

# PROJECT INFORMATION DOCUMENT (PID) CONCEPT STAGE

Report No.: PIDC12261

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| <b>Project Name</b>                           | ELECTRICITY ACCESS EXPANSION PROJECT (P151618)   |
| <b>Region</b>                                 | EAST ASIA AND PACIFIC  |
| <b>Country</b>                                | Solomon Islands  |
| <b>Sector(s)</b>                              | Transmission and Distribution of Electricity (50%), Other Renewable Energy (50%)               |
| <b>Theme(s)</b>                               | Rural services and infrastructure (40%), Other urban development (40%), Social Inclusion (20%) |
| <b>Lending Instrument</b>                     | Investment Project Financing   |
| <b>Project ID</b>                             | P151618  |
| <b>Borrower(s)</b>                            | Solomon Islands  |
| <b>Implementing Agency</b>                    | Solomon Islands Electricity Authority, Ministry of Mines, Energy & Rural Electrification       |
| <b>Environmental Category</b>                 | B-Partial Assessment   |
| <b>Date PID Prepared/ Updated</b>             | 01-Sep-2015  |
| <b>Date PID Approved/ Disclosed</b>           | 15-Sep-2015  |
| <b>Estimated Date of Appraisal Completion</b> | 17-Mar-2016  |
| <b>Estimated Date of Board Approval</b>       | 30-Apr-2016  |
| <b>Concept Review Decision</b>                | Track II - The review did authorize the preparation to continue                                |

## I. Introduction and Context

### Country Context

1. As a relatively remote, widely dispersed, and linguistically disparate country, Solomon Islands faces considerable development and state building challenges. An archipelago of 997 islands, Solomon Islands has a total land area of 29,900 km<sup>2</sup>. The population of 550,000 is dispersed across 90 inhabited islands and has among the lowest population densities (18 persons/km<sup>2</sup>) and urbanization rates (17%) in the world. Solomon Islands has the second lowest average income in the region; income distribution is inequitable, particularly geographically, with rural expenditure levels significantly below urban expenditure levels. Similarly, social indicators in Solomon Islands, although improving, are among the worst in the region, falling short of the targets set for the Millennium Development Goals (MDGs).

2. Solomon Islands has made significant progress in restoring stability following conflict from 1998 to 2003. The conflict, known locally as the "tension", emerged as a result of grievances between the local Guadalcanal landowners and migrants, predominantly from the most populous island of Malaita, drawn by economic opportunities available in Honiara, the capital city of the Solomon Islands. Macroeconomic and fiscal stability has been restored since a fiscal crisis in 2009 precipitated by the global economic slowdown, development gains have been achieved in many areas, key government functions have been reestablished, and Solomon Islanders are increasingly taking leadership of government programs.

3. The economy consists of a mixed subsistence sector on which the majority of the population is dependent, and a small monetized sector dominated by large-scale commercial enterprises. Between 1996 and 2002, the GDP declined in real terms by 24%, over 35% per capita. Performance was considerably worse for the monetized sector than the subsistence sector. From 2003 the GDP grew by 3.8%, returning to earlier levels and signaling the return of economic growth. Recent flooding has imposed major social and economic costs. During early April 2014, floods in and around Honiara led to at least 23 deaths, impacting 52,000 people, and leaving more than 10,000 people in evacuation shelters. Flooding caused widespread destruction of businesses, houses, and public infrastructure. Private sector and public service activities were heavily affected. Total damage and losses from the flooding are estimated at US\$108 million or 9.2 percent of GDP, with projected growth for 2014 revised down to 0.1 percent from pre-flood baseline projections of around 4 percent.

4. Despite this progress, the Solomon Islands remains a fragile country. Youth unemployment, thin institutional and human capacity, enclave developments, perceived spatial inequalities (urban vs. rural; Guadalcanal vs. other islands), a fluid political environment, and rapid social change all present challenges to the resilience of Solomon Islands' newly reestablished governance institutions. In addition, the Solomon Islands - as with many of the small and remote Pacific island countries - presents significant challenges of diversity, geographic dispersion with a largely rural population, and vulnerability to natural hazards, i.e. tropical cyclones and earthquakes. Delivering the services necessary to meet the MDGs in such a situation is both challenging and costly.

