoroughly examined all the potential adverse effects of this subproject. To the best of our knowledge, the subproject plan as described in the application and associated planning reports (e.g. ESMP, Resettlement Plan, if any, will be adequate to avoid or minimize all adverse environmental and social impacts.
<b>Name and qualifications:</b>
<b>Department and title:</b>
<b>Telephone number:</b>
<b>E-Mail address:</b>
<b>Signature:</b>
<b>Date:</b>
<b>EPM representative (name/signature):</b>

## **ANNEX 2 – CONTENTS OF AN ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT**

This Annex is derived substantially from *Strengthening Environmental Impact Assessment: Guidelines for Pacific Island Countries and Territories*. Apia, Samoa : SPREP, 2016.

### **Section 1 – Executive summary**

Present a concise, non-technical outline of the proposed project and each chapter of the ESIA report. Include the results of impact and risk assessments, the proposed environmental management and mitigation measures, and the conclusions reached.

Translate the executive summary into relevant local language(s) to support community interest and participation in the ESIA process.

### **Section 2 – Table of contents**

### **Section 3 – Glossary , list of acronyms/abbreviations**

### **Section 4 – Introduction**

Provide an **overview of the project and the proponent**, including information such as:

- Project name, background and general description
- Project purpose and objectives (including environmental performance objectives)
- Project justification (including project need)

### **Section 5 – Policy and legal framework**

Outline relevant policies, guidelines and laws that apply to the project and the approvals that need to be obtained from different government agencies, for instance:

- National, regional, provincial or customary laws and regulations
- Multilateral Environmental Agreements
- Industry sector plans, policies or codes of practice
- Health, safety, hazard and risk management standards
- Environmental policies of any financing/funding organisations involved in the project (in this case World Bank policies)

### **Section 6 – Project description and justification**

Present a detailed description of the project and provide justification for its development, covering (where relevant):

#### **6.1 Project details**

- Project footprint (i.e. location, size and layout), including a description of how the project sits within the landscape/seascape and its area of influence
- Maps of the project footprint and surrounding area of influence, illustrating its proximity to environmental features (e.g. topography, existing land/sea use, watercourses, resource deposits, towns/villages/settlements, transport infrastructure, natural/cultural/ecological assets)
- Project activities, components, infrastructure and design, including technology and equipment likely to be used
- Predicted resource and public infrastructure requirements, including rates of extraction or demand (e.g. energy, water, transport, minerals, hazardous materials),

and any competition for resources or infrastructure that may occur with other projects or the local community

- Workforce size and accommodation
- Predicted type and quantity of waste outputs (e.g. liquid and solid wastes, gas/air emissions)
- Implementation schedule, with key steps and tasks (e.g. timeline for construction, operation, decommissioning, rehabilitation, closure), and expected project lifespan
- Project cost estimates and funding sources, including any uncertainties or assumptions underlying the estimates

## **6.2 Analysis of Alternatives**

- Alternative project sites, designs, technologies, timelines; including alternatives that address environmental hazards and environmental change processes
- Advantages and disadvantages of alternatives (e.g. cost, availability of technology)
- Rationale for selection of preferred options

## **6.3 Project Benefits**

- Benefits accruing to the local area, island, country, region (e.g. new or upgraded physical infrastructure, improved environmental conditions, increased resource availability, employment/livelihood/training opportunities, tax revenue, royalties, better health or educational facilities, community development programmes)
- Project relevance in the light of existing local or national development and/or future development plans

## **6.4 Cost-benefit analysis**

- Identification, valuation and comparison of the costs (disadvantages) and benefits (advantages) of the project, from a whole-of-society perspective (i.e. including the perspectives of the proponent, government and stakeholders)

## **Section 7 – Description of the Baseline Environment**

Provide a detailed description of baseline (i.e. current or existing) environmental conditions relevant to the project and its area of influence, to develop awareness and understanding of important environmental features, patterns and trends; to support identification of potential impacts of the project on the environment and potential impacts of the environment on the project (section 8); and to assist with the formulation of impact mitigation measures (section 10). The level of examination and effort that is required to adequately describe different aspects of the environment will depend on the type of project, its scale of operation, its physical setting and its area of influence.

In detailing the baseline environment it is important to state what is known or unknown, what assumptions have been made, what methods have been used for data collection and how reliable the data/information is. Studies or surveys undertaken by the proponent, their consultant, or third party researchers, should be adequately detailed and referenced (section 14).

