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IMPLEMENTATION COMPLETION AND RESULTS REPORT

TF0A2923

ON A

SMALL GRANT

IN THE AMOUNT OF USD 2.25 MILLION

TO

SOLOMON ISLANDS

FOR

ELECTRICITY ACCESS EXPANSION PROJECT (P151618)

8 October 2020

Energy & Extractives Global Practice

East Asia And Pacific Region

CURRENCY EQUIVALENTS
(Exchange Rate Effective March 2018)

Currency Unit =		Solomon Islands Dollar (SDB)
SDB 7.668	=	US$1

FISCAL YEAR
January 1 – December 31

Regional Vice President:	Victoria Kwakwa
Country Director:	Michel Kerf
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ABBREVIATIONS AND ACRONYMS

ADB	Asian Development Bank
CPS	Country Partnership Strategy
ESMAP	Energy Sector Management Assistance Program
ESMF	Environmental and Social Management Framework
GDP	Gross Domestic Product
GIS	Geographic Information System
GPOBA	Global Partnership on Output-Based Aid
GPRBA	Global Partnership for Results-Based Approaches
ICR	Implementation Completion and Results Report
IFR	Interim Financial Report
ISR	Implementation Status and Results Report
IVA	Independent Verification Agent
LED	Light-Emitting Diode
LV	Low Voltage
M&E	Monitoring and Evaluation
NZMFAT	New Zealand Ministry of Foreign Affairs and Trade
MMERE	Ministry of Mines, Energy, and Rural Electrification
MoFT	Ministry of Finance and Treasury
MTF	Multi-Tier Framework
OBA	Output-Based Aid
OVR	Output Verification Report
PAD	Project Appraisal Document
PDO	Project Development Objective
PM	Program Manager
PMU	Project Management Unit
POM	Project Operations Manual
PRODUSE	Productive Use of Energy
RBF	Results-Based Financing
RPF	Resettlement Policy Framework
SDG	Sustainable Development Goal
SIDS	Small Island Developing States
SIEA	Solomon Islands Electricity Authority
SIEAEP	Solomon Islands Electricity Access Expansion Project
SIEAREEP	Solomon Islands Energy Access and Renewable Energy Expansion Project
SIG	Solomon Islands Government
SISEP	Solomon Islands Sustainable Energy Project
SP	Solomon Power
SREP	Scaling Up Renewable Energy in Low-Income Countries Program
STC	Short-Term Consultant
TF	Trust Fund

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DATA SHEET

BASIC INFORMATION

Product Information

Project ID	Project Name
P151618	ELECTRICITY ACCESS EXPANSION PROJECT
Country	**Financing Instrument**
Solomon Islands	Investment Project Financing
Original EA Category	**Revised EA Category**
Partial Assessment (B)	Partial Assessment (B)

Organizations

Borrower	Implementing Agency
Solomon Islands	Solomon Islands Electricity Authority, Ministry of Mines, Energy & Rural Electrification

Project Development Objective (PDO)

Original PDO

The project development objective is to increase access to electricity services in low-income areas of Solomon Islands.

FINANCING

	Original Amount (US$)	Revised Amount (US$)	Actual Disbursed (US$)
Donor Financing			
TF-A2923	2,225,000	2,193,565	2,193,565
Total	**2,225,000**	**2,193,565**	**2,193,565**
Total Project Cost	**2,225,000**	**2,193,565**	**2,193,565**

KEY DATES

Approval	Effectiveness	Original Closing	Actual Closing
20-Jul-2016	02-Nov-2016	30-Jun-2018	31-Mar-2020

RESTRUCTURING AND/OR ADDITIONAL FINANCING

Date(s)	Amount Disbursed (US$M)	Key Revisions
25-Mar-2018	0.30	Change in Results Framework Change in Components and Cost Change in Loan Closing Date(s) Change in Financial Management Change in Implementation Schedule Other Change(s)

KEY RATINGS

Outcome	Bank Performance	M&E Quality
Satisfactory	Satisfactory	Substantial

RATINGS OF PROJECT PERFORMANCE IN ISRs

No.	Date ISR Archived	DO Rating	IP Rating	Actual Disbursements (US$M)
01	04-Dec-2016	Satisfactory	Satisfactory	0.00
02	17-May-2017	Moderately Satisfactory	Moderately Satisfactory	0.01
03	07-Dec-2017	Moderately Satisfactory	Moderately Satisfactory	0.01
04	19-Jun-2018	Satisfactory	Satisfactory	0.30
05	31-Jan-2019	Satisfactory	Satisfactory	0.77
06	17-Mar-2020	Satisfactory	Satisfactory	1.72

ADM STAFF

Role	At Approval	At ICR
Regional Vice President:	Victoria Kwakwa	Victoria Kwakwa
Country Director:	Michel Kerf	Michel Kerf

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I. PROJECT CONTEXT AND DEVELOPMENT OBJECTIVES

Country Context

1. **The Solomon Islands is a relatively remote, widely dispersed, and linguistically diverse country, and it faces considerable development and state-building challenges.** An archipelago of 997 islands, the Solomon Islands has a total land area of 29,900 km^2. At the time of the project appraisal, the total population was 550,000 dispersed across 90 inhabited islands and the country had one of lowest population densities (18 persons per km^2) and urbanization rates (17 percent) in the world with roughly 80 percent of the population living in rural areas. It had the second-lowest average income in the Pacific region with inequitable income distribution, particularly geographically, with rural expenditure levels significantly below urban expenditure levels.

2. **Despite making significant progress, extreme poverty is relatively high in the Solomon Islands and the country's geography and remote location make the provision of services, including electricity, particularly challenging.** An estimated 25.1 percent of Solomon Islanders live below the global extreme poverty line, on less than US$1.90 per person per day (in 2011 purchasing power parity terms), higher than all other Pacific countries except Papua New Guinea. An estimated 56.7 percent of the population lives on less than US$3.10 per person per day (World Bank Poverty Data 2020).[1] The Solomon Islands is one of the few Pacific countries that did not achieve any of the eight Millennium Development Goals, in part reflecting the very high cost of providing essential services to such small pockets of people widely spread across a dispersed territory.

3. **Gender inequality is generally high in the Solomon Islands, as illustrated in the country's ranking at 156 on the gender inequality index**. Gender relations in the Solomon Islands are heavily male dominated, and this perpetuates discrimination against women and girls. Inequalities in control of decision-making, economic resources, access to health care, education, and leisure time restrict the rights and freedoms of girls and women, resulting in unequal benefits for them from the development process (ADB 2015).[2]

4. **The Solomon Islands is expected to be affected by COVID-19.** Travel restrictions and demand shocks, particularly to logging, are predicted to lead to considerable reductions in the gross domestic product (GDP) growth and tax revenue for the country. From the start of the pandemic in January 2020 till September 2020 (when the Implementation Completion and Results Report [ICR] was completed), the Solomon Islands remained one of the less than 20 countries with no confirmed COVID-19 case. All citizens not permanently living and working in Honiara have been requested to return to their home province and village; this is likely to put significant additional pressures on provincial divisions' health facilities, staff, and supplies. The World Bank-supported 'Solomon Islands Transition to Sustainable Growth Development Policy Operation' (US$15 million) will better enable the Government to meet the challenges of COVID-19's anticipated impact on economic growth and government revenue.

Sectoral and Institutional Context

5. **The Solomon Islands is almost entirely dependent on imported refined petroleum fuels for national energy needs for electricity generation, transport, and lighting.** The Ministry of Mines, Energy, and Rural Electrification (MMERE) is the supervising ministry, and its Energy Division bears responsibility for legal and regulatory development, institutional strengthening, and supervision of the vertically integrated, state-owned utility, the Solomon Islands Electricity Authority (SIEA), trading as Solomon Power (SP) since December 2015.

[1] https://databank.worldbank.org/data/download/poverty/33EF03BB-9722-4AE2-ABC7-AA2972D68AFE/Global_POVEQ_EAP.pdf
[2] https://www.adb.org/sites/default/files/institutional-document/176812/sol-country-gender-assessment.pdf

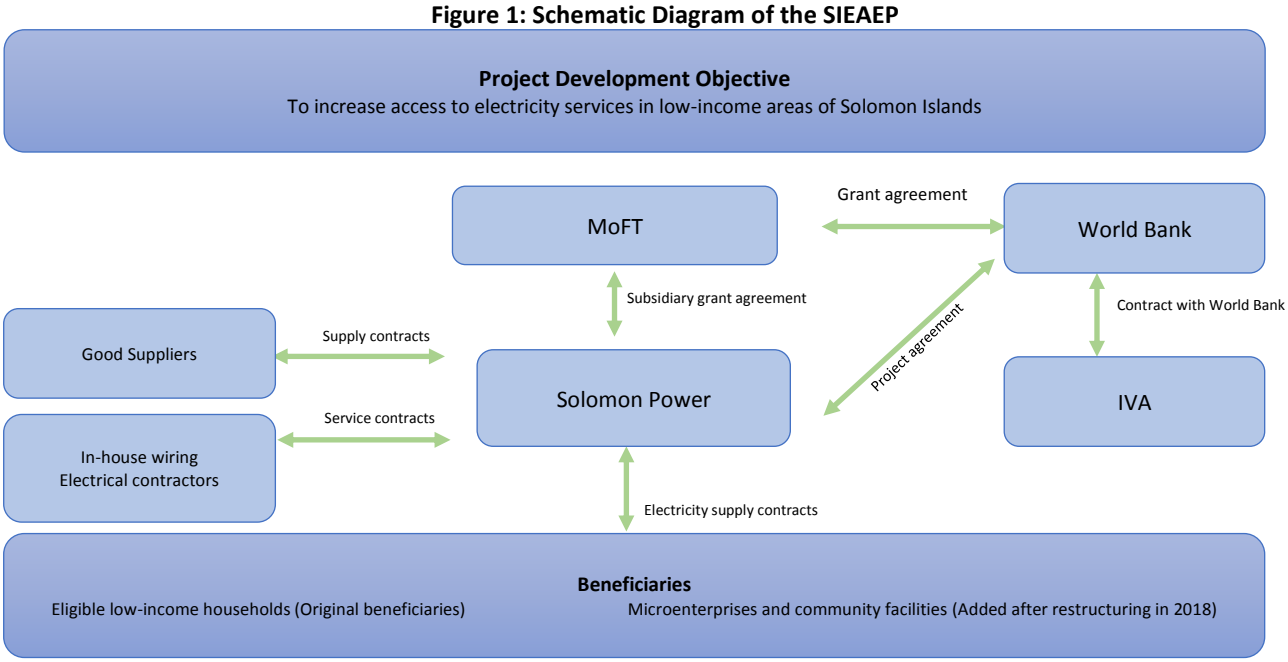
Operating under the Electricity Act, SP is the main supplier of electricity in the country and responsible for electric power generation, transmission, and distribution to all urban and provincial centers, including Honiara, nine provincial centers (so-called outstations), and Noro Township in the Western Province. Given the island geography of the country (with population dispersed on many small islands), apart from the Honiara power system, most other services are provided by what can be considered mini grids. Outside of SP's existing service areas, there are a small number of community operated grids, stand-alone diesel generators, or small solar systems for basic lighting and phone charging. Since an independent regulatory authority does not exist in the Solomon Islands, SP also advises the Solomon Islands Government (SIG) on regulatory instruments and is given the authority to issue licenses to entities who wish to generate and distribute electricity in areas not supplied by SP.

6. **The access to electricity has been improving over time and challenges posed by the limited coverage of the existing power network and dispersed population across an archipelago are dealt with proactively by SP.** According to the 2009 census of the Solomon Islands, 79 percent of households were without access to any electrical supply. Grid-based electricity supplied approximately 12 percent of the national population confined to Honiara, the capital city and largest electrical load center, and nine provincial centers. The 10 grids are operated by SP, and the reach of these grids has not expanded dramatically since 1978, when the Solomon Islands became independent. By the end of 2018, SP had registered a total of 18,781 customers as connected to its Honiara and outstations' network, compared to 17,190 in December 2017. Approximately 16,565 (88 percent) customers are on prepay who use the cash power meter and 2,216 (12 percent) are on post-pay who are on the normal kW meter (SP Annual Report 2018).[3] According to the World Bank, 66.7 percent households had electricity access in 2018.[4]

7. **The initial cost to connect to the grid in the Solomon Islands is high and a barrier to energy access, especially for low-income households.** The cost of connection is to be divided into (a) the cost of the service line and meter to be installed by SP and (b) the cost of in-house wiring which had to be installed by a licensed electrical contractor. SP covers the cost of the service line for customers whose house is within 20 m from the nearest distribution pole, but the customer has to pay SBD 800 (about US$100) for the meter and the actual cost of the service line (and auxiliary poles, if required) if the distance exceeds 20 m. The monthly income of the lowest quartile in urban areas is SBD 2,000 (about US$242) and only SBD 850 (about US$102) in rural areas, which makes the cost of service line and meter difficult to afford. Moreover, the high cost of the in-house wiring makes access to grid-supplied electricity difficult, particularly for low-income households. To overcome these challenges, the World Bank approved US$2.225 million Solomon Islands Electricity Access Expansion Project (SIEAEP) (P151618), supported by the Global Partnership on Output-Based Aid (GPOBA)[5] in 2016. The SIEAEP involved SP as an implementing agency; local licensed electrical contractors as in-house wiring service providers; a consultant as independent verification agent (IVA) (this particular component was managed by the World Bank); and low-income households, microenterprises, and community facilities as beneficiaries of the program (see figure 1).

[3] http://solomonpower.com.sb/sites/default/files/Reports/Solomon%20Power%20Annual%20Report%202018.pdf
[4] https://data.worldbank.org/indicator/EG.ELC.ACCS.ZS?locations=SB
[5] The Global Partnership on Output-Based Aid until February is now known as the Global Partnership for Results-Based Approaches (GPRBA) provides innovative financing solutions that link funding to achieved results. GPRBA's results-based financing (RBF) approaches provide access to basic services like water and sanitation, energy, health and education for low-income families and communities that might otherwise go unserved.

Figure 1: Schematic Diagram of the SIEAEP



Note: MoFT = Ministry of Finance and Treasury.

Rationale for World Bank Assistance

8. **The project was aligned with the World Bank Group's Solomon Island's Country Partnership Strategy (CPS) FY2013–2017** (Report No. 76349). The CPS was structured around two engagement areas: underpinning improvements in public service provision and strengthening economic resilience. The project supported the World Bank's engagement in both areas by extending access to electricity and improving economic resilience by easing constraints and improving infrastructure and lowering costs as one of the medium-term country goals. In particular, the project supported the CPS Outcome 5 on providing lower cost and reliable electricity from cleaner energy sources. The Systematic Country Diagnostic, 2017 (Report#115425-SB) recognizes the need to significantly expand access, especially grid level access including to enable productive purposes, and the dependence of access expansion on the price of electricity.

9. **The SIEAEP complemented the IDA-funded Solomon Islands Sustainable Energy Project (SISEP; P100311),** which was designed to improve the operational efficiency, system reliability, and financial sustainability of SP. The gains made under the SISEP, such as strengthened management and capacity of key staff, implementation of a successful commercialization strategy and enhanced financial sustainability, reduced system losses, and improved system reliability, laid the foundation for increasing access to the grid-based energy. The SIEAEP, which followed the SISEP, supported energy access for the low-income households by addressing the affordability as the upfront connection charges and the cost of basic wiring were high.

Alignment with National Priorities

10. **At the time of appraisal, the Solomon Islands' 2016–2035 National Development Strategy placed emphasis on increasing electricity access and the promotion of renewable energy**. SIG aspires to ensure access for all to adequate, safe, and affordable housing and basic services and upgrade low-income areas by 2030. However, both MMERE and SP recognized that the high cost of connection is a serious impediment for new customers, especially low-income households, to connect.

Project Development Objectives (PDOs)

11. **The PDO,** as stated in the Project Appraisal Document (PAD) and in the Financing Agreement, was to increase access to electricity services in low-income areas of Solomon Islands.

Key Expected Outcomes and Outcome Indicators

12. **The project intended to provide energy access to the low-income households, community facilities, and microenterprises in targeted areas in the Solomon Islands.** As the first energy access project to be implemented by SP with a Results Based Finance (RBF) approach, the overall objective of the SIEAEP was to increase access to electricity services in low-income areas of the Solomon Islands to overcome high up-front costs of connection. An emphasis was also placed on connecting female-headed households to contribute to gender parity among project beneficiaries.