#### **Sectoral and Institutional Context**

5. The Solomon Islands is almost entirely dependent on imported refined petroleum fuels for national energy needs for electricity generation, for transport and for lighting. The installed grid generation capacity is 28 MW and is currently 100% diesel generation. Total energy production in 2013 was 81.1 GWh, of which 73.0 GWh (90.0%) was for the Honiara grid and 8.1 GWh (10.0%) for grids serving provincial centres on other islands. Grid based generation capacity on provincial centre power grids outside Honiara is approximately 6.9 MW. In 2013 the maximum demand on the Honiara grid was 13.62 MW. The state-owned power utility, the Solomon Islands Electricity Authority (SIEA) is responsible for electric power generation, transmission and distribution to all urban and provincial centres; i.e. Honiara, nine provincial centres, and Noro Township in the Western Province. SIEA provides power to urban centres through diesel generators, except for Buala town on Isabel Province and Malu'u substation in Malaita which include supply by currently non-operational mini-hydro. In addition to its own generation, the SIEA purchases a small share of its total energy from privately owned generators under contract.

6. Generation capacity expansion on SIEA grids. The SIEA plans to significantly increase the generation capacity across its various power grids in the period 2014 to 2018, to enable increased

reliability of supply, improved efficiency and the ability to meet projected load growth and new connections.

a. On the Honiara grid, the SIEA commissioned 3MW of new generation in February 2014, and is tendering for the construction of new powerhouse with 10MW of diesel generation capacity, which is expected to be commissioned by early 2016. In addition, transformational development of renewable energy resources is also well underway, with two major projects: i) 15MW Tina River Hydropower Scheme (run of river), with tenders to be called by mid- 2014; ii) geothermal resource on Savo Island, which is 35km off-shore from Honiara. The SIEA is also investing to strengthen the capacity of the Honiara grid, and on March 21, 2014 the World Bank Board approved US\$13 million in additional financing to support that endeavor.

b. Provincial grids. The SIEA's current plans for all its provincial grids away from Honiara involve: a) construction of several new small powerhouses to replace existing ones; b) installation of new, larger and more efficient diesel generation units; c) strengthening the distribution grids to increase reliability and quality of service and meet load growth. The SIEA also plans to rehabilitate the 150kW Buala mini-hydro scheme in 2014, so that it once more supplies nearly 100% of the power to the town of Buala, with diesel generation used as a back-up. The SIEA is currently negotiating a loan with the Asian Development Bank (ADB) to develop the 750kW Fiu River Hydro Scheme on the island of Malaita. Fiu River Hydro would feed into the Auki grid, and enable increased connections on Malaita, the most populated of the Solomon Islands. These developments of generation capacity in the provinces mean that the SIEA is able to re-examine plans for grid extensions. All of the proposed grid extensions have been analyzed and it was proven that sufficient generation capacity already exists to accommodate the new loads.

7. In addition to the national grid, some success has been recorded by local communities and Rural Energy Service Companies (RESCOs) in developing mini-grids/micro-grids, most of which are based on micro-hydro technology, but some use coconut oil biofuel and solar PV in areas of low housing density where the grid extension is not economically viable.

8. The limited coverage of the existing power network, dispersed population across an island archipelago and heavy reliance on imported petroleum fuels for power generation has led to a high cost of electricity (US\$0.85/kWh for households and US\$0.91/kWh for commercial customers) and low access rate. According to the 2009 Census of Solomon Islands, 79% of households are without access to any electrical supply. Grid-based electricity supplies approximately 12% of the national population confined to Honiara, the capital city and largest electrical load center, and nine provincial centers. The ten grids are operated by SIEA, and the reach of these grids has not expanded dramatically since 1978, when Solomon Islands became independent.

9. In Honiara, 67%, of households (about 10,000 households), have access to electricity, with 96% of these households having access via the SIEA's distribution grids. But in the provinces taken as a whole, access to any electricity supply is only 16%. At a provincial level, the electricity access rate for grid power is highest in Western Province 12.1(%), but access rates in the remaining provinces are extremely low; for example, Malaita (3%), Temotu (3%), Choiseul (2%).