Where relevant, the following aspects of the environment should be described:

- Climate (e.g. including temperature, rainfall/evaporation, flooding, drought, winds, extreme weather events, climate change projections and climate change elements likely to affect the project)
- Topography, geology and soils (e.g. significant landscape features and characteristics; landscape gradient or slope; land capability and availability; seismic

characteristics and earthquake and volcanic potential; areas vulnerable to landslides, rock fall, erosion)

- **Land tenure, zoning and use** (e.g. community food gardens, agriculture, national parks, sensitive habitat, community or public reserves, village settlements, cemeteries, manufacturing industry)
- **Water** (e.g. surface and groundwater quantity and quality; site hydrology; local catchment area; upstream and downstream water uses/users; areas vulnerable to flooding, inundation or storm surges)
- **Marine** (e.g. coastal hydrology, tides, waves, currents, storm surge, salinity, sea water temperature, suspended load, seabed bathymetry)
- **Air** (e.g. existing sources of air emissions; ambient air quality parameters such as nitrogen dioxide, sulphur dioxide, carbon monoxide, lead, PM10 particles; location of nearest sensitive receptors)
- **Noise** (e.g. baseline noise levels and noise pollution; location of nearest sensitive receptors)
- **Flora** (e.g. plant species and communities within the project and surrounding area; native, endemic, threatened, invasive or culturally-significant species; areas subject to previous habitat clearing or disturbance; species, plant communities or habitat vulnerable to environmental hazards and environmental change)
- **Animal life** (e.g. animal species and communities within the project and surrounding area; native, endemic, threatened, migratory, invasive or culturally-significant species; habitat within and adjacent to the project area suitable for species of conservation significance; species, animal communities or habitat vulnerable to environmental hazards and environmental change)
- **Human communities** (e.g. towns/villages/settlements; population and local demographics; access to education, literacy level and educational attainment; housing; energy and water resource access and use; land use, gardens and subsistence dependency; natural resource use; transport and other infrastructure; cultural traditions; community structure and governance systems; marginalised groups; community health status; social infrastructure and services e.g. health care, education, recreation; landscape and visual amenity; vulnerability to environmental hazards and environmental change)
- **Local and national economy** (e.g. skills, livelihoods and formal/informal employment; economic and business conditions; distribution of income; major sectors and industries)
- **Social/cultural resources and heritage** (e.g. objects or sites of social/cultural significance, cultural and archaeological assets)

## Section 8 – Impact Assessment

Assess and describe potential impacts of the project on the environment. The impact assessment should detail negative and positive; immediate, short-term and long-term; unavoidable, irreversible and reversible impacts. In conducting the impact assessment give consideration to:

- all relevant aspects of the environment (section 7, description of the baseline environment) and how they are likely to be changed or affected by the project, either directly or indirectly. This should include assessment of how the project may exacerbate environmental hazards and environmental change processes



- the impacts and benefits of the host community and other affected people at each phase of the project
- the nature of changes or affects, including negative consequences and/or expected benefits
- over what area, or on what scale, changes or affects are likely to take place
- changes or affects that will arise at different stages of the project (e.g. during construction, operation, production, decommissioning, closure)

Assess and describe potential impacts of the environment on the project. The impact assessment should detail negative and positive; immediate, short-term and long-term; unavoidable, irreversible and reversible impacts. In conducting the impact assessment give consideration to:

- all relevant environmental hazards, and how they are likely to change or affect the project, either directly or indirectly (e.g. weather-related hazards such as heavy rain, cyclones; water-related hazards such as flooding, tidal waves; geological hazards such as landslides, ground failure, earthquakes, tsunami)
- environmental change processes, and how they are likely to change or affect the project, either directly or indirectly (e.g. climate change and associated processes such as sea level rise, increased cyclone intensity; loss of land from coastal erosion and shoreline change)
- the nature of changes or affects, including negative consequences and/or expected benefits
- over what area, or on what scale, changes or affects are likely to take place

Explain the methods used for impact assessment, such as modelling studies, site or field-based surveys, or review of existing similar situations or previous studies.

In detailing impacts it is important to acknowledge what is known or unknown, what assumptions have been made, how reliable the data and analyses are, and whether any information deficiencies or uncertainties have influenced the conclusions reached.