13. **The Results Framework in the PAD is used to evaluate SIEAEP's outcomes.** The PDO indicators used to assess the overall outcome of the project for the ICR are provided in table 1. There were also two intermediate indicators, "number of Light-Emitting Diode (LED) distributed and installed" and "community contribution (beneficiary contribution) to the total cost of the project".

Table 1: Results Framework and PDO Indicators Used to Assess SIEAEP

Objective/Outcome	Revised PDO Indicators
Increase access to electricity services in the low-income areas of Solomon Islands	People provided with new or improved electricity service - People provided with new or improved electricity service, female
	People provided with access to electricity under the project by household connections - People connected to electricity in Honiara - People connected to electricity in Outstations
	People provided with access to electricity through community electricity connections - People connected to electricity through community connections in Honiara - People connected to electricity through community connections in Outstations
	People provided with access to electricity through microenterprise electricity connections - People connected to electricity through microenterprise connections in Honiara - People connected to electricity through microenterprise connections in Outstations

Components

14. The project had two components:

- **Component 1 (GPOBA: US$ 2.125 million; Customer contribution: US$ 234,500; SP: US$ 545,063 at appraisal, GPOBA: US$ 2.124 million; Customer contribution: US$ 220,815; SP: US$ 684,561 at completion).** Output Based Aid (OBA) subsidies for new electricity connections and basic in-house wiring for low-income households, microenterprises, and community infrastructure; to partially subsidize new electricity connections to eligible households, microenterprises, and community services in target areas. Low-income households, microenterprises and community services located within the current grid, grid extension areas, and outstations as defined in the Project Operations

Manual (POM) and areas as agreed with the World Bank were eligible for a subsidized connection under the program.

The targeted connection numbers for each connection type were indicative and could be adapted depending on progress during project implementation. SP and beneficiaries contributed to the cost of connections. The procedure required beneficiaries to pay up-front amount of SBD200 (US$24) and the remaining amount of SBD 600 (US$76) for Honiara customers and SBD 200 (US$24) for Outstation customers was to be paid as 20 percent deductions from each top up of the prepaid meter. The end target for expected customer contribution was revised and the total customer contributions at completion exceeded the revised end target. SP contributed SBD 1,700 (US$213) for the first 20 meters pursuant to its current practices, and the OBA program subsidized the remaining amount for each eligible connection, and limited to a service line length of up to 80 meters with one auxiliary power, and in-house wiring[6]. SP contribution at completion exceeded the expected contribution at appraisal.

Table 2: Distribution of Connection Targets (original and revised) under the SIEAEP

Connection Target	Original			Revised		
	Honiara Grid	Outstations	Subtotal	Honiara Grid	Outstations	Subtotal
Number of household connections	2,125	440	2,565	1,568	672	2,240
Number of microenterprises connections	-	-	-	87	37	124
Number of community services connected	-	-	-	87	37	124
Total	**2,125**	**440**	**2,565**	**1,632**	**746**	**2,488**

- **Component 2 (GPOBA: US$0.1 million at appraisal, GPOBA: US$0.069 million at completion)** Implementation support for project management. Implementation support for project management included carrying out a program of activities to help a program manager (PM) oversee and undertake project implementation and management activities. The consultant was to provide support in (a) procuring materials for service lines and in-house wiring, (b) hiring licensed electrical contractors to perform in-house wiring, (c) managing distribution of materials, (d) administering or managing payments to suppliers and electrical contractors; (e) conducting awareness-raising campaigns for beneficiaries, (f) reporting to the IVA and the World Bank, and (g) performing other related activities.

15. **Independent Verification Agent (IVA):** As per the Grant Agreement dated August 15, 2016, it was agreed that an IVA would be recruited by the Association (the World Bank) to provide the World Bank and SP quarterly Output Verification Reports (OVRs) throughout the implementation of the project, as described in the POM. The verification process involved desk research, physical verification (of at least 30 percent of the connections from each claim), and submission of the OVRs to the World Bank. The IVA was financed from the World Bank administration budget, and a suitably qualified individual was hired as per the short-term consultant (STC) guidelines. The selection of the IVA under the World Bank was a well-thought-out decision considering that this was the first OBA program in the country and the IVA had an important role in project supervision and disbursement of project funds.

[6] Project Operations Manual, 2018: Solomon Islands: Electricity Access Expansion Project (P151618) Component 2 of Solomon Islands: Electricity Access and Renewable Energy Expansion Project (P162902) Output Based Aid program to promote access to electricity to low income households.

SIGNIFICANT CHANGES DURING IMPLEMENTATION

16. The project was restructured once in March 2018. The main changes are described in table 3. There were no changes to the original PDO.

Table 3. Key Changes to the SIEAEP during Restructuring

Date	Changes	Details
March 2018	**Change in Components and Cost**	Amended to include subsidize electricity connectivity to microenterprises and community infrastructure (in additional to low-income households) as eligible activities, to be paid at the same subsidy level.
	• Inclusion of microenterprises and community infrastructure in Component 1 • No change in Component 1 cost	
	Change in Results Framework	Change in end targets as a reflection of the addition of new types of connections being included, the increased number of connections in the outstations, and the longer implementation period.
	• All PDO indicators replaced by corporate sector indicators measuring similar results. Revised end targets. • Addition of new PDO indicators to reflect community infrastructure and microenterprise along with households • Segregation based on Honiara and outstations	
	Change in Financial Management	An IFR will be due forty-five days after the end of each calendar semester.
	• Frequency of submission of progress reports and unaudited interim financial reports (IFRs) reduced to each semester rather than every quarter	
	Change in Disbursement Estimates	Disbursement estimates were adjusted to reflect the new implementation period
	• Extended from June 30, 2018 to March 31, 2020	
	Change in Grant Closing Date	A revised implementation schedule has been adopted to ensure successful completion of project activities and achievement of the PDO by the new proposed closing date.
	• Closing dates of the GPOBA grant by 21 months from June 30, 2018 to March 31, 2020	
	Other Changes	A progress report will be due forty-five days after the end of each calendar semester.
	• The periodicity of submission of progress reports is changed from quarterly to each semester.	

17. **Changes in the indicators.** During restructuring, the results framework and implementation targets were revised to reflect the longer implementation period and the changes to Component 1 (described below), and to align indicators with corporate sector indicators. New PDO indicators were added to measure the breakdown of the number of people connected through household, community infrastructure and microenterprise connections financed under the project. The details are provided in table 4.

Table 4: Changes in the PDO and Intermediate indicators during SIEAEP's Restructuring

Original Project Indicators (2016)	Original End Targets	Revised Project Indicators (restructuring, 2018)	Revised End Targets
PDO Indicators			
PDO Indicator 1: Direct project beneficiaries	14,620	**PDO Indicator 1:** People provided with new or improved electricity service	15,498
Direct female project beneficiaries	7,050	People provided with new or improved electricity service -female	7,523
PDO Indicator 2: People in urban and peri urban areas of Honiara provided with access to electricity by household connection -Grid	12,113	**PDO Indicator 2:** People provided with access to electricity under the project by household connections (grid or off-grid)	12,770
		People provided with access to electricity under the project by household connections in Honiara	8,939
		People provided with access to electricity under the project by household connections in outstations	3,831
PDO Indicator 3: People provided with access to electricity from outstation mini-grids by household connection - renewable mini-grids	2,507	**PDO Indicator 3:** People provided with access to electricity through Community electricity connections under the project	2,480
		People provided with access to electricity through community electricity connection in Honiara	1,736
		People provided with access to electricity through community electricity connections in Outstations	744
		PDO Indicator 4: People provided with access to electricity through microenterprise electricity connections under the project	248
		People provided with access to electricity through microenterprise electricity connections in Honiara	174
		People provided with access to electricity through microenterprise electricity connections in Outstations	74
Intermediate Indicators			
Intermediate Indicator 1: Number of LED bulbs distributed and installed	4,250	**Intermediate Indicator 1:** Number of LED bulbs distributed and installed	7,111
Intermediate Indicator 2: Community contribution (beneficiary contribution) to the total cost of the project	234,500	**Intermediate Indicator 2:** Community contribution (beneficiary contribution) to the total cost of the project	220,664

Rationale for Restructuring

18. **More time was needed to achieve the project target of connecting low-income households and completing project implementation activities.** The project had suffered delays initially, but most of the bottlenecks had been addressed and implementation was accelerating. Despite the implementation progress, it would not have been possible to achieve the project development objective without an extension of the project closing date.

19. Moreover, at approval, the project was designed with an ambitious implementation plan of 18 months, tied to the end disbursement date (EDD) of the parent trust fund (TF). An extension of the closing date was expected at the outset. The EDD of the GPOBA multi donor TF was extended to December 31, 2022, allowing the extension of the recipient-executed trust fund supporting the SIEAEP by an additional 21 months, from June 30, 2018, to March 30, 2020.

20. During the restructuring, microenterprises and community infrastructure connection types were added under Component 1 to increase the project's impact in unserved communities and allow for a more holistic approach to support household-driven economic activity and access to basic community-driven services. Indicator end targets were revised as a reflection of the addition of new types of connections being included, the increase of the number of connections in the outstations, and the longer implementation period.

II. OUTCOME

RELEVANCE OF PDO

21. **The SIEAEP's objectives are highly relevant to the Country Partnership Framework (CPF) 2018–2023 (Report #122600) objectives, such as improving renewable power generation and access to electricity**, improving connectivity and improving access to service delivery in underserved communities The CPF further elaborates that limited access to affordable and reliable power supply in the Solomon Islands constrains economic growth in urban areas and contributes to poverty in rural areas. Improving access to affordable and reliable power was deemed an essential ingredient in not only helping ensure that future growth is sustained but also lasting peace and stability is secured. SIEAEP's objective of providing people with new and improved electricity access in the project contributed towards improving access to electricity and to service delivery.

22. **The project was well aligned with the overall strategy of providing energy access in Solomon Islands and building upon the World Bank SISEP project to strengthen the power sector.** The SIEAEP was the first energy access project undertaken by SP and provided critical segue between SISEP (approved in July 2008), which focused on strengthening the national utility, and the Solomon Islands Energy Access and Renewable Energy Expansion Project (SIEAREEP approved in October 2018; P162902), with a focus on renewable energy, increased generation and energy access. This reflects the programmatic approach taken in the sector rather than focusing on the individual projects. The project also fitted well with the major investment in the grid densification and grid extension by SP after a long period of no investment. By providing connection subsidies under SIEAEP, the project ensured that the low-income households were not left behind and could benefit from the electricity access. At the time of project completion, the PDO remained very relevant and as a result, an energy access component with the similar OBA financing structure was adopted for SIEAREEP project to ensure continuity. It is expected SIEAREEP will add an additional 1,500 connections in addition to approximately 1,300 applications that were transferred to SIEAREEP when SIEAEP closed.

23. **Rating.** At the time of project completion, the PDO remained very relevant. The project was able to deliver reliable power to low income households who due to the high costs of connections and wiring were unable to get connected. As a result, most households are now less reliant on costly and potentially dangerous alternative energy sources such as kerosene lamps, candles, and diesel-backed generators

24. The relevance of the PDO is therefore rated as **High**.

ACHIEVEMENT OF PDOs (EFFICACY)

Outcome: To increase access to electricity services in low-income areas of Solomon Islands

25. **The SIEAEP satisfactorily met the project outcome associated with the PDO.** The revised Results Framework indicators are used to assess the achievement of the outcome. Since the restructuring made adjustments to the Results Framework, a split rating was considered and rejected for the following reasons: (a) there were no changes to the PDO, and (b) the restructuring did not introduce substantial and/or material change to key outcome indicators, project scope, and the associated level of ambition. Achievement of PDO indicators is summarized in Table 5. More detailed explanation of achievement of the indicators is provided in further paragraphs of this section.

Table 5 Efficacy Ratings for Each Outcome of the PDO Based on Achievement Ratio

PDO Indicators	Revised End Target	Actual	Achievement Ratio (%)	Comment
Outcome: To increase access to electricity services in low-income areas				**Efficacy rating: Substantial**
PDO indicator 1: People provided with new or improved electricity service	15,498 (2,488 HHs)	14,605 (2,488 HHs)	94	Overall connection target was achieved. However, the number of people provided with access was substantially met.
People provided with new or improved electricity service, female (49% of people provided with new or improved electricity service).	7,523	7,090	94	The target was substantially met. Females including female headed HHs benefitted from connection and had many developmental impacts.
PDO indicator 2: People provided with access to electricity under the project by household connections	12,770	13,697	107	HH connections exceeded target and the beneficiary survey was able to capture many benefits beyond access.
People provided with access to electricity under the project by household connections in Honiara	8,939	9,650	108	
People provided with access to electricity under the project by household connections in outstations	3,831	4,047	105	
PDO indicator 3: People provided with access to electricity through community electricity connection	2,480	820	33	Partially met. Community connection target was added in 2018 and could have benefitted from customized campaigns and coordination.

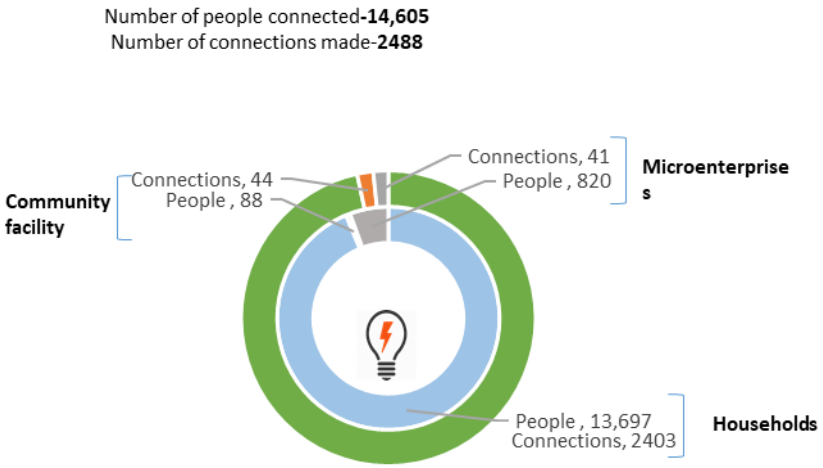
People provided with access to electricity through community electricity connection in Honiara	1,736	280	16	
People provided with access to electricity through community electricity connections in Outstations	744	540	72	
PDO indicator 4: People provided with access to electricity through microenterprise electricity connections	248	88	35	Partially met. The same was true for microenterprises but many HHs started economic activities once connected to the grid demonstrating benefits beyond access.
People provided with access to electricity through microenterprise electricity connections in Honiara	174	76	44	
People provided with access to electricity through microenterprise electricity connections in Outstations	74	12	16	

Note: HH = Household.

PDO indicator 1: People provided with new and improved electricity

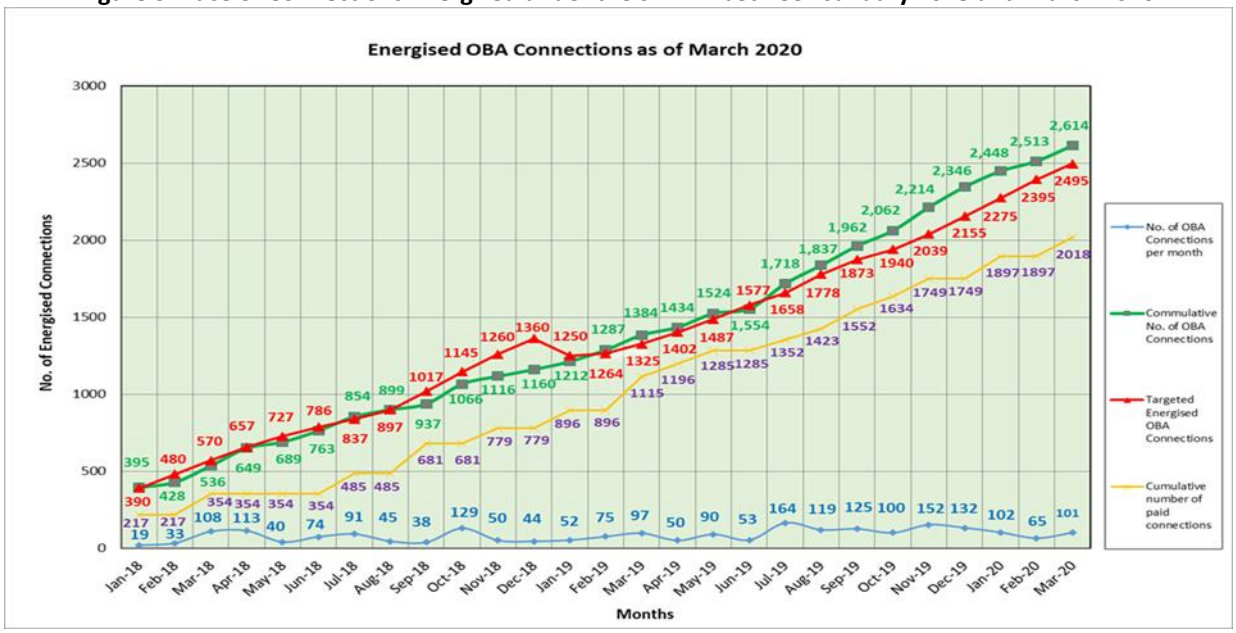
26. **Under the SIEAEP project, fourteen thousand, six hundred and five 1people were connected (14,605/15,498) with new and improved electricity service.** Overall, 2,488 connections were energized (figure 2) broken down between household connections (2,403), community service connections (44) and microenterprise connections (41). The number of people in a household was based on Household Income Expenditure Survey 2012-2013 average household size (5.7 persons), people per microenterprise was estimated at 2 persons and community services was estimated at 20 persons. As described below, the number of households connected exceeded the end target, while the total number of community services and microenterprises connected was less than expected. As a result, while the number of targeted connections (2,488) was met, the methodology for calculating the total number of people connected meant that number of people connected was only substantially met.