10. There is a distinct urban-rural divide regarding access to electricity. In the rural areas of the provinces, more than 95% of rural households are without any electricity service (56,000 household). The 5% of rural households (about 3,752 households) that do have access to electricity

obtain it through a small number of off-grid and individual household solar and diesel systems. This low access to energy exists despite an abundance of significant potential for renewable energy resource (solar, hydro, biofuel and recently geothermal). RESCOs and NGOs are key players in the rural electrification.

11. Geographic, commercial, regulatory, political and institutional factors have all contributed to low access rates, including: (i) difficult geography and dispersed small size of population centres; (ii) lack of Government funding for grid extensions; (iii) high cost of diesel power generation in the provincial centres which provides a disincentive to the corporatized SIEA to expand the distribution network (where cost of generation exceeds national tariff); and (iv) limited affordability to pay for connection costs at consumer level.

### **Relationship to CAS**

12. The Solomon Islands National Development Strategy 2011-2020, prepared by the Ministry of Development Planning and Aid Coordination prioritizes increasing electricity access. It is widely acknowledged that access to electricity contributes to economic and social development, and has particular benefits for improved education and health for women and children. The project complements the IDA funded Solomon Islands Sustainable Energy Project (SISEP, P100311), which aims to improve the operational efficiency, system reliability and financial sustainability of SIEA. Increases in transmission capacity within the grid, improved efficiency of power supply, and tariff reforms are expected to lay the ground for increasing access to grid-based energy. The proposed project will support access to energy for the poor by addressing the affordability of poor households to pay the up-front connection charges and costs of basic wiring. The proposed project is in line with the World Bank's Country Assistance Strategy 2013-2017 that defines improving infrastructure and lowering costs as one of the medium-term country goals.

## **II. Proposed Development Objective(s)**

### **Proposed Development Objective(s) (From PCN)**

13. The project development objective is to increase access of low-income households to electricity services in peri-urban and rural areas of Solomon Islands.

### **Key Results (From PCN)**

14. Three key PDO-level results indicators are proposed:

- People provided with access to electricity under the project by household connections – Grid (number) – Core Sector Indicator: 5,100 households.
- People provided with access to electricity under the project by household connections- Other Renewable Energy – Off-grid (number) – Core Sector Indicator: 18,000 households.
- Direct project beneficiaries (number), of which female (percentage) – Core Sector Indicator: 152,000 persons, of which the share of females will be tracked (1.04 male(s)/female).

## **III. Preliminary Description**

### **Concept Description**

15. The proposed project will be supported by grants from the Global Partnership on Output-Based Aid (GPOBA) and Scaling Up of Renewable Energy Program in Low Income Countries (SREP) under the Strategic Climate Fund. Both sources of financing will be used for an Output Based Aid (OBA) subsidy that will buy down the investment cost for grid and micro-grid pre-paid metered connections and basic wiring. These grant funds will be complemented by Government

funds in the order of \$2 million to finance rural mini-grids, US\$3 million in SIEA funds to finance grid extensions and densification, and US\$3 million from private commercial sources to finance rural mini-grids.

16. The proposed project design will have the following components:

17. Component 1 – Implementation of low cost electricity access expansion (US\$9.9 million), which has two sub-components:

a) Micro-grid densification/extension to increase access to low cost electricity (US\$ 6.9 million: GPOBA US\$1.5 million and US\$5.4 million SREP). Where grid extension is not economically justifiable due to high investment cost for low expected load, the OBA subsidy provides incentives to SIEA and local electricity service providers (RESCOs, NGOs, etc.) to reach poor households in remote areas through micro-grid densification. The subsidy will cover pre-paid meter micro-grid connections. The expected target under this component is 17,784 low income households (117,368 beneficiaries).

b) Grid extensions/densification to expand access to low cost electricity services (US\$ 3 million: GPOBA). The OBA subsidy provides incentives to SIEA or RESCOs to increase electricity access of 5,164 low income households (34,080 beneficiaries) located in peri-urban and rural areas. The OBA subsidy will cover new pre-paid meter connections.