## **Section 9 – Cumulative Impacts**

Examine the project in the context of previous, existing and known future developments. This will help to ensure that the project's potential impacts are not considered in isolation and that cumulative impacts have been adequately considered in the development of the EIA report and EMP.

Cumulative impact assessment can include an evaluation of changes in:

- Land and seascape processes and functions (e.g. landscape hydrology, coastal stability)
- Natural resource quality and availability (e.g. water, energy, critical habitat for important flora and fauna)
- Social and community dynamics (e.g. population growth, traffic volumes, in-migration)
- Economic conditions (e.g. industry development, job opportunities, cost of living)

For identified cumulative impacts, assess if they will be permanent. If they are not likely to be permanent, specify what steps will be taken to minimise long-term negative effects.

## **Section 10 – Environmental Management**

Provide a draft environmental and social management plan (ESMP), including a detailed discussion of the mitigation measures that can be feasibly undertaken, and explain how these mitigation measures will address the identified negative and positive impacts.

Also identify any best practices or industry standards the proponent intends to commit to, as well as any optimisation measures to be taken to strengthen or enhance positive impacts.

The draft ESMP should cover all phases of the project, from construction through to operation, decommissioning, closure and post-closure (where relevant). It should be further developed and refined following the conclusion of the ESIA process. Provision should also be made for periodic review of the ESMP once the project becomes operational.

Recommended topics to be included in the ESMP document:

- Environmental performance objectives for the project
- The proponent's environmental and social management framework, i.e. who will have responsibility for overseeing the ESMP, the implementation of different mitigation measures, incident response, environmental monitoring and reporting
- Specialised management plans with a high level of operational detail for sensitive or high-risk aspects of the project (e.g. a waste management plan, a water management plan, an erosion and sediment control plan, a disaster management plan, social impact management plan – which may include a benefit sharing agreement, resettlement plan, in-migration management plan, climate change adaptation plan)
- Evidence that mitigation measures and specialised management plans are likely to be effective when implemented
- A detailed monitoring plan, including performance criteria for measuring the extent of environmental impacts, and/or the success of mitigation measures; and for ensuring early detection of impacts. The monitoring plan should also include a schedule for reporting on project activity outcomes and monitoring results to regulatory authorities; and it should list the regulatory authorities that will be reported to
- Environmental management expectations and stakeholder consultation requirements to be placed on project contractors
- Provisions for independent auditing (especially in the case of high-risk projects)
- Staffing and equipment requirements, allocated implementation budget, and any training programmes or capacity development necessary to ensure successful ESMP implementation
- A process for responding to accidents, unanticipated or emergency incidents
- A process for managing and responding to stakeholder concerns or complaints

It is advisable to cross-reference different elements of the ESMP to relevant text in the ESIA report.

## **Section 11 – Local community, land/resource owner and wider stakeholder engagement and consultation**

Include details of engagement and consultation activities such as:

11.1 Dates, types and methods of engagement and consultation, and outcomes to date

11.2 Stakeholder mapping and identification of key stakeholders

11.3 Key findings from engagement and consultation, including a summary of issues and concerns raised by various stakeholder groups (directly affected persons; businesses;

NGOs; civil society, women's, leaders and church groups) and how these will be addressed or have been incorporated into project design and mitigation measures

11.4 Future engagement and consultation activities planned to ensure stakeholders remain informed about the project

11.5 Information on negotiation and agreements with directly affected persons and land/resource owners

## **Section 12 – Conclusions and Recommendations**

Present the main conclusions of the ESIA report and the proponent's suggested recommendations for progressing their project, including key environmental management and mitigation measures that should be undertaken.

## **Section 13 – Disclosure of Consultants**

State the names, qualifications and contact details of all consultants responsible for preparing the EIA report, and the services or work they completed.

## **Section 14 – References**

Appropriately reference all information sources that have been used or consulted during ESIA report preparation (e.g. using the Harvard referencing system). Information sources may include studies or surveys undertaken by the proponent, their consultant, or third party researchers.

## **Section 15 – Appendices**

Include appendices that support the main text and that do not contain unnecessary information. Appendices may present:

- Relevant environmental studies and reports
- Detailed technical information
- Draft management plans
- A table listing how the ToR have been addressed, cross-referenced to relevant sections of the EIA report
- A table listing environmental mitigation/management commitments made by the proponent
- Evidence of project support from stakeholders

## **ANNEX 3 – CONTENTS OF AN ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN**

This Annex is derived substantially from the *Environmental Management Plan Guidelines, Commonwealth of Australia 2014*. This template can be used for guidance in preparing the ESMP component of the ESIA and also the Contractor's ESMP for the construction phase.