Figure 2. People Provided with New or Improved Electricity Service



27. **The initial claims for subsidy were not meeting monthly targets as uptake was slow**. The project experienced some initial implementation delays due to (a) delays in the procurement and delivery of materials, (b) issues linked to the difficulty faced by applicants in showing valid land titles as part of their application for obtaining an electricity connection, and (c) delays in the recruitment of the program manager. Another significant reason for the low connection rate was that customers were waiting for the low-voltage (LV) line extensions that were delayed or not yet planned and resulted in a backlog of applications building up throughout implementation. This was a barrier to achieving more connections and affected the total number of connections achieved. However, the implementation accelerated considerably in 2018 once some of these bottlenecks were removed. Figure 3 shows that from January 2019 onward, the OBA connections were consistently meeting or exceeding monthly targets set by SP; the following sections discuss some of the key aspects behind the success of the project.

Figure 3. Pace of Connections Energized under the SIEAEP between January 2018 and March 2020



28. **Effective awareness campaigns targeted toward households were helpful in increasing applications numbers.** To encourage eligible low-income households to apply for an OBA connection, SP increased its customer awareness events in five areas across Honiara (Adaliua, Feraladoa, Kwaio Valley, MBokona, and White River) throughout August and September of 2018. This was done in addition to customer awareness events planned for network extension areas. Along with in-person awareness events, the team developed an OBA pamphlet which included information on OBA connections, the application process, payment modality, and electricity safety. These informative campaigns were critical in raising awareness about the OBA program and provided basic knowledge on electricity usage as most of these households had not used electricity before. The targeted awareness campaign helped in overcoming the low rate of application which was a challenge in the first half of project implementation period and even led to more applications for connection (4,064) than connections achieved (2,488). As a result, SP temporarily stopped taking new applications from January 24, 2020, to manage community expectations which allowed SP to focus on clearing the existing backlog of applications.

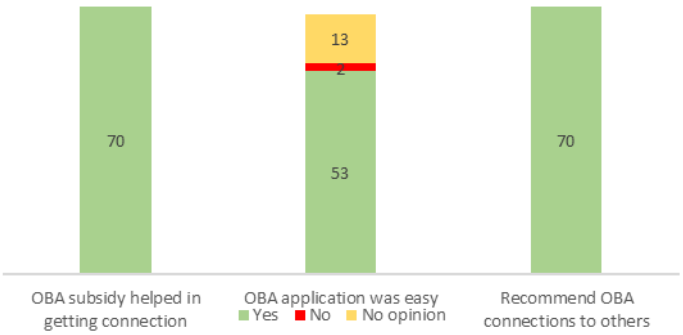
29. **Number of people provided with new and improved electricity service, female (7,090/7,523).** The corporate supplement was a relevant indicator included in the project to focus specifically on tracking the number of females connected through the project measured as 49 percent of the people provided with new or improved electricity service (PDO Indicator 1). This indicator was substantially met.

PDO indicator 2: People provided with access to electricity under the project by household connections (grid or off-grid)

30. **The household connections exceeded the target both in terms of people connected (13, 697/12, 770) and household connections (2,403/2,240).** Similarly, the sub-indicators measuring the number of people connected in Honiara (9,650/8,939) and number of people connected in outstations (4,047/3,831) were exceeded. After an initial slow start, the household connection rate picked up after restructuring in March 2018 and by the close of the project exceeded the target (107 percent).

31. **OBA subsidy was critical in overcoming the high connection cost** as the surveyed households acknowledged the importance of the OBA subsidy in getting an electricity connection which was otherwise unaffordable for the low-income households (figure 4). The results show that the project not only exceeded in terms of achieving this target, but there were many added development benefits for low-income households other than the electricity access.

Figure 4. Impacts of OBA Connections

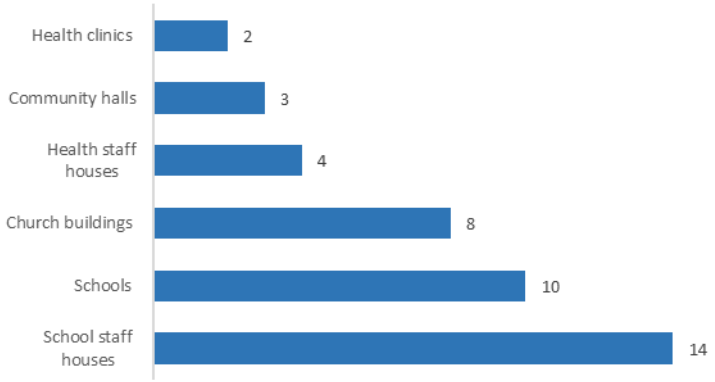


PDO indicator 3: People provided with access to electricity through community electricity connections under the project

32. **The project connected 820/2,480 people and altogether 41/150 community services were provided with connections through OBA subsidy.** The sub-indciators measuring people connected through community service connections in Honiara (280/1,736) and people connected through community sercice connections in outstations (540/744) were partially met. There are significant benefits in providing electricity access to these community services as they play an important role in providing basic community services and/or enabling community gathering and cohesiveness. The configuration (number of bulbs/power points) was the same as that of a normal household. However, the project recognized that some of the households may be larger and these facilities would be allowed to extend the in-house wiring and/or upgrade the type of connection provided using their own funds.[7] The target of connecting 144 such community services was partially met with only 41 community services connected.

[7] Residential connections and canteens would only be allowed to alter the technical configuration or extend in-house wiring after 1 year of operation.

Figure 5. Types of Community Services Energized



33. Figure 5 shows types of community services connected under the OBA project: health clinics (2), community halls (3), schools (10), and school staff houses (14). These are an integral part of any community; for example, providing electricity connection to staff quarters for teachers and health workers ensures that they are motivated to remain in targeted communities. There are many benefits of connections to schools such as improvement in attendance and access to modern technologies for teaching. The same goes for the health clinics and use of electricity for storage of vaccine, medical equipment, and so on can have major health benefits for low-income communities.

34. The project was not able to reach the desired number, and this could be attributed to time constraints, lack of targeted strategies, ambitious targets, mismatch between grid extension and applicants, or different technical specifications for the electricity connection. The continuity of the component under SIEAREEP with a better strategy and support would be needed with additional information on their needs and demand analysis.

PDO indicator 4: People provided with access to electricity through microenterprise electricity connections

35. **Under the project, 88/248 people were provided with access to electricity and in total 44/150 connections were made**. The sub-indciators measuring people connected through mircoenterprise connections in Honiara (76/174) and people connected through microenterprise connections in outstations (12/74) were partially met. Microenterprises were primarily identified as canteens in the form of small-family-managed shops which were outside of the Honiara central business district. As running a canteen represented an opportunity for income generation in these communities, providing electricity connection to these microenterprises could enhance their ability to do business and improve livelihoods. It is noted that the microenterprises are often constrained by lack of energy or dependence on highly inefficient fuels or illegal electricity connections (Butera and Caputo 2016)[8].

36. **Targeted awareness campaign and incentives could have improved the connection rate in this category.** A focused awareness campaign was not conducted for the microenterprises as part of the project and many did not know that the subsidized connection under the OBA program was available to them. Other than the access to electricity, microenterprises need other facilitating factors, especially in low-income communities. The evidence provided by the Productive Use of Energy (PRODUSE) study (Mayer-Tasch, Mukherjee, and Reiche 2013)[9] points out that the absence of facilitating factors such as sensitization, access to finance, public infrastructure, and business development services can hinder economic activities in a low-income community despite access to electricity

[8] F. M. Butera, P. Caputo, R. Adhikari, A. Facchini. "The Challenge of Energy in Informal Settlements. A Review of The Literature for Latin America And Africa."
[9] *Mayer-Tasch, Mukherjee, and Reiche 2013, "Productive Use of Energy – PRODUSE Measuring Impacts of Electrification on Small and Micro-Enterprises in Sub-Saharan Africa", GIZ and ESMAP*

connection.[10] It is important to recognize that electrification is a long-term investment and a necessary input for long-term economic transformation (Blimpo and Cosgrave-Davies 2019)[11]. Incentives, barriers, and challenges associated with connecting microenterprises can be further explored given the continuity of the program under Component 2 of SIEAREEP. Lessons and insights can equip the SIEAREEP team with a better strategy and implementation plan to maximize the benefits of electricity access, economic gains, and job creation in low-income areas. As per beneficiary survey, many households starting business activities once getting electricity access.

37. **The IVA managed by the World Bank worked well in this case.** The main institutional solution adopted by the GPOBA and, in some cases, the World Bank, has been the use of external firms or consultants (both local and international) for verification of results which could be carried out by various parties, including government agencies, semiautonomous. In the case of the Solomon Islands, the OBA approach to hire an independent consultant was adopted for the SIEAEP for results monitoring and verification. This was decided based on the independence criterion and capacity assessment of SP and MMERE. Given that SP was the implementation agency for the SIEAEP, it was ruled out for IVA implementation because of conflict of interest. The assessment of MMERE revealed its limited capacity to implement the independent verification component, and based on these assessments, it was finally agreed that the World Bank would implement the IVA part of the project. In November 2016, the GPOBA approved funding to support the supervision and IVA portion of the project once the Government and other stakeholders were informed of this arrangement. The details were provided in the POM and it was decided that competitively selected consultant would act as an IVA. S/he would be responsible for the verification of outputs and for providing recommendations to the team for disbursements.

38. **Independent verification process was thorough and timely**. The World Bank appointed an IVA in October 2016. The IVA started to review the claims for verification and conduct physical verification in March 2017. The role of the IVA was to verify that the delivered outputs followed agreed specifications and recommended payment of subsidies. The IVA was responsible for producing OVRs on the OBA implementation process and outcomes. The OVRs were prepared quarterly or when the minimum threshold for a claim was reached. The OVR summarized desktop verification work, which involved an assessment of records/files of OBA beneficiaries, and physical verification. The POM required that, at a minimum, 30 percent of beneficiaries were physically verified for each claim, and the IVA certified that the wiring was properly installed and was functioning according to the required standards stated in the POM. Over the implementation period, the IVA submitted 21 detailed OVRs (see table 6 for details).

Table 6. Number of Claims Verified by the IVA

	Honiara	Outstations	Total
No. of connections claimed (total)	1,745	743	2,488
No. of connections claimed (household)	1,686	717	2,403
No. of connections claimed (non-household)	59	26	85
No. of recommended connections (total)	1,745	743	2,488
No. of recommended connections (household)	1,686	717	2,403
No. of recommended connections (non-household)	59	26	85
Total subsidies recommended (US$)	1,385,530	738,542	2,124,072
Total estimated average costs (US$)	794.00	994.00	1,788
Total household contribution paid to date (SBD)	349,000	148,600	497,600
No. of physical verifications	521	225	746
Ratio of physical verifications (%)	30	30	30
No. of female-headed households	375	180	555

[10] PRODUSE is a joint initiative of ESMAP, the Africa Electrification Initiative, the EU Energy Initiative Partnership Dialogue Facility, and the German Agency for International Cooperation (Deutsche Gesellschaft für Internationale Zusammenarbeit). Further information can be found at www.produse.org.

[11] "Blimpo, Moussa P.; Cosgrove-Davies, Malcolm. 2019. Electricity Access in Sub-Saharan Africa: Uptake, Reliability, and Complementary Factors for Economic Impact. Africa Development Forum; Washington, DC: World Bank. © World Bank. https://openknowledge.worldbank.org/handle/10986/31333 License: CC BY 3.0 IGO."

JUSTIFICATION OF OVERALL EFFICACY RATING

39. **Households, community services and microenterprises within target areas received a connection to the electricity grid as a direct result of subsidies provided through the project.** The number of target areas was increased during project implementation to respond to the high level of demand for the program. The original target areas included Honiara, peri-urban areas of Honiara and three outstations, while following the project restructuring in 2018 the original target areas were expanded to include areas specified in the implementation plan and agreed with the Bank. As a result, households, microenterprises and community service connections were achieved in seven target areas across Solomon Islands. The project contributed meeting energy access targets in Solomon Islands. The project's achievements can also be attributed to work done under the SISEP to reform the national utility SP and the continuation through SIEAREEP of the energy access component (component 2). The overall efficacy rating is **Substantial**.

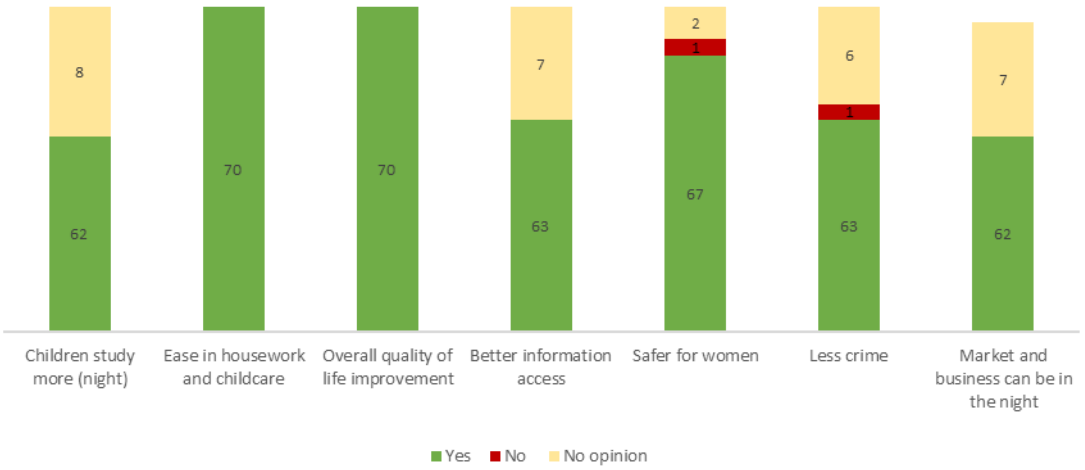
OTHER OUTCOMES AND IMPACTS

40. **In recent years, there has been a move toward more nuanced data on energy access, including access to electricity.** The Multi-Tier Framework (MTF) approach developed by the Energy Sector Management Assistance Program (ESMAP) (World Bank) and adopted by many projects goes beyond the traditional binary measurement of energy access (for example, having or not having a connection to electricity) to the vast range of technologies and sources that can provide energy access, while accounting for the wide differences in user experience.[12] The MTF approach was not used in this project, but the essence of this approach to understand the beneficiary experience is captured through a similar approach in a small household survey conducted at the end of the implementation to reflect broader benefits of energy access. This was an anecdotal survey with 70 households (OBA connections only) selected in targeted areas. The 70 households were divided into 20 households with female heads, 20 households with some economic activities, and 30 other households. The households with OBA connections for at least one to two years were chosen to understand the benefits and impacts in their overall socioeconomic conditions and perceptions. The independent verification process conducted during project implementation also involved a brief household survey of 30 percent households from each claim. However, while the data were not quantified, relevant qualitative feedback was included in the OVRs.

41. **There were many positive impacts beyond OBA subsidy and electricity access.** The beneficiary survey tried to capture some of the impacts even though these were not part of the project. The survey reflects how the overall quality of life of beneficiaries was enhanced and improved by the electricity connection. The beneficiaries reflected on the qualitative benefits which provided nuanced understanding of some of the developmental impacts. These qualitative improvements were based on beneficiaries' experiences such as extended study time for students, longer business hours, safety for women and girls, and other impacts. Figure 6 presents perceived benefits of electricity connection by the beneficiaries who have been connected to the grid for at least one to two years.