18. The grid extensions are proposed in the context of improved technical and operational capacity of SIEA as reflected by power system reliability and efficiency. The improved financial performance of the SIEA is enabling it to both plan and seek financing for capital investments across the country, including in its largest market and cost center, the Honiara grid. Thus, after decades of underinvestment due to its hitherto poor financial position, a significant program of capital investment in generation, transmission and distribution infrastructure is planned for 2013-16 to improve generation, transmission and distribution quality, network efficiency and reach of services. In this sector context, the GPOBA grant aims at increasing access by enabling the national utility to provide electricity service to poor households in its project area.

19. For remote areas, where the extension of the grid is not economically justifiable, a number of local service providers (RESCOs, NGOs etc.) will be selected by Ministry of Mines, Energy and Rural Electrification (MMERE) to participate in the GPOBA program, based on clearly defined criteria. Part of the GPOBA and SREP grants under sub-component 1(a) will be allocated to the local service providers.

20. Component 2 - Implementation support for SIEA (US\$ 200,000: GPOBA). This component covers the operating expenses expected to be incurred by SIEA for the management of the project. It includes consultancy and logistics cost to ensure supervision of the project, compliance with environmental and social safeguards, training of RESCOs, NGOs, local communities on technical connection standards, Bank's safeguards and fiduciary procedures as needed, communities' outreach on GPOBA grant requirements.

21. Component 3– Technical Assistance to enhance Renewable Energy Enabling Environment (US\$1 million: SREP). Strengthening both the SIEA's capacity in power system planning, and its ability to deliver capital projects across the Solomon Islands, would underpin efforts to scale up

renewable energy and in meeting its statutory obligations under the Electricity Act to: (i) “promote and encourage the generation of electricity with a view to the economic development of Solomon Islands”; (ii) “to secure the cost of electricity at reasonable prices”; and (iii) “to establish, manage and operate electric power systems”. There is also a need to strengthen the capacity of MMERE to further develop the policies and regulations that govern the energy sector. The existing policy and regulatory environment limits development of renewable energy by inhibiting investment, including private investment in renewable generation. The expected outcome of Component 3 will consist of establishing an improved enabling environment for scaling-up renewable energy. The outputs of Component 3 will include (i) development of improved processes for land acquisition for distribution extensions and mini-grids, (ii) revised Electricity Act and Petroleum/Biofuels laws and regulations, (iii) capacity development within SIEA, and (iv) capacity development within MMERE.

#### Implementation arrangements

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22. The project will be managed by Ministry of Mines, Energy & Rural Electrification (MMERE) and the national power utility company, Solomon Islands Electricity Authority (SIEA). It will be implemented by SIEA for grid densification and Rural Energy Service Companies (RESCOs) and local communities for micro-grid densification/extension. The project will use self-selection targeting in peri-urban areas and geographic targeting in rural areas, whereby all rural beneficiaries will be eligible for subsidies under the project.

23. The Solomon Islands Government is committed to scaling-up renewable energy in the Solomon Islands. MMERE will have overall responsibility for the project, while both MMERE and SIEA will act as implementing agencies for relevant components. A Project Steering Committee will be established to oversee project implementation. The Project Steering Committee would comprise:

- Ministry Mines, Energy and Rural Electrification (MMERE).
- Ministry of Finance and Treasury (MoFT).
- Ministry of Rural Development (MRD).
- Ministry of Development and Aid Coordination (MDAC).
- Ministry of Infrastructure and Development (MID).
- Solomon Islands Electricity Authority (SIEA).
- Private sector representative.

The role of the Project Steering Committee is to facilitate timely project execution through better coordination of agencies involved in rural infrastructure delivery and permitting.

24. The organizational arrangements for the project will be as follows: A) Overall Responsible Agency: Ministry of Mines, Energy and Rural Electrification (MMERE); B) Focal Point Persons: (i) Director, Energy Division, MMERE; and (ii) General Manager, SIEA.