### **Key Principles**

An environmental and social management plan should:

- be balanced, objective and concise
- state any limitations that apply, or should apply, to the use of the information in the environmental management plan
- identify any matter in relation to which there is a significant lack of relevant information or a significant degree of uncertainty
- include adaptive management strategies for managing uncertainty
- be written in a way that is easily understood by other parties
- clearly present how conclusions about risks have been reached
- ensure that the person taking the action takes full responsibility for the content and commitments contained in the plan.

### **Commitments**

- All commitments must be specific and auditable with measurable outcomes and clear timeframes.
- To ensure readability, write clearly and avoid long sentences with complex clauses.
- Always use the terms 'will' and 'must', rather than 'should' or 'may' when committing to carry out management actions.
- Avoid use of ambiguous terminology such as 'where possible', 'as required', 'to the greatest extent possible'. If it is necessary to include ambiguous terminology, it should be explained and examples given.
- Clearly explain any technical terms or acronyms used, and/or define them in a glossary.
- Commitments or statements within the management plan must be consistent with other relevant management plans or conditions of approval.

## **CONTENT OF AN ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN**

### **1. Cover Page**

- World Bank project number and project name
- Implementing agency/proponent
- Date of preparation of the environmental and social management plan

### **2. Declaration and Document Version Control**

- person accepting responsibility for the environmental and social management plan – signed declaration
- The document version control should be a simple system that ensures that details of all key changes to the document over time are properly recorded.

### **3. Table of Contents**

#### **4. Executive Summary**

- The executive summary should note the key elements of the project, the purpose of the document, the main potential impacts and the primary strategies planned to address these impacts.

#### **5. Conditions of Approval Reference Table**

When an environmental and social management plan is prepared after the project has been approved under the relevant country systems, the management plan should include a table detailing the following information:

- The approval condition requirements the plan is intended to address
- The section and page numbers which address the approval conditions.
- A summary of the key commitments relating to each of the approval conditions.

#### **6. Project Description**

The ESMP should provide a description of the project as this provides context for the plan. The location of all project actions should be described with a clear definition of the project's area of influence, with a map showing the various locations provided. Basic information on the environment at these locations should also be included as this helps provide the environmental context to which the ESMP applies.

The plan should distinguish between construction and operational activities, if relevant. A schedule of intended commencement and completion dates should be provided. Projects undertaken in stages should identify each stage in the schedule.

#### **7. Objectives**

The environmental and social outcomes of the plan should be defined. These should be tailored to the environmental and social issues outlined in the plan.

#### **8. Environmental and Social Impact Management Roles and Responsibilities**

The plan should define the roles and responsibilities of personnel in charge of the environmental and social impact management of the project. The roles and responsibilities of each relevant position should be documented, including the responsibilities of subcontractors. The names of the responsible personnel do not need to be included. Identification of the position titles, roles and responsibilities is sufficient. If the roles and responsibilities are expected to change over time the long term variations should also be documented.

#### **9. Reporting**

The description of reporting requirements should include:

- a list of required reports including where appropriate monitoring, environmental incidents, non-compliance, corrective action and auditing
- a description of the standard report content
- the schedule or triggers for preparing a report
- who the report is provided to
- document control procedures

#### **10. Environmental Training**

All people involved with the project should receive relevant environmental training to ensure they understand their responsibilities when implementing the ESMP. People to be trained include those at the site/s of all project activities and operations, including contractors,

subcontractors and visitors. The training should be tailored to the role of the individual in the project.

The environmental and social management plan should describe the training to be implemented and could include:

- site inductions
- identification of key points of environmental value and any relevant matters of national environmental significance
- understanding the requirements of the environmental management plan and the individual's role
- environmental incident emergency response procedures
- site environmental controls
- an outline of the potential consequences of not meeting their environmental responsibilities.

Records of all training conducted should be maintained and include:

- the person receiving the training
- the date the training was received
- the name of the person conducting the training
- a summary of the training.