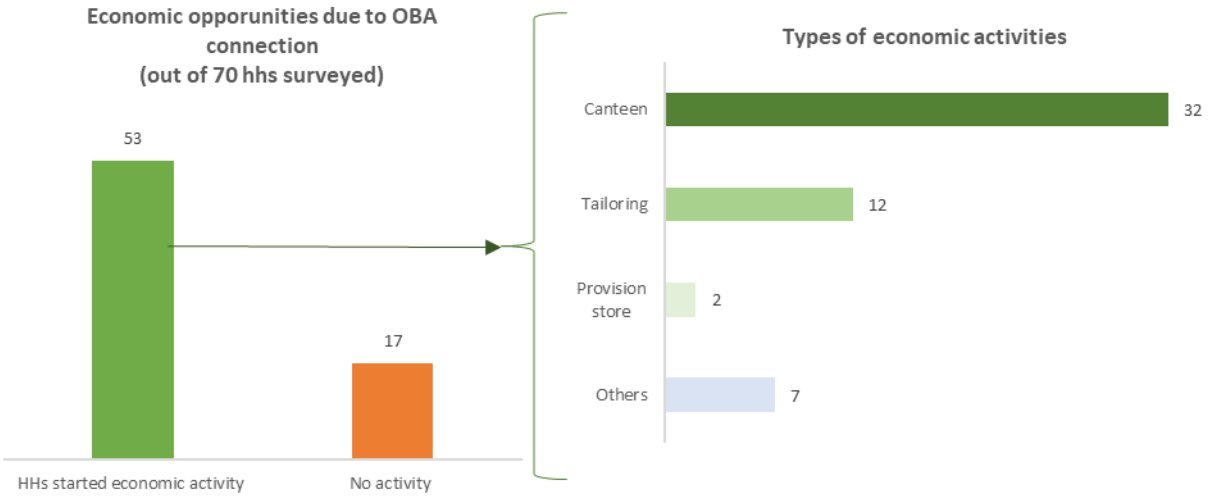
[12] The MTF access rate includes access provided by off-grid technologies, which is often excluded by the binary rate, but excludes grid connections that do not meet its criteria for the minimum level of service.

Figure 6. Benefits of Electricity Connection Perceived by Households



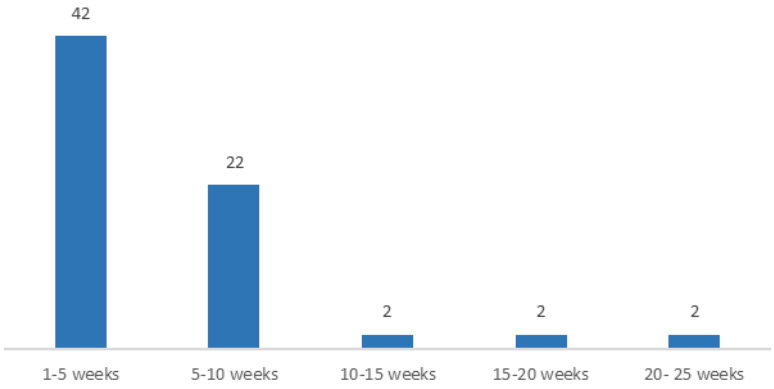
42. **Many households started economic activities upon getting electricity connection through the project.** Figure 7 shows that 57 out of 70 households started some economic activity, which amounts to 81.4 percent of households. It has been documented that the benefits of electricity access beyond lighting take time because the consumers—whether households or firms—need time to adapt to the new situation after electrification. These numbers are highly encouraging as many households started small canteens (32 percent), followed by tailoring (!2 percent), provision stores (2 percent), and others (7 percent). This happened despite any targeted plan or campaign to focus on stimulating productive uses of electricity.

Figure 7. Economic Impacts of OBA Connection



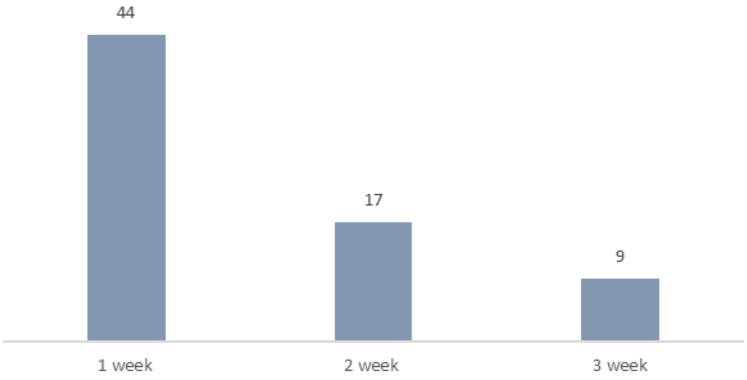
43. **Institutional strengthening (capacity building and streamlining to manage projects).** The project support component has been helpful in streamlining the processes within SP and implementing the energy access project has been a learning experience. This not only helped SP successfully implement the SIEAEP but will also benefit ongoing (SIEAREEP) and other future projects. It is hard to assess progress made in terms of how the process had improved during the project cycle, but attributes such as ‘time to process applications’, ‘length of the energization period’, and ‘overall quality of electricity’ from the beneficiary side could provide some insights.

Figure 8. Time to Get OBA Connection (Application to internal wiring)



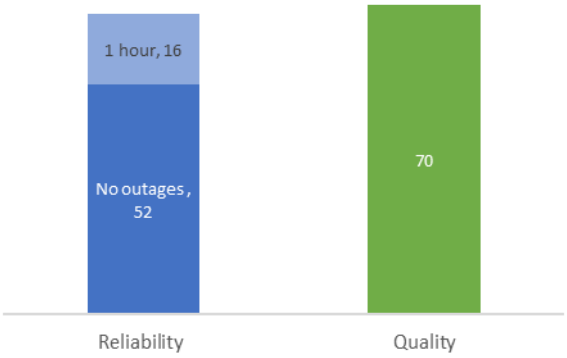
44. Figure 9 shows how the application process improved over time. Majority of applications for low-income households under the OBA connections were approved within 1–10 weeks (64 percent) whereas initially it could take 5 month or more (figure 8). Another example to corelate improvement in efficiency is how quickly households were energized once the internal wiring was done. The beneficiary survey showed that majority of households were energized within a week (44 percent) and were able to start using electricity (figure 9). This output shows that SP and the OBA team were well coordinated, and the extension of the grid network (service lines) was eventually well matched with the OBA connections and application process.

Figure 9. Time for Connection Energization (Internal wiring to turning on the bulb)



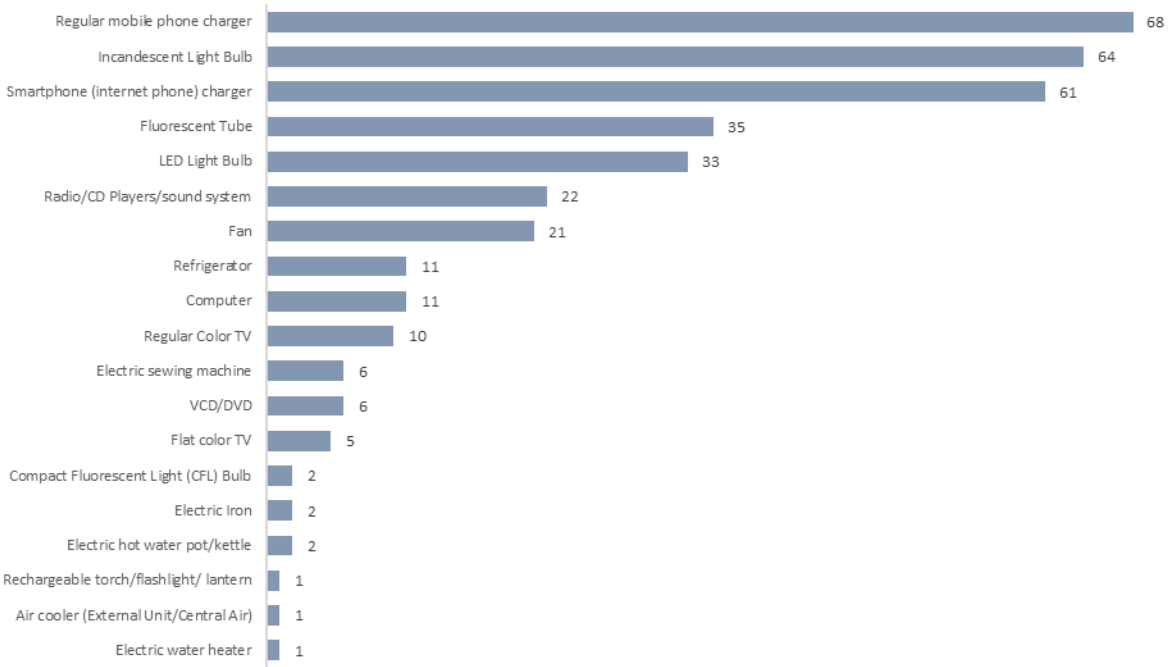
45. **Households enjoy good quality and reliable electricity.** As per the MTF, having an electricity connection does not necessarily mean just having access to electricity and the framework takes other aspects into account, for example, reliability (outages) and quality (voltage fluctuation), as these are important aspects of the beneficiary's overall energy access experience. The improvement in overall quality of energy supply was not part of the SIEAEP; however, the survey results showed that OBA households enjoyed reliable and quality electricity. None of the 70 households (100 percent) reported any appliance damage due to voltage fluctuation, while 52 households did not report any outage (74 percent), and only 16 households reported one-hour outage per week (figure 10).

Figure 10. Grid Service for OBA Connected Households (only for surveyed households)



46. **Beneficiaries of OBA connections (one to two years) have moved up the energy ladder.** Many households bought appliances after getting OBA connections, including for economic activities. As discussed earlier, households need some time to learn how to use electricity other than meeting basic needs such as lighting, and climbing up the electricity consumption ladder or starting economic activities takes even longer, mostly three to nine years (MTF 2019).[13] The results shown in figure 11 were encouraging given that many households bought these appliances within one to two years of OBA grid connection. For example, some families bought refrigerators (11 households) and computers (11 households) which could be easily used for income generation activities (figure 11).

Figure 11. Appliance Use (OBA-connected households surveyed)



13 *https://www.worldbank.org/content/dam/Worldbank/Topics/Energy%20and%20Extract/Beyond_Connections_Energy_Access_Redefined_Exec_ESMAP_2015.pdf*

47. **Adoption of the OBA approach by other donors.** Led by SP, the overall success of the SIEAEP caught the attention of other donors, and after seeing success in connecting low-income households, New Zealand Ministry of Foreign Affairs and Trade (MFAT) is using a similar approach for their energy access project and has provided NZD 1.7 million (US$1.23 million) to SP to continue connecting low-income households under the OBA subsidy approach, while the Asian Development Bank (ADB) is in discussions with SIG to adopt a similar modality on one of their financed projects. SP's keenness to adopt and further strengthen the OBA approach is encouraging and provides another example of the project success.

48. **While outside of the results achieved by the project, the impact of COVID on the power sector is felt in the Solomon Islands and the extent will depend on the length of the pandemic and lifting of travel restrictions.** There was a drop in overall electricity demand by 13 percent in April 2020 and reduction of diesel fuel consumption by 23 percent. To ease economic pressure, the Government decided not to make any changes to the current tariff and neither to disconnect any postpaid customers due to default payment. However, there will be delays in adding new generation and transmission lines due to commissioning and site work delays, mostly related to travel restrictions. There has been some interruption in the solar supply chain, thus affecting commencement or completion of solar projects, and SP is anticipating that it will not be able to meet its target of connecting 3,000 customers this year. COVID-19 might also affect SP's overall OBA commitments and targets due to the shortage of cash power meters as these are supplied by a company based in New Zealand and the shipment being affected due to COVID-19 and SP is taking steps to mitigate these risks.

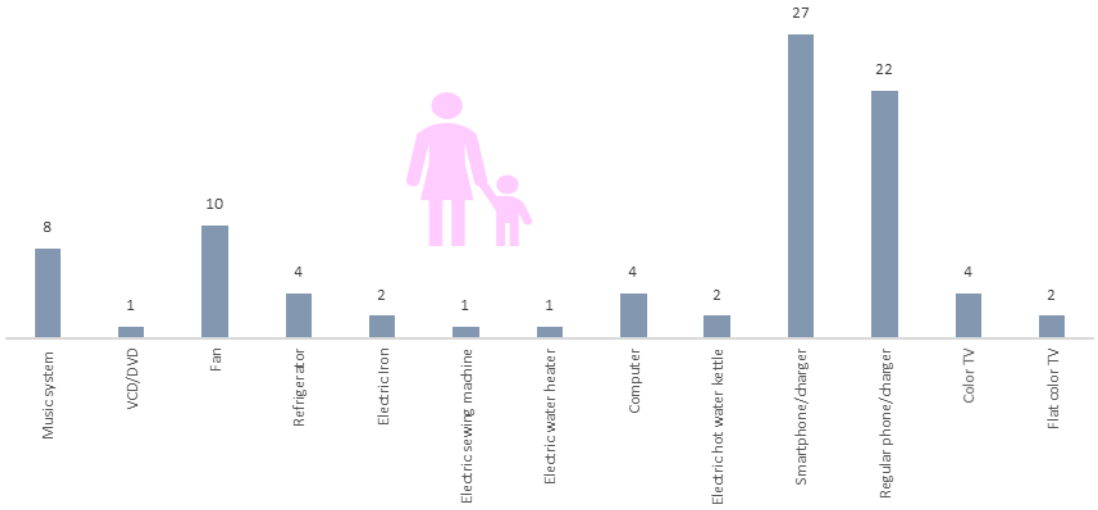
Gender Impacts

49. **The project tracked the number of female-headed households who received a connection.** A total of 504 female-headed households were connected under the project, of which 324 were in Honiara and 180 were in the provinces. The evidence from the 2009 Population and Housing Census Report on Economic Activity and Labor Force showed that 75 percent of employed women were mostly involved in unpaid activities related to family work, such as producing goods for family consumption (subsistence), and time-consuming activities, such as cooking, washing, and gathering wood. It is seen in other countries that connecting power to time-saving appliances can help alleviate the physical and time use burden of these activities, particularly for women. The combination of savings and reliable power presents further opportunities for entrepreneurship, for instance, phone charging or refrigerated drinks sales. The female-headed households and microenterprises benefitted from the OBA-subsidized connection and this was critical given the gender inequality inherent in the Solomon Islands.

50. Female-headed households are less likely to have access to energy than male-headed households if not targeted specifically. In general, lighting and TV are the first common uses of electricity, and electrification has several important gender impacts, in addition to the reduction in time poverty. For example, electricity displaces candles and kerosene lamps, reducing indoor air pollution and fire and burn risk and providing higher-quality light. This benefits women more than men, as women tend to spend more time at home. Lighting, radio, and TV help improve access to information, increase the ability to study, and extend the effective working day. Lighting also improves the productivity of many household activities and has potential benefits for public safety and expanded income-generating opportunities.[14] Figure 12 shows that the gender impacts of connecting female-headed households were not just limited to the safety and ease of daily chore but also affected their economic well-being and access to information. Twenty female-headed households were surveyed as part of the beneficiary survey and they altogether bought 49 phones after connecting to the grid. Appliances such as fans (10), refrigerators (4), electric kettle (1), iron (2), and water heater (1) eased their daily burden and computers (4) and sewing machines (1) added to their income generation.