25. MMERE will be implementing agency for Component 1(a): Renewable Energy Mini-grids, and Component 3: Capacity Building. MMERE has significant experience with implementation of development partner funded projects. The project will provide design technical support and capacity building to MMERE to ensure the components are designed and implemented efficiently and sustainable systems are established for the operation and maintenance period. As mentioned above,

under component 1(a), MMERE will select the local service providers. The selection criteria developed by MMERE and the application process will be presented in the Project Operations Manual (POM) and will include the pre-financing capacity, technical and operational capacity of local service providers. There is some success in Solomon Islands over the last 20 years with local communities and RESCOs in developing micro-grids, most of which are based on micro-hydro technology, but with some using coconut oil biofuel and solar PV. The development of an estimated 60 mini-grids in rural villages utilizing hydropower, biofuel (coconut oil based) and solar photovoltaic power is planned under the project, under which and OBA model will be used to subsidize household connections made by RESCOs and SIEA (i.e., pre-paid meter connections mentioned above).

26. SIEA will be implementing agency for Component 1(b): Grid Extensions; and Component 3. A recently completed procurement capacity assessment of SIEA has indicated that SIEA has an established procurement unit with considerable procurement experience; however, the experience is largely related to procurement of small equipment packages. SIEA also has limited experience in managing larger contract packages or ADB/World Bank procurement systems. A financial management assessment was also completed for SIEA where inefficiencies were noted in areas including internal control. A capacity assessment for SIEA will be undertaken during project preparation and will include management capacity assessment, procurement capacity assessment, and financial management assessment. Based on the analysis, risk mitigation will be designed into the project to address capacity concerns, and may include (i) capacity building training for SIEA staff, (ii) provision of international experts to assist with key functions related to project design and implementation, and (iii) procurement options such as long term maintenance contracts, operation and maintenance contracts, and engineer, procure and construct (EPC) procurement.

27. During project implementation and to ensure compliance with GPOBA requirements, an Independent Verification Agent (IVA) will be engaged by the World Bank to enhance the independence of the verification process. The IVA will independently verify the outputs under the project according to the technical standards specified in the Project Operating Manual. Based on the output verification reports submitted by IVA, the Bank will disburse the OBA subsidy to the national utility, SIEA and participating local service providers.

28. The Bank, as part of its Project Supervision and Monitoring and Evaluation framework, will also carry out an assessment of the socio-economic impacts that increased access to electricity (provided under the proposed grant) have on a poor, fragile, Pacific Island country characterized by social inequalities, high unemployment rates, and significant cash constraints in rural communities. Particular attention will be paid to the analysis of the impact of electricity on women. The assessment will incorporate electricity market analysis (including household energy consumption, access penetration rate).

#### IV. Safeguard Policies that might apply

| Safeguard Policies Triggered by the Project | Yes | No | TBD |
|---|-----|----|-----|
| Environmental Assessment OP/BP 4.01         | x   |    |     |
| Natural Habitats OP/BP 4.04                 |     |    | x   |
| Forests OP/BP 4.36                          |     | x  |     |
| Pest Management OP 4.09                     |     | x  |     |

|  |   |   |   |
|--|---|---|---|
| Physical Cultural Resources OP/BP 4.11         | x |   |   |
| Indigenous Peoples OP/BP 4.10                  | x |   |   |
| Involuntary Resettlement OP/BP 4.12            |   |   | x |
| Safety of Dams OP/BP 4.37                      |   | x |   |
| Projects on International Waterways OP/BP 7.50 |   | x |   |
| Projects in Disputed Areas OP/BP 7.60          |   | x |   |

## V. Financing (in USD Million)

|   |       |                       |      |
|---|-------|-----------------------|------|
| Total Project Cost:                               | 19.10 | Total Bank Financing: | 0.00 |
| Financing Gap:                                    | 0.00  |                       |      |
| <b>Financing Source</b>                           |       | <b>Amount</b>         |      |
| Borrower  |       | 5.00                  |      |
| Climate Investment Funds                          |       | 6.40                  |      |
| Global Partnership on Output-based Aid            |       | 4.70                  |      |
| Foreign Private Commercial Sources (unidentified) |       | 3.00                  |      |
| Total   |       | 19.10                 |      |

## VI. Contact point

### World Bank

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