## **11. Emergency Contacts and Procedures**

The ESMP should identify the key emergency contacts responsible for managing environmental emergencies associated with the project and their contact details. These personnel should have the power to stop and direct works so that they can manage emergencies effectively. In addition, the plan should establish procedures for managing environmental emergencies and ensure that those procedures are implemented and maintained.

## **12. Potential Environmental and Social Impacts and Risks**

The potential impacts section of the plan should focus on identifying, locating and quantifying the potential impacts (direct and indirect) of the project on the physical and human environment. It should discuss:

- the relevant impacts of the project
- the nature and extent of the potential short-term and long-term effects
- any uncertainties regarding the predicted impacts.

This may include a summary of any relevant information previously provided in assessment documentation, such as an environmental impact statement or preliminary documentation.

Impacts from relevant stages of the action (for example, pre-construction, construction and operation) should be delineated in this section and should reflect the relevant conditions of approval.

## **13. Risk Assessment**

Once the potential impacts of the proposal are clearly identified a risk assessment should be undertaken for each potential impact. This means that the likelihood and consequences of each potential impact need to be estimated.

The function of the risk assessment is not to repeat or supersede the original assessment of a project or its conditions of approval. Rather it is to ensure that these risks are effectively

translated into actual mitigation and management actions. Impacts with higher risk ratings usually require more management actions and controls. This minimises the likelihood of the risk occurring and reduces the consequences to acceptable levels.

#### **14. Environmental Management Measures**

The environmental management plan should clearly state how the potential impacts of the proposal will be managed and this information usually forms the bulk of the content of the plan. For each potential impact the plan should address:

- environmental management activities, controls and performance targets
- environmental management maps and diagrams
- monitoring programs with trigger values for corrective actions
- corrective actions and non-compliance reporting
- environmental schedules.

##### ***Environmental management activities, controls and performance targets***

The environmental management plan should describe all the environmental management activities and control measures that will be implemented to avoid or minimise environmental impacts. The description of each measure should also specify the timeframes for implementation and the performance targets or outcomes to be achieved.

##### ***Environmental management maps and diagrams***

Environmental management maps and diagrams are useful visual tools that aid in environmental management activities. Maps can provide useful spatial information about areas that require environmental management. Diagrams can illustrate the design of environmental control measures and the flow of environmental management procedures.

For example, a map could be used to show:

- environmentally sensitive areas on or near a project site
- vegetation that requires protection
- buffer zones or 'no-go zones'
- monitoring locations.

##### ***Environmental monitoring***

The environmental management plan should specify how the effectiveness of environmental management measures will be monitored. It should include the methodology, frequency and duration of monitoring activities. It should also include trigger values or conditions under which corrective actions are taken. The plan should also specify if, and when, follow up action is required and how monitoring records will be maintained.

##### ***Corrective actions***

The environmental management plan should include procedures for addressing:

- monitoring results which exceed the trigger values for corrective action
- potential corrective actions
- reporting non-compliance with approval conditions to the relevant authority
- environmental incidents and emergencies.

The plan should also identify who is responsible for implementing the above procedures. Auditable systems should be developed for recording the implementation of these procedures and their outcomes.

## **15. Social Impact Management**

This section should describe the management measures for any identified social impacts arising from the project (eg. land access).

## **16. Audit and review**

### ***Environmental and Social auditing***

The environmental and social management plan should include the schedule or triggers for auditing the implementation and effectiveness of the plan. It should address both internal and external audit requirements including who is responsible for undertaking the audits and reporting the results.

### ***Environmental and social management plan review***

The environmental and social management plan should specify the schedule or triggers for reviews of the plan.

A review should assess whether the plan is achieving its objectives and the requirements of any relevant approval conditions. A review should take into account environmental monitoring records, corrective actions and the results of any audits. The plan should also identify who will be responsible for undertaking the review. During the review process, any reasons for varying the environmental management plan should be documented.

Review of an environmental and social management plan would typically be undertaken:

- following significant environmental or social incidents
- when there is a need to improve performance in an area of environmental impact
- periodically for actions undertaken over long timeframes such as one, two or five years.

## **17. Implementation Arrangements**

This section should describe roles and responsibilities for ESMP implementation, associated budgets and capacity building where required.

## **18. Glossary**

This should include any acronyms, all terms which are open to different interpretations or terms which are not in common use. Terms which are defined in the approval conditions should retain the same meaning as that used in the conditions.



## **ANNEX 4 - RESETTLEMENT POLICY FRAMEWORK**