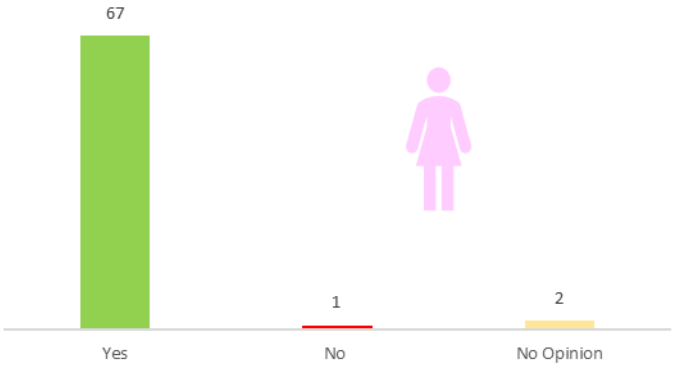
[14] https://www.esmap.org/sites/esmap.org/files/DocumentLibrary/Gender_Energy_M02.pdf

Figure 12. Appliances Bought by Female-headed Households



51. As per figure 13, majority of households shared that the crime rates have gone down since they had electricity access, and this factor also contributed to the safety of women and girls (67 households, 97 percent of respondents). This was relevant both at the household and microenterprise levels, especially if they were headed by females. As discussed above, lighting also extended business hours and allowed performing family work such as washing or cooking after dark. This was an important aspect related to gender: when women do not feel secure walking alone before dawn or after sunset, they restrict their activities and movements, reducing personal empowerment and affecting educational and business opportunities.[15]

Figure 13. Electricity Has Improved Women's Safety



[15] https://energypedia.info/wiki/Gender_Impacts_of_Energy_Access#cite_note-Power_Africa_.282017.29._Exploring_the_Relationship_Between_Energy_Access_and_Gender-Based_Violence._Available_online_at:_https:.2F.2Fmedium.com.2F.40PowerAfrica.2Fexploring-the-relationship-between-energy-access-and-gender-based-violence-ee8d9e320437-3

III. KEY FACTORS THAT AFFECTED IMPLEMENTATION AND OUTCOME

Key Factors During Preparation

52. **Readiness of the utility to implement the energy access project.** The utility had benefited enormously through the SISEP to improve its technical and financial efficiency, and despite these gains there were initial hiccups and capacity challenges to implement the OBA project. SP implemented its first-ever energy access project (SIEAEP) and the results-based OBA approach and did not have any experience on technical specifications and overall management of an access project. The project required sourcing technical components; selecting targeted areas; hiring a PM; and complying with the OBA procedures such as reporting, filing subsidy claims, and so on. The lack of experience and capacity led to initial delays in the project implementation and contributed to low outcomes in terms of number of applications, connections, and delays in submitting OBA claims. Hence, it is important to understand the utility's need, and some may require technical assistance and project management support, knowledge sharing, and flexibility to overcome the learning curve before project implementation takes off. This reinforced that a capacity-building component based on the needs assessment of the implementing agency would be highly beneficial.

53. **Lack of data and definition of low-income households.** Projects mostly follow the Government's definition and data while preparing energy access to set the baseline and low-income thresholds, but these were not available in the case of the Solomon Islands. The OBA program was intended to target subsidies specifically to low-income households. In the absence of quality and comprehensive socioeconomic data, the following selection criteria were agreed: (a) 'geographical targeting' where all households within the specified distance from the connection point are eligible since rural household incomes are generally low and (b) 'self-targeting' where households agree to be locked in for 12 months to the lowest installation specification of 10 ampere. Those households that increased the maximum load capacity (i.e. exceeded 10 ampere) before the 12-month period had to pay back the subsidy. This self-selection mechanism was considered consistent with the current practice and avoided the need for more administratively complex and costly alternatives, such as income surveys. However, challenges associated with the lack of data, digitization, centralized system, and coordination were felt throughout the project implementation.

Key factors during implementation

54. **Human resources, technical, and organizational capacity.** The project implementation suffered from initial delays and at some point, the project performance was downgraded to Moderately Satisfactory for both implementation progress and progress toward the development objective. Despite strong support for the program by both MMERE and SP, project implementation advanced at a slow pace and it was deemed difficult to complete all connections envisaged under the project by the closing date of June 30, 2018. Project disbursement stood at only 0.6 percent of project funds at the time of restructuring and despite project being effective on November 2, 2016. Many reasons contributed to the delays and a few are discussed here:

- **Human resources.** SP did not have enough in-house expertise and it was difficult even to attract talent from other countries. This is a generic problem in small island nations, and even in the Solomon Islands, finding a qualified person for the independent verification process (IVA) was a challenge and the same was true for a PM. This prompted SP to manage the OBA project internally initially and there was no dedicated team to implement the OBA component.

- **Technical capacity and expertise.** The technical components were supposed to be purchased by the utility as the implementing agency. The utility did not have enough knowledge and expertise to successfully source components with technical specification as per the configuration desired under the project. It needed handholding from the World Bank team and experts in the beginning, and despite initial delays, this contributed to its own capacity building and later led to the success of this project.

- **Organizational capacity.** The utility did not have existing capacity within the organization to follow different procedures and requirements under the OBA project. Developing processes and matrices took time, which led to delays and a smaller number of applications, which resulted in a low connection rate till 2018. This was exacerbated by delays in submission of claims by SP to the World Bank to get reimbursement and hence the connection numbers were not reflected officially. This created backlog of claims and there were also challenges with the coordination within the different teams, which led to mismatch between awareness campaigns, potential connections, and availability of LV lines. Over time, the team became well versed with the OBA guidelines and requirements and created separated systems for OBA connections and customers.

55. **As a result of early implementation challenges, SP provided resources and support to the OBA team to facilitate project implementation.** The project was implemented by the dedicated OBA team (PM, a technical officer, two logistics and technical support officers, an administration and finance officer, and a store and dispatch officer) in coordination with the various SP departments (customer service, planning), which improved the overall efficiency, internal procedure harmonization, procurement, supply chain management, and so on. To manage the project efficiently and within the desired costs, SP identified three contractors for service lines and five contractors for in-house wiring work for Honiara and Auki and two contractors in Western Provinces (Seghe and Taro). This was a challenge for the project implementation as there were a limited number of qualified contractors who could perform the service line connections and in-house wiring as per the project specifications. This affected the speed at which implementation could progress and the households were capped depending on the number of contractors available and the volume of work those contractors could manage. To overcome this, SP created a wiring board and circuit to train contractors as per the project specification and configuration. SP also reviewed the contract for in-house wiring to include the new household wiring configuration as approved in the project restructuring (three bulbs, three switches, and two power outlets). However, incorporating a capacity-building component in the future energy projects would be highly beneficial to create a local talent pool and will help in bringing the overall project cost down. The SP staff based in the outstations credited the OBA program with providing streamlined processing and accelerated approval timelines from the individual departments in SP headquarters in Honiara.

56. **Moreover, a dedicated management team was critical to its success.** The team was also strengthened by 2019, and a permanent PM was appointed after significant delay. SP chose an internal candidate as PM, who started on May 20, 2019. The selected PM was able to help streamline the process between different teams within SP, ensure optimal supply of wiring components, and ensure timely submission of monthly claims for the OBA subsidy. The position was transferred to SIEAREEP's OBA component after project closure on March 31, 2020. Having a dedicated PM not only allowed SP to clear its backlog of unclaimed connections but also helped accelerate the connection rate.

57. **Delays in filing OBA claims.** This was a challenge throughout the implementation period and affected the rate of connections that were verified. For example, between the start of the project in July 2016 and March 2017, SP energized only 99 connections and presented its first pilot subsidy claim for 16 energized connections, which was paid after verification by the IVA. The delays continued in 2018, although improvements were made. The OBA team improved its file management system after review of the file management system by the World Bank team. In 2019, the rate of connections being energized and subsequently being included in a claim improved significantly, but still an average delay of three months backlog of connection to be claimed for verification persisted. This was flagged as one of the issues in many of the Aid Memoires throughout project implementation.

58. **Overcoming the land title challenge for low-income households.** As discussed earlier, requirement of land titles as part of the application process for low-income households proved to be a major barrier. Resolving the land title issue for households in Honiara was the tipping point for project implementation, which led to an increased number of applications and final connections. This was achieved through effective coordination, pragmatic approach, and efforts between different stakeholders involved in the project.

59. **The project took off after resolving initial implementation delays and development of an Implementation Plan.** In the initial stage of project implementation, there was some challenge with the mismatch between applicants and LV lines. Some of the applicants were approved for connection in areas that had no LV electricity line and some applicants gave wrong addresses in their application forms. Due to the absence of a preassessment survey to cross-check information as well as distance from the LV lines, the OBA team faced some challenges in the field in connecting these households. The implementation plan developed by SP was updated after restructuring in 2018 based on the rate of connections, line extensions, and community awareness programs. The updated plan included more awareness campaigns to be undertaken in existing network areas and more LV line extensions to be completed in Honiara and the provinces. SP proposed to have the OBA program extended to Malu'u and Gizo grids where there were a large number of potential OBA customers. Based on these findings, it was agreed that SP would: (a) prioritize approved applications that did not require LV line extensions, (b) manage the expectations of customers who had paid for a connection but were waiting for lines to be extended, and (c) consider not accepting payment from customers in areas that had no line. The updated implementation plan after restructuring and the fully functional OBA team in 2019 were instrumental in streamlining the process and implementation, and the project was able to achieve its target within the project deadline.

60. **Changing 5 ampere to 10 amperes[16] limitation.** The initial eligibility criteria were set at a maximum 5-ampere capacity which was the lowest specification offered by SP at the time. Following initial communication awareness-raising events in 2016, SP reported to the World Bank that it had received fewer applications than anticipated because of the 5-ampere limitation introduced during project preparation. The connection limit was raised to 10 Ampere (higher connection capacity) after discussion and monitoring by SP in February 2017. An amendment to the POM was prepared to that effect and was signed on March 6, 2017. The criteria eventually used for beneficiary eligibility were as following:

- Beneficiaries fell under the prepaid residential category.
- Beneficiaries did not have a previous connection under their name. Service connection was capped to 10 amp for 12 months.
- Service connections were individual and could not be shared with other households.

[16] An ampere is the unit used to measure electric current. Current is a count of the number of electrons flowing through a circuit. One amp is the amount of current produced by a force of one volt acting through the resistance of one ohm.

IV. BANK PERFORMANCE, COMPLIANCE ISSUES, AND RISK TO DEVELOPMENT OUTCOME

Monitoring and Evaluation (M&E)

M&E design.

61. SIEAEP's objectives were clearly defined and directly responded to the need to expand energy access in Solomon Islands. The PDO was clear and the PDO indicators are mostly considered to inform the outcome. The IVA was implemented by the World Bank and the experience has demonstrated that qualified IVA can act as capacity-building catalyst for project partners to improve their project management practices. This is a regular practice in many OBA-funded projects in other countries, and the Government was also onboard with this approach to avoid conflict of interest and maintain independence and did not have the capacity to implement the IVA at the time.

M&E implementation.

62. **The Results Framework was revised during restructuring to replace the existing indicators with core sector indicators and revised end targets.** However, the focus on the number of people served as opposed to the number of connections made might not have been an accurate measure because in Solomon Islands data are neither sufficient nor updated regularly and thus can easily become outdated and unreliable. The end targets for community services and microenterprises were established using the requests and connections that had been received before the inclusion of these types of connections through restructuring in March 2018. While no specific study was conducted at the time, the targets were validated by the implementing agency based on the initial level of demand. However, the expected demand did not eventuate during implementation. In hindsight, the end targets for community service and microenterprise connections were too ambitious.

63. Reporting every quarter was quite demanding for the OBA team in SP. In consultation with the World Bank team, the frequency of reporting was reduced to every semester and the report was to be submitted within 45 days after the end of a semester. This helped SP in following the reporting schedule and reduced unnecessary burden and delays without compromising the reporting process. Throughout implementation, these M&E activities were timely fulfilled by the responsible parties.

64. **The level of subsidy for household connections remained within the desired range, especially for Honiara.** The OBA subsidy covered 72 percent of the cost of connections in Honiara and 79 percent in outstations. This was stipulated during the project conception based on the overall cost of connection and internal wiring in 2016. To ensure the OBA subsidy was covering the targeted percentage of the cost per household connection, the percentage of subsidy was monitored through each claim for subsidy. SP submitted the detailed costs and the average cost per household to the IVA with the claim for subsidy. The percentage of subsidy was generally constant in Honiara but increased in the outstations as a result of reductions in the cost of connections. Overall, the average cost per service connection was approximately US$994 in Honiara and US$1,257 in outstations. The overall installation cost per household throughout the project implementation period remained close to the anticipated average cost of US$1,125. There were some initial peaks, but the average cost stabilized later in the project period, which indicated better management and availability of more trained electricians.

M&E Utilization.

65. **The project management team at SP tracked monthly connection progress and produced semester reports which reported on progress toward indicators.** Through M&E it was identified access to valid land titles emerged as a major barrier which was holding low-income households to apply for subsidized OBA connection and stifling demand for the program. Many eligible households, especially in Honiara, were residing on the land owned by the government and did not have land titles and hence were not able to comply with SP's connection requirements. However, appropriate steps were taken by the Government, SP, and the World Bank to overcome this challenge. Following discussions between SP and the Ministry of Lands and Housing Survey, an arrangement was reached to provide support letters for potential applicants residing in perpetual estate land for them to obtain an electricity connection. As a result, this barrier to applying for a connection was resolved.

66. **In addition to M&E conducted to inform project implementation, the IVA gathered information from customers through a customer survey during physical verification.** The IVA took pictures of verified installations (for example, beneficiary family, house/building, switchboard, lighting points, service line conductor, poles, and meter) and conducted a short beneficiary survey. As a result of feedback gathered during physical verification, the internal wiring configuration was changed based on the customers' feedback and safety to improve electricity services and experience**.** The project team took customers' experience into account to deliver electricity services, and the decision to retrofit the original household wiring design was part of the midcourse correction. Retrofitting covered all households connected before August 13, 2018, who received the original house wiring configuration of 2 bulbs, 1 switch, and 1 power point. The retrofit works was carried out for 914 connections across Honiara, Seghe, Taro, and Auki with no additional cost to the households or project.

67. **The overall rating of quality of M&E is Satisfactory.**

Fiduciary Compliance

68. **Financial management.** A Financial Management (FM) assessment of SP was carried out in February 2016 and concluded SP satisfied the Bank's Operational Policy and Bank Policy 10.00 financial management minimum requirements. The semester IFRs were generally timely submitted to the World Bank along with the annual audited reports, which were included in the annual entity audit by the Solomon Islands' Auditor General, were unqualified.

69. **Procurement.** The OBA program was designed following the approach of 'output-based disbursement' or 'disbursement linked to indicators'. Procurement capacity assessment was carried out to confirm SP's procurement capacity under the project using 'output-based disbursement' procedures. The SP has existing framework agreements for the supply of materials and equipment in place with various suppliers which were established through an international competitive process. Licensed electrical contractor(s) were selected through public tender by SP and material was issued in batches by SP to the contractor based on the number of households to be connected in each batch and licensed electrical contractors were paid only for eligible connections delivered. One procurement – recruitment of an OBA Program Manager - was carried out using World Bank procurement regulations. Due to a lack of interest from suitably qualified candidate, SP made several attempts to recruit a PM. The position was first advertised in June 2016, subsequently in September 2016 and in early 2019. Notwithstanding the delays to complete the process, the procurement was carried out in accordance with the World Bank procurement regulations.

70. The overall rating of fiduciary compliance is **Satisfactory.**

Safeguards Compliance

71. **Safeguard arrangements.** Environmental Assessment (OP/BE4.01), Indigenous Peoples (OP/BP 4.10) and Involuntary Resettlement (OP/BP4.12) were triggered. An Environmental and Social Management Framework (ESMF) and a Resettlement Policy Framework (RPF) with mitigation measures were developed for the project and consulted with main stakeholders and potential beneficiaries. It is a requirement that the project be implemented in strict accordance with both the ESMF and the RPF. As part of each Project Report, a report on the results of monitoring the status of compliance with the ESMF and RPF activities during the period covered by the report, gave details of

- Measures taken in furtherance of the ESMF and RPF;
- Conditions, if any, that interfere or threaten to interfere with the smooth implementation of the ESMF and RPF; and
- Remedial measures taken or required to be taken to address such conditions.

72. SP continued to carry out monitoring of environmental and social risks associated with installation of new connections. Monitoring is documented on a one-page form, coordinated by the OBA PM and completed by the logistics and technical officer. In some instances, service lines to households were objected to as they affected fruit trees. In such cases, the reason for the line design was explained and the option was given to not connect the households. Lines were only installed with the consent of the applicant. Public consultation continued to be regularly carried out to inform residents of the program. The policies were implemented in accordance with the Bank standards.

73. Regarding associated generation facilities, the OBA program is now targeting Munda, where the ADB is funding a hybrid generation system. As an associated facility under World Bank safeguards policies, SP shared the initial Environmental Assessment that was prepared for the site. The World Bank reviewed the documents and gave ‘no objections.

74. Management of environmental and social risks on the project is rated **Satisfactory**.

BANK PERFORMANCE

75. **Quality at entry.** The World Bank identified, prepared, and appraised the operation in a manner that it was likely to achieve the planned development objective. The project objective of increasing energy access was relevant for the Solomon Island’s long-term goals, and the project approach proposed by the World Bank was embedded in the country context. The energy access is a challenge in the Solomon Islands, especially connection fees for low-income households, and hence the World Bank’s role in facilitating was timely and aligned with SP’s goal of doubling the numbers of electrified households. The indicators identified were mostly appropriate to inform on the project objectives’ achievements and were later broadened during the restructuring to capture inclusion of community services and microenterprises in Component 1. The technical design of the project was sound with a flexible approach. The limit and configuration of technical design and wiring were changed based on the feedback from the field and ensure safety of the household. Overall, implementation arrangements were satisfactory and aided in the enhanced institutional, project management, and technical capacity of the utility.

76. **Quality of supervision.** Supervision was underpinned by technically sound and experienced team members, and despite changes in task team leaders during the project cycle, the project benefited from individual expertise and experiences at different implementation phases. Supervision inputs included frequent missions every quarter as well as regular reporting of operations and threats to development outcomes. The

Aide Memoires and ISRs offered pertinent information on project progress. The restructuring was well thought out, and inclusion of community services and microenterprises made this project more holistic. However, the target in these two categories were ambitious and could have been more realistic. The fiduciary management was done effectively with proper oversight, and environmental and social risks identified were low and needed minimal involvement of the safeguard specialists.

77. **IVA process.** The IVA process was handled through the World Bank due to lack of capacity in MMERE. GPOBA management approved the IVA to be World Bank executed based on experience of similar arrangements in other countries. The IVA was hired as an STC responsible for a desktop review and physically verifying validity and quality of connections (30 percent of the total claims) of each claim and provided regular OVRs. A strong IVA process ensured that the deserving low-income households were benefiting from the OBA subsidies.

78. Overall, the World Bank performance was **Satisfactory.**

RISK TO DEVELOPMENT OUTCOME

79. There is no substantial risk to development outcome as SP has strong buy-in for the project and OBA modality. The SIG has established targets to achieve universal access and SP is dedicated to assist the SIG in achieving the targets. The inclusion of the OBA component in SIEAREEP shows willingness of the SIG to accelerate access agenda and associated development outcomes. However, in the near term, the impact of COVID-19 might slow down the progress of achieving the agenda due to challenges in supply chain and travel ban. The high cost of connections is a risk as it is not affordable without subsidies and can deter many households from accessing electricity connection.

V. LESSONS LEARNED AND RECOMMENDATIONS

80. The preparation and implementation of the project (SIEAEP) was timely and provided many relevant learning experiences for the World Bank and the borrower. These lessons will be valuable for any future implementation of other investment operations and electricity access projects and OBA schemes.

81. **Political will, trust building, and regional examples are key for the project's success.** This is even more relevant for small countries such as the Solomon Islands, where the World Bank's team had to work closely with the Government, utility (SP), and GPOBA. The political will of SP and its genuine support for the energy access agenda were key in adopting the OBA approach as it invested in the project beforehand and then filed subsidy claims. The utility also relied on and trusted the World Bank's technical expertise given that its experience was limited, and it was implementing a results-based energy access project for the first time. The presence of World Bank staff primarily focused on the energy access projects during the peak of implementation also proved helpful, especially regular in-person meetings and addressing of challenges without much time lag.

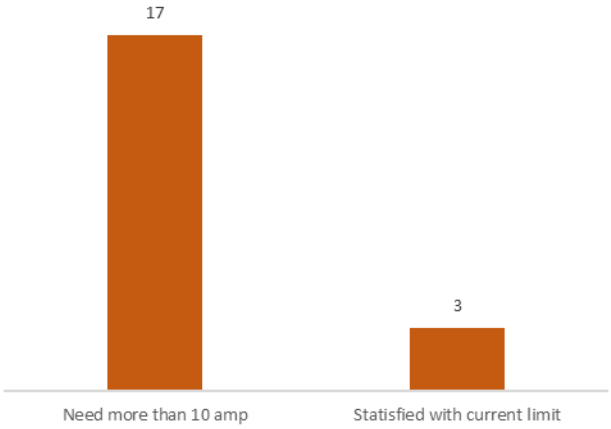
82. **Energy access projects are not just technical but embedded in the socioeconomic context and need flexible approach.** The SIEAEP shows that even after one had sorted out all the technical issues (wiring configuration, bulbs, poles, and so on), social challenges could affect overall outcome and impact. Even with all the right intention and technical design, land titles became one of the major impediments in Honiara for connecting low-income households. Given the sensitivity around land titles, the issue was handled pragmatically by all the stakeholders without creating any further conflict and their keenness to resolve this challenge was critical to the project success. The flexible and nimble approach adopted in the project allowed it to adapt to changes to improve implementation and meet beneficiaries needs. The changes such as 5

amperes to 10 ampere, wiring configuration, and addition of microenterprises and community services were incorporated in the project seamlessly. The flexibility rendered by the GPOBA team to allow these changes was also important.

83. **Energy access projects need time to take off.** The SIEAEP was approved in July 2016 and was due to close on June 30, 2018 but was substantially behind schedule by then. By early 2018, SP had only claimed payment for connecting 217 households out of targeted 2,565 households, corresponding to 8.5 percent of project funds. However, after addressing some of the challenges, the project started seeing uptake in connections with targeted awareness campaign. The project was eventually allowed a 21-month extension and with the help of the updated implementation plan and a dedicated OBA team, the project achieved 100 percent connection target (2,488/2,488) and 14,605 people were provided with access to electricity by the end of March 2020. The project was successful, and the component is further being implemented under the ongoing energy access project (SIEAREEP) while other donors are adopting the OBA approach in their energy access funding programs. The learnings from this project can provide lessons to other Pacific nations.

84. **Connecting enterprises and community facilities requires a different strategy and approach from that for the households.** Addition of enterprises and community facilities to the project was critical to reap full benefits of energy access, but targets were not achieved for these two categories. This shows that a different strategy and awareness campaign is needed to connect microenterprises and community facilities and clubbing them with the household's energy access approach does not work well. The enterprises and community facilities more often need higher connection capacity, awareness around appliance use (PRODUSE), training, and financial help. As per the beneficiary survey, 17 microenterprises responded that they needed more than 10 ampere connection to operate their activity (figure 14). Going forward, Component 2 of SIEAREEP would benefit from exploring this further and customizing its approach and awareness campaign to meet the needs of these microenterprises, as many of them did not have enough information on the number of appliances they could use on a 10 amp OBA connection. Many were also unaware that the OBA connection subsidy was available to microenterprises or community facilities as it was added midway in the project implementation cycle and the initial awareness campaigns were mainly focused on households. The energy access projects would also benefit from strategies around capacity-building and financial mechanisms as the up-front cost of certain appliances can be a barrier.

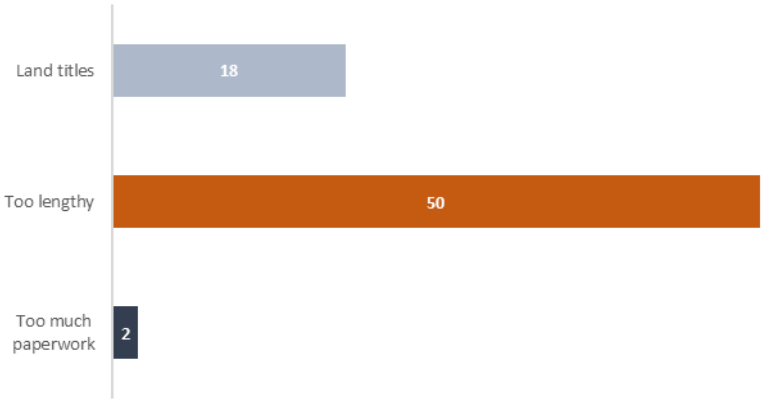
Figure 14. Desired Connection by Surveyed Microenterprises



85. **Better data management (availability and digitization) and coordination.** Lack of quality data is an inherent problem in many countries and is even more pronounced in small island nations such as the Solomon Islands. Creating baseline data and regular updates will immensely benefit the project (design, implementation, tangible outcomes, and so on) as well as create an asset for the country to report its energy

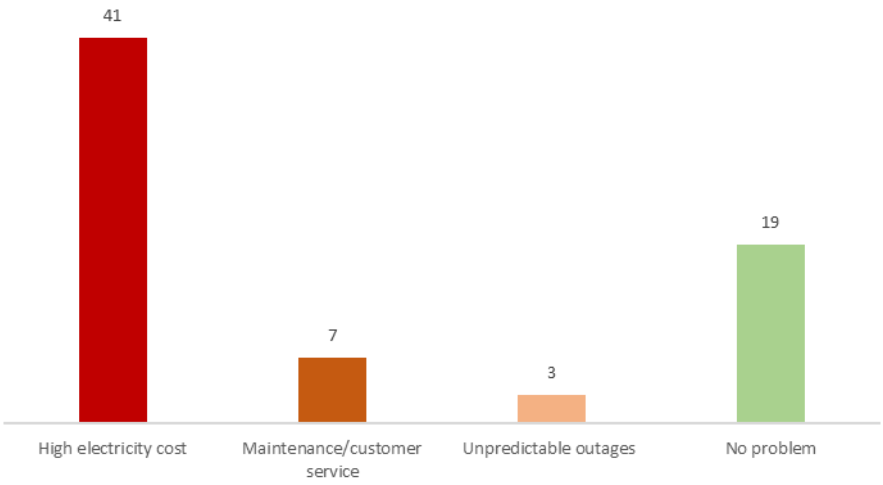
access gains under the Sustainable Development Goal (SDG) 7. Digitization and centralization of data can improve the efficiency and help with the coordination among different teams. For example, in the SIEAEP, various teams used different data sets (paper based) rather than a centralized digital system, which led to mismatch between applications and the transmission network. This also resulted in delays in application processing and connection energization. As per the beneficiary survey, 50 households (71 percent) complained that the process was too lengthy (figure 15). However, the coordination and information flows increased later in the project, but data and application digitization can improve project efficiency to a great extent. In the absence of the geographic information system (GIS), the OBA team is currently relying on Google Maps to estimate the distance of households from service lines. A GIS-based map with a grid network would be helpful in mapping areas with existing LV lines and soliciting applications from households in vicinity of these lines. Ground-truthing to understand access eligibility and land ownership can reduce technical difficulties (extending service lines) and community conflicts (some households do not want lines to go over their houses or land).

Figure 15. Challenges with the OBA Connection Process



86. **High cost of electricity can be a barrier to move households up the electricity ladder.** The electricity generation in the Solomon Islands is highly reliant on imported diesel (70 percent), and at US$0.82 per kW, electricity cost in the country is among the highest in the world, almost double the average for Pacific Island countries. Generation is heavily exposed to global fuel price fluctuations and shocks and this challenge became even more apparent during the times of COVID-19 due to difficulties in imports/export and travel restrictions. There are efforts to move generation away from fossil fuels and toward renewable sources (hydro/solar) under SIEAREEP by the World Bank and other donors, which could bring electricity prices down in the future. Despite no price increase announced by SP due to COVID-19, many microenterprises and households, including female-headed households, find the high cost of electricity a major challenge as per the beneficiary survey (figure 16). The high cost of electricity can potentially keep OBA-connected households from moving up the energy ladder and electricity-based economic opportunities, especially for low-income households in a country with high levels of poverty.

Figure 16. Challenges with the OBA Grid Connection



87. **Capacity building, training, and awareness campaigns are an integral part of energy access project.** Given the challenges faced by the utilities in Island nations in terms of technical and management capacity as well as access to human resources, it is critical to design a project with capacity-building and awareness campaign components for the utilities and beneficiaries:

a. **Capacity building of SP for efficient implementation.** As seen in the SIEAEP, much of the initial delay was due to lack of capacity to manage the OBA project. Despite many attempts, SP was not able to find an external candidate for the PM position and finally in 2018, it appointed an internal candidate. Lack of capacity and training also resulted in the delays between household connections and OBA claims by SP. The delays in claims were a consistent challenge for the project with some improvements toward the end. It would be important to learn more about these delays and critically look at the OBA claim process going forward to understand challenges and come up with relevant solutions.

b. **Capacity building of MMERE to implement verification process (IVA).** In this project, the IVA process was managed by the World Bank, which is not a norm. This was partly decided because of capacity challenges within MMERE, and the overall IVA process was well executed by the World Bank in this case. However, ensuring sustainability of future energy access projects would require capacity building of MMERE (technical and human resources) for it to implement the IVA process with proper checks and balances.

1. **Capacity building and targeted awareness campaigns for electricians and communities.** Lack of trained electricians, especially on outstations, was a challenge during the project implementation and measures were taken by SP to train electricians to increase the pool. Going forward, it would be helpful to incorporate a decentralized (Honiara and outstations) capacity-building program for electricians as part of the project. Also, the idea that the households with no experience of electricity use will know how to use it once they are connected is a misnomer. Often these households also need capacity building, handholding, and information on how to efficiently use electricity. This issue was raised by the head of the Customer Services Division in SP as many households were not aware of the types of appliances which could be used on a 10-ampere load and feared faulting the wiring or tripping the meter. Specific and locally appropriate community awareness events and information brochures can be a way to overcome this challenge..

ANNEX 1. RESULTS FRAMEWORK AND KEY OUTPUTS

A. RESULTS INDICATORS

A.1 PDO Indicators

Objective/Outcome: People provided with new or improved electricity service

Unlinked Indicators

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
People provided with new or improved electricity service	Number	0.00 05-Apr-2016	0.00 30-Jun-2018	15498.00 31-Mar-2020	14605.00 31-Mar-2020
People provided with new or improved electricity service - Female	Number	0.00 05-Apr-2016	7050.00 30-Jun-2018	7523.00 31-Mar-2020	7090.00 31-Mar-2020
People provided with access to electricity under the project by household connections (grid or off-grid).	Number	0.00 05-Apr-2016	0.00 30-Jun-2018	12770.00 31-Mar-2020	13697.00 31-Mar-2020
People provided with access	Number	0.00	0.00	8939.00	9650.00

to electricity under the project by household connections in Honiara		05-Apr-2016	30-Jun-2018	31-Mar-2020	31-Mar-2020
People provided with access to electricity under the project by household connections in outstations	Number	0.00 05-Apr-2016	0.00 30-Jun-2018	3831.00 31-Mar-2020	4047.00 31-Mar-2020
People provided with access to electricity through Community electricity connections under the project.	Number	0.00 14-Mar-2018	0.00 30-Jun-2018	2480.00 31-Mar-2020	820.00 21-Jan-2019
People provided with access to electricity through Community electricity connections in Honiara	Number	0.00 14-Mar-2018	0.00 30-Jun-2018	1736.00 31-Mar-2020	280.00 31-Mar-2020
People provided with access to electricity through Community electricity connections in outstations	Number	0.00 14-Mar-2018	0.00 30-Jun-2018	744.00 31-Mar-2020	540.00 31-Mar-2020
People provided with access to electricity through microenterprise electricity connections under the project	Number	0.00 14-Mar-2018	0.00 30-Jun-2018	248.00 31-Mar-2020	88.00 31-Mar-2020
People provided with access	Number	0.00	0.00	174.00	76.00

to electricity through microenterprise electricity connections in Honiara		14-Mar-2018	30-Jun-2018	31-Mar-2020	31-Mar-2020
People provided with access to electricity through microenterprise electricity connections in outstations	Number	0.00 14-Mar-2018	0.00 30-Jun-2018	74.00 31-Mar-2020	12.00 31-Mar-2020

Comments (achievements against targets):

A.2 Intermediate Results Indicators

Component: Component 1: OBA subsidies for new electricity service connections and basic in-house wiring for low-income households

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Number of LED bulbs distributed and installed	Number	0.00 05-Apr-2016	4250.00 30-Jun-2018	7111.00 31-Mar-2020	7110.00 31-Mar-2020

Comments (achievements against targets):
The number of LED bulbs distributed to households, community services and microenterprises was met.

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Community contribution	Amount(USD)	0.00	234500.00	220664.00	220815.00

(beneficiary contribution) to the total cost of the project		05-Apr-2016	30-Jun-2018	31-Mar-2020	31-Mar-2020

Comments (achievements against targets):
The end target for total customer contributions paid was exceeded.

B. ORGANIZATION OF THE ASSESSMENT OF THE PDO

Objective/Outcome: Increase access to electricity services in low-income areas of Solomon Islands.	
Outcome Indicators	1. People provided with new or improved electricity service 2. People provided with new or improved electricity service, female 3. People provided with access to electricity under the project by household connections 4. People provided with access to electricity through ommunity electricity connections 5. People provided with access to electricity through microenterprise electricity connections
Intermediate Results Indicators	1. LED bulbs distribution and installation 2. Community contribution to total cost of the project
Key Outputs by Component (linked to the achievement of the Objective/Outcome 1)	1. Improved access to electricity 2. Improved gender parity (focus on female-headed households and microenterprises) 3. Distribution of LED bulbs 4.

ANNEX 2. PROJECT COST BY COMPONENT

Components	Amount at Approval (US$, millions)	Actual at Project Closing (US$, millions)	Percentage of Approval
Component 1: OBA subsidies for new electricity connections and basic in-house wiring for low-income households, microenterprises, and community infrastructure	2.125	2.124	99.9
Component 2: Implementation support for project management	0.1	0.069	69.0
Total	**2.225**	**2.193**	**84.5**

ANNEX 3. RECIPIENT, CO-FINANCIER AND OTHER PARTNER/STAKEHOLDER COMMENTS

The Ministry of Mines, Energy and Rural Electrification (MMERE) appreciates:

1. The successful implementation of the OBA project for exceeding the targeted number of households connected.
2. The flexibility by the World Bank to change following recommendation from SIG and stakeholders to include community service infrastructure, family canteens etc., to be included as beneficiary to the project and for increasing household maximum 5Amp capacity to 10Amp. This change could have contributed to the increased in household application to get connected.
3. The complementary partnership between the project and Solomon Power (SP) to increase access of electricity to households in peri-urban areas (both for Honiara and provincial centers).

MMERE recommends:

1. To continue with OBA in future SP grid extension program and distributed mini-grid installations.
2. Explore possibility of applying OBA to rural electrification projects installed by MMERE and other SIG Ministries.

ANNEX 4. SUPPORTING DOCUMENTS

SIEAEP Beneficiary Survey Report
ICR-2020

A. Background and Context

1. Energy is vital to promoting economic growth, overcoming poverty, and buoying human development. Gaining energy access is a precondition to reaching many development goals. It is estimated that 70 percent of Pacific islander households do not have access to electricity, which is equivalent to access rates in Sub-Saharan Africa and slightly below the average for low-income countries. Pacific Small Island Developing States (SIDS) face unique challenges in expanding access to electricity, given that their populations are spread across tens of thousands of islands. Governments and development partners in Pacific SIDS continue to priorities development of electricity grids, as is evident in the ongoing subsidization of grid-based power consumption and the establishment of ambitious (grid-based) renewable energy targets (Dornan 2014)[17]. Energy poverty in the region is concentrated in three countries: Papua New Guinea, the Solomon Islands, and Vanuatu. These countries account for 84 percent of the population of all 14 independent SIDS in the Pacific and have very low levels of access to electricity. The electrification rate in all three countries is lower than that of other countries with similar levels of GDP per capita. The studies analyzing data from household surveys in Sub-Saharan Africa have found positive impacts of electrification on total income (Jimenez 2017)[18], agricultural productivity (Salmon and Tanguy 2016)[19], employment (Dinkelman 2011)[20], and education and health benefits for households (World Bank 2015). Sustainable energy has been identified as critical to ensuring access to affordable, reliable, sustainable, and modern energy for all; the aim is to achieve this SDG by 2030.

B. Beneficiary Survey

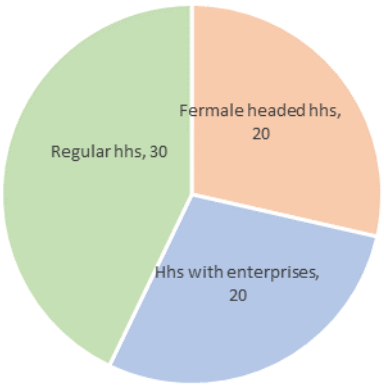
2. The challenge in these countries is also lack of baseline data on energy access based on which the progress toward these goals can be monitored. Hence, an anecdotal beneficiary survey was conducted as part of the SIEAEP ICR process. Due to COVID-19 and travel restrictions, the survey was not extensive and was focused mainly on Honiara and a few outstations. The survey's objective is to provide more nuanced data on energy access using the MTF-like approach which goes beyond the traditional binary measurement of energy access—for example, having or not having a connection to electricity—to capture the multidimensional nature of energy access and the vast range of technologies and sources that can provide energy access while accounting for the wide differences in user experience.

[17] Dornan, M., 2014, Access to Electricity in Small Island Developing States of the Pacific: Issues and Challenges, Renewable and Sustainable Energy Reviews, 31, 726-735]
[18] Jimenez, R. 2017. "Development Effects of Rural Electrification." IDB Policy Brief, InterAmerican Development Bank, Washington, DC
[19] Claire Salmon & Jeremy Tanguy, 2014. "***Rural Electrification and Household Labor Supply: Evidence from Nigeria***," *TEPP Working Paper* 2014-10, TEPP.
[20] Dinkelman, T. 2011. "The Effects of Rural Electrification on Employment: New Evidence from South Africa." American Economic Review 101 (7): 3078–108. http://www .aeaweb.org/articles.php?doi=10.1257/aer.101.7.3078.

C. Household Information

3. The survey focused on households with electricity access under the OBA scheme for one to two years. It has been seen that the benefits of electricity are more evident after a few years of being connected as households need time to understand and get used to electricity access. Overall, 70 households, including 20 female-headed households and 20 with some economic activities, were randomly selected and interviewed for the survey. The breakdown of household characteristics is provided in figure 4.1.

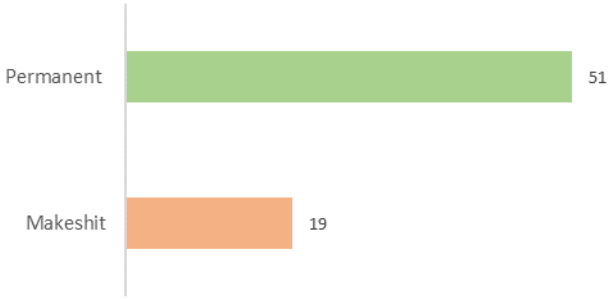
Figure 4a.1. Composition of Households Surveyed



Note: HHs = Households.

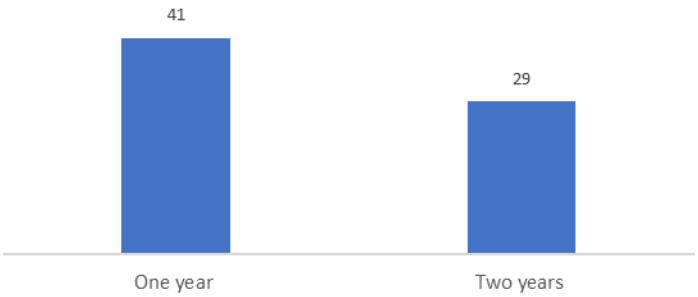
4. Given the poverty levels in the Solomon Islands and with the OBA's focus on connecting low-income households, all the houses surveyed did not have permanent structure and some of them were makeshift. However, proper safety precautions were taken to ensure safe and secure wiring in the makeshift houses as well (figure 4a.2).

Figure 4a.2. Types of Dwelling



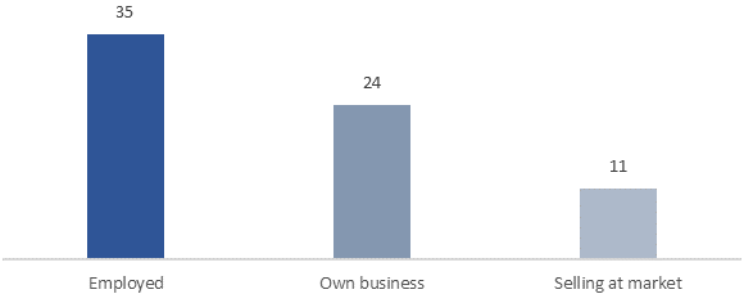
5. The OBA project was approved in 2016, but the connection rate improved only after the challenge around land titles for low-income households was resolved in 2018. The focus of this survey has been to understand the electrification impact from the beneficiary perspective and experience. The houses with at least one year of connection would have better understanding of electricity usage than newly connected houses. Figure 4a.3 shows the number of houses connected for one or two years under the OBA scheme.

Figure 4a.3. Number of Years Connected to the Grid under OBA



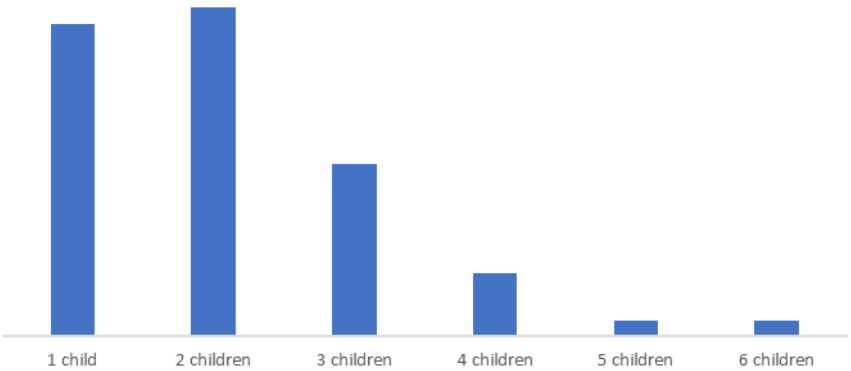
6. The electricity access is not only about getting OBA connection subsidies but also being able to pay monthly electricity bills, especially given that these are low-income families. Hence, the beneficiary survey also focused on the types of employment for the surveyed households. Majority of households are employed (35), some are small business owners (24), and the rest (11) sell at the local market (figure 4a.4).

Figure 4a.4. Employment Status



7. The benefit of electricity especially for education is well proven as it improves attendance at school, teachers are more willing to teach at school with electricity, and students get more time to do their homework in the nighttime. The survey shows that most of the children in these households attend school or college (figure 4a.5). This is also a sign of social and economic upward mobility as parents value education.

Figure 4a.5. Number of Children in School and College per Household



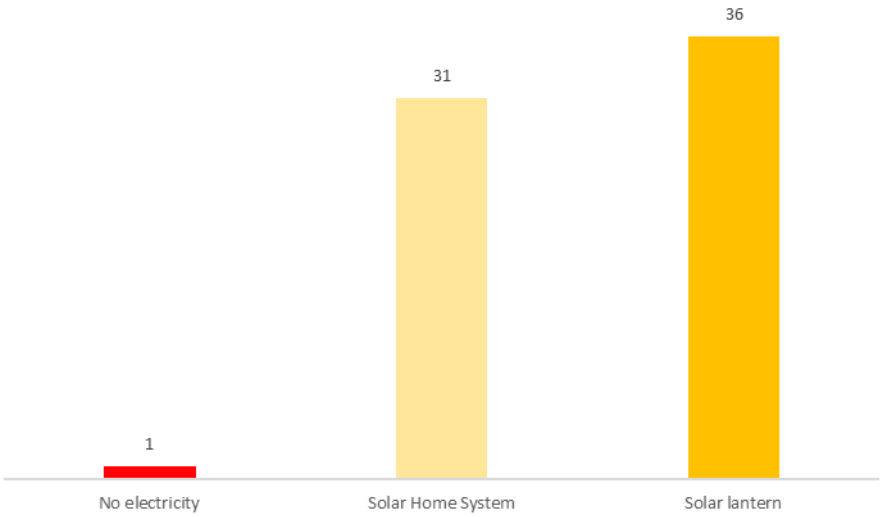
D. Impacts of OBA Connection

8. All costs for wiring for the regular household with kilowatt connection is charged to the customer by the licensed electrical contractor. The cost for installing the service line is assessed as per quotation provided by SP. There is no installation cost for meter, but a refundable security deposit of SBD6,000 for commercial and SBD3,000 for domestic installation applies. The installation cost for a regular connection is SBD800.

9. The high cost of connection is a barrier (approximately SBD 2,500 for connection + SBD 10,000 for in-house wiring, totaling approximately US$1,500) and cost of electricity per unit is US$0.85 per kWh for households which is second highest in the Pacific. The OBA subsidy for low-income households is the only lifeline through which these households can get connected and enjoy electricity access. Under OBA connection, there is no cost to the customer for the supply line, except where the supply line is longer than 80 m. The OBA customer pays US$200 for installation cost of meter whereas no deposit is required.

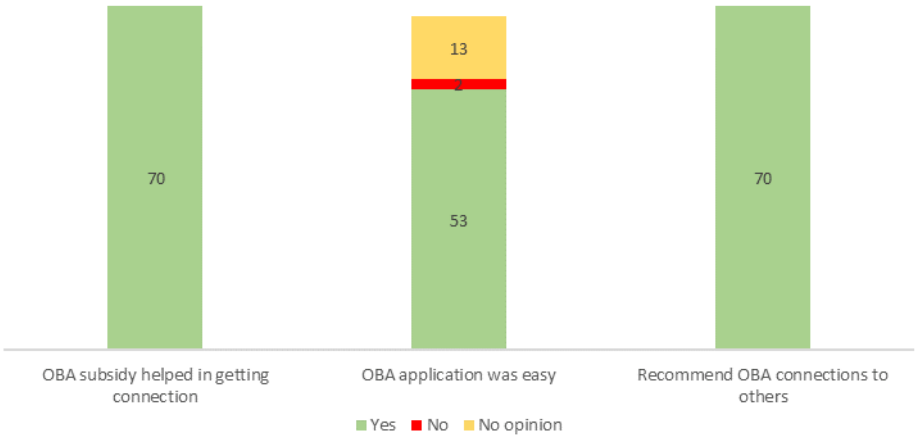
10. Most of the low-income households surveyed were using solar home systems (31) or just solar lanterns (36), which is not enough for some households (figure 4a.6).

Figure 4a.6. Sources of Electricity before OBA Connections



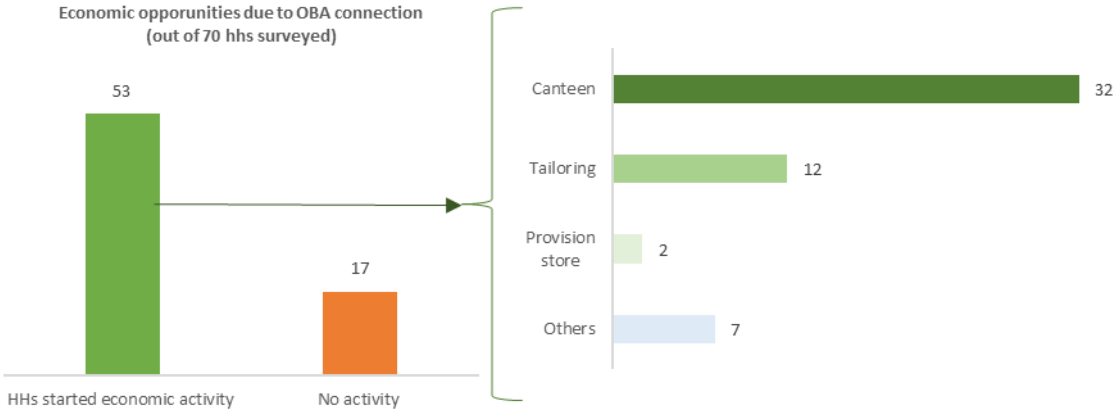
11. All the surveyed households (70) say that the OBA subsidy helped them get the electricity connection without which they would not have been able to access the electricity (figure 4a.7). The households also say they would highly recommend the OBA scheme to other households as well. This in itself is an awareness campaign where households highly satisfied with OBA connections are ready to share the information with other households.

Figure 4a.7. Impacts of OBA Connections



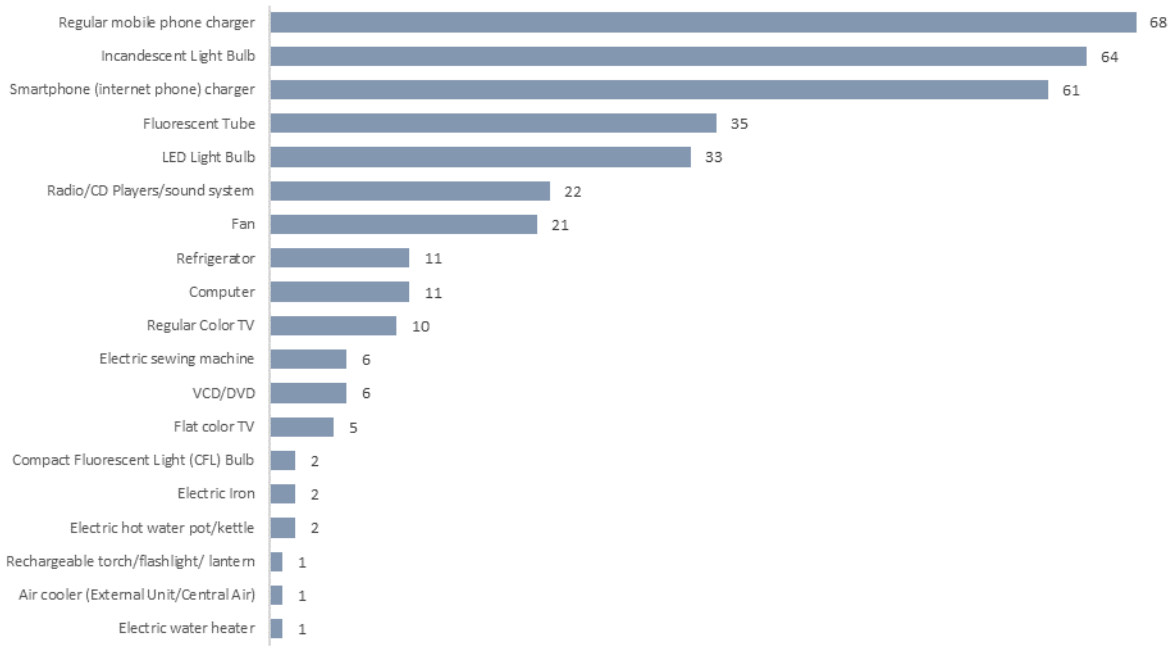
12. The OBA households have not only used electricity for regular purposes but many of have started economic activities after getting connected. As evident from figure 4a.8, 53 out of 70 households started some economic activities such as canteen (32), tailoring (12), provision store (2), and other activities (7).

Figure 4a.8. Types of Economic Activities



13. The pathways of electricity for development start with the purchase of appliances. After adopting electricity, households purchase a variety of appliances, starting with electric lights, followed by radios, television sets, computers, electric fans, space heaters, air conditioners, cooking appliances (for example, microwaves and rice cookers), and refrigerators. These appliances, in turn, lead to a host of immediate- and long-term outcomes. Future income might also increase for some households with home businesses that can be kept open for longer hours in the evening. However, rural and low-income households use only low-load appliances such as phone chargers, radios, and TVs (figure 4a.8). This is likely related to lower affordability levels in remote areas—either to pay the up-front costs of an appliance or to pay for higher electricity consumption due to the appliance use. In addition, some appliances may not be readily available in remote areas. Despite these financial barriers and remoteness in the Solomon Islands, the purchase and use of appliances in the OBA-connected households is impressive. Many of the appliances are not just for household use but also for economic activities.

Figure 4a.9. Appliance Use (OBA-connected households surveyed)



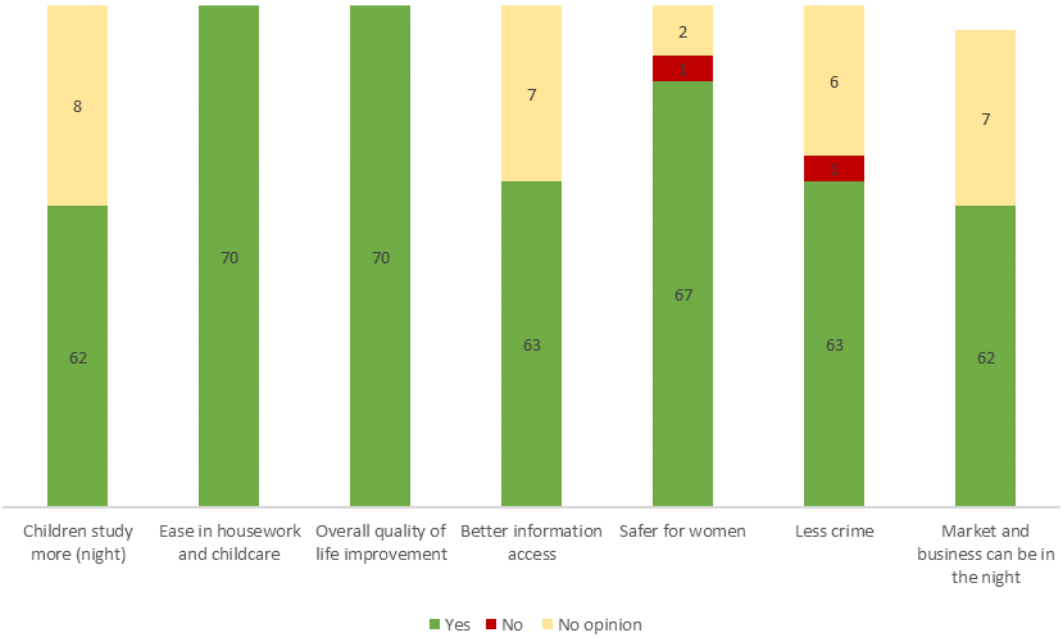
14. A wide range of studies confirm that the adoption of electricity results in a higher level of household lighting use. Nearly all households without electricity use kerosene lamps or candles for lighting, and the numbers add up. For example, the energy poor in Africa spend about US$17 billion a year on costly, inefficient kerosene-based lighting, which offers poor-quality light, poses fire hazards, and pollutes the indoor environment. Switching to higher-quality, more efficient electric lighting enables households to read and study during evening hours, increase productivity, and raise incomes and quality of life (O'Sullivan and Barnes 2007).[21]

15. The benefits of changes in energy access typically occur at the household or community level. These benefits include better education, cleaner cooking, and a higher quality of household lighting, among others. Benefits derived from electricity services include better opportunities for education, health, entertainment, comfort and convenience, productivity, and a less expensive means of lighting. The increased use of radio, TV, and computers means increased access to information, knowledge, and entertainment. Increased knowledge can lead to better income-earning opportunities and improved hygiene, implying better health for those in households with electricity. Increased knowledge can also lead to greater empowerment of women (Barnes and Samad 2018).[22]

16. The beneficiary survey also falls along similar lines when it comes to looking at perceived benefits of electricity access in OBA-connected households. Majority of households surveyed see improvement in quality of life, ease in housework and childcare, improved access to information and education, better opportunities for their businesses, and less crime due to electrification (figure 4a.10).

[21] Sources: Lighting Africa (https://www.lightingafrica.org/); Nieuwenhout, Van de Rijt, and Wiggelinkhuizen 1998; O'Sullivan and Barnes 2007.
[22] Barnes, Douglas F., and Hussain Samad. 2018. *Measuring the Benefits of Energy Access: A Handbook for Development Practitioners.*

Figure 4a.10. Benefits of Electricity Connection Perceived by Households



E. OBA Connection and Gender Impacts

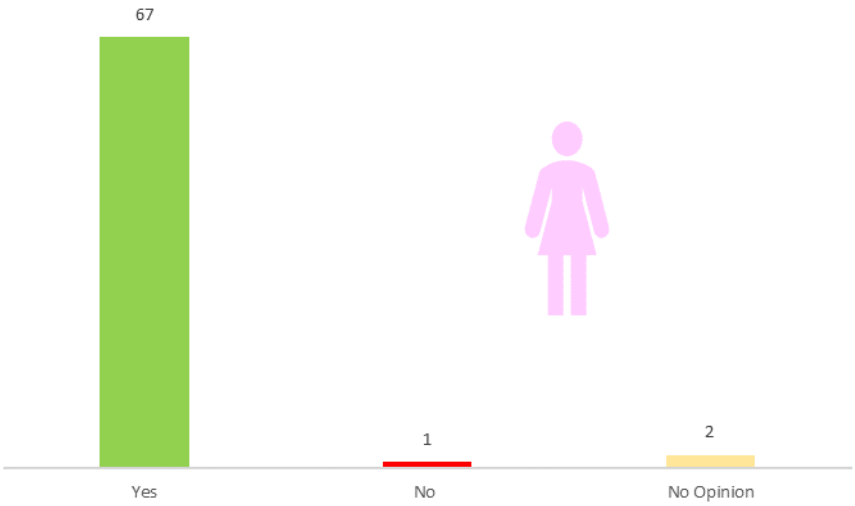
17. At the household level, information should be obtained from both male and female heads of households. Collecting gender-disaggregated data is important for the following reasons:

a. Empirical evidence shows that interviewing only male heads of households may not accurately represent all members of the household.

b. Men and women have different roles in society and the household, and thus, they are involved in different activities and have different needs and priorities.

18. Keeping the gender differences in mind, the survey focused on 20 female-headed households, but even at the broader level, most of the households (67) felt that the electricity access has contributed to women's safety in OBA-connected households and neighborhoods (figure 4a.11).

Figure 4a.11. Electricity Has Improved Women's Safety

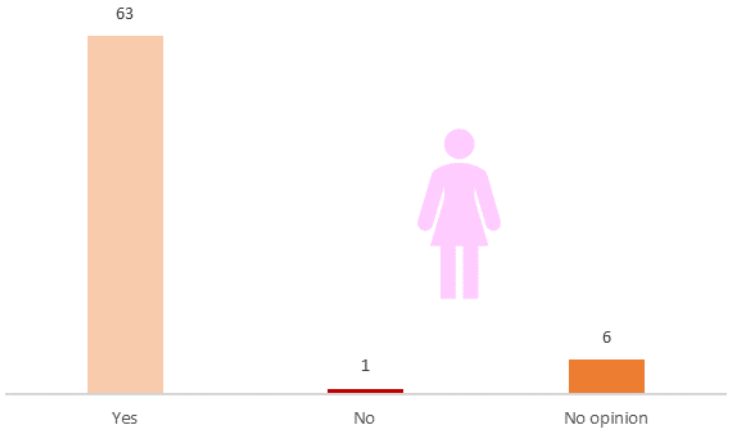


Note: Opinion shared by surveyed households.

19. Female-headed households are less likely to have access to energy than male-headed households. Specifically targeting female-headed households therefore means higher levels of energy access. In general, lighting and TV are the first common uses of electricity, and electrification has several important gender impacts, in addition to the reduction in time poverty. For example, electricity displaces candles and kerosene lamps, reducing indoor air pollution and fire and burn risk, and providing higher-quality light. This benefits women more than men, as women tend to spend more time at home. Lighting, radio, and television help improve access to information, increase the ability to study, and extend the effective working day. Lighting also improves the productivity of many household activities and has potential benefits for public safety and expanded income-generating opportunities.[23] As per figure 4a.12, majority of households share that the crime rates have gone down since they had electricity access, and this particular factor also contributes to the safety of women and girls. This is relevant both at the household and microenterprise levels, especially if they are headed by females. Majority of surveyed households (63) share the view that the crime rate has gone down since the OBA connection, and this particularly has impacts on women and girls as they can spend time outside without fear for their safety.

[23] https://www.esmap.org/sites/esmap.org/files/DocumentLibrary/Gender_Energy_M02.pdf

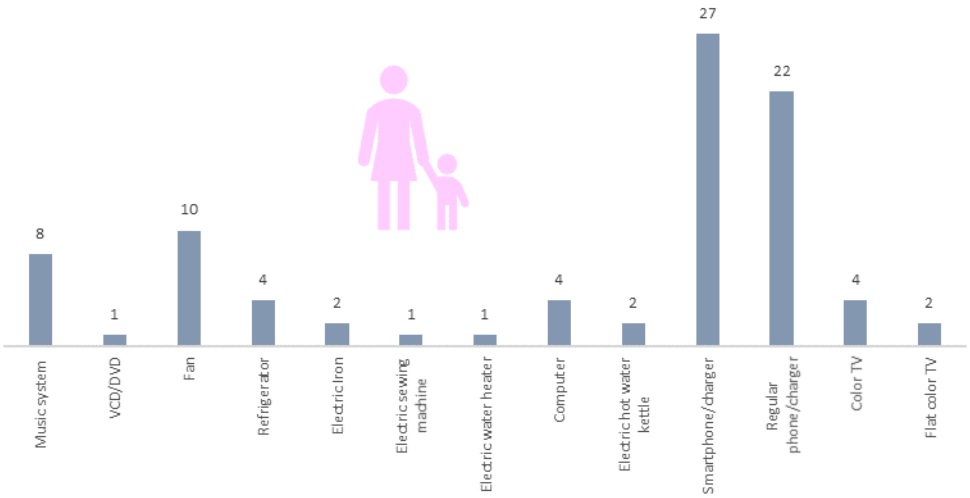
Figure 4a.12. Access to Electricity Has Led to Lesser Crime Rates



Note: Opinion shared by surveyed households.

20. Figure 4a.13 shows that the gender impacts of connecting female-headed households are not just limited to the safety and ease of daily chore, but it also has impacts on their economic well-being and access to information. Twenty female-headed households were surveyed as part of the beneficiary survey and they altogether bought 49 phones after connecting to the grid. Appliances such as fans (10), refrigerators (4), electric kettle (1), iron (2), and water heater (1) eased their daily burden and computers (4) and sewing machines (1) added to their income generation.

Figure 4a.13. Appliances Bought by Female-headed Households



F. OBA Connections and Quality of Electricity

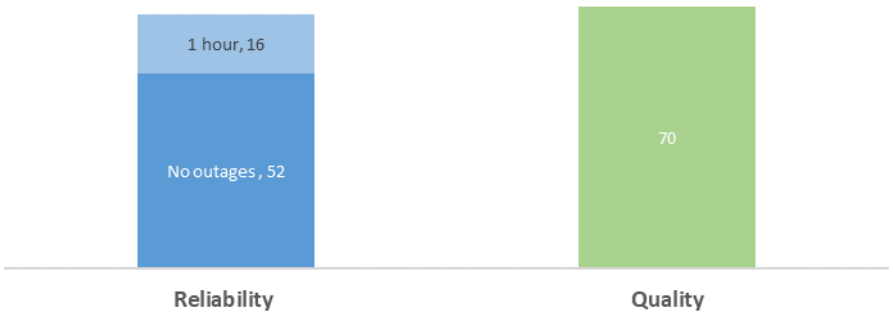
21. As discussed earlier, the survey was designed based on an MTF-like approach which focusses on more nuanced understanding of electricity access as opposed to the binary approach. The focus in the MTF approach is to see access through the spectrum of seven attributes, but all of these were not used in the survey. The intention was to dig deeper into the quality of electricity once the OBA connection was made. The survey questionnaire explores two attributes which are important to enjoy full benefits of access.

- **Reliability** ("Is my service frequently interrupted?"). The reliability of electricity supply is a combination of the frequency and the duration of unexpected disruptions.

- **Quality** ("Will voltage fluctuations damage my appliances?"). The quality of the electricity supply refers to the absence of severe voltage fluctuations that can damage a household's appliances.

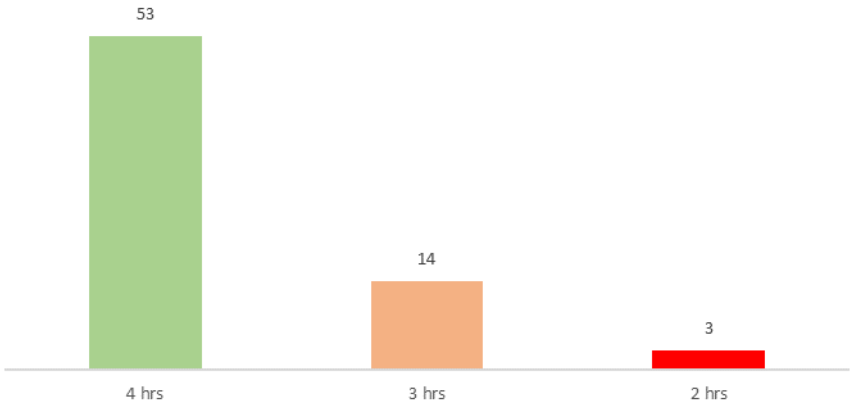
22. Most of the households (52) were very satisfied with the reliability of electricity and did not experience any outages since connected to the grid. However, 16 households registered one-hour outage per week. And all the surveyed household were very satisfied with the quality of electricity and did not experience any voltage fluctuation or appliance damage (figure 4a.14). This shows that once they are connected to the grid through an OBA connection, majority of the low-income households enjoy reliable and quality electricity access. This also reflects SP's overall services quality, transmission network, and management.

Figure 4a.14. Grid Service for OBA-connected Households (only for surveyed households)



23. **Availabilit**y ("Is power available when I need it?"). The availability of supply refers to the amount of time electricity is available. It is measured through two indicators: the total number of hours per day (24-hour period) and the number of evening hours (the 4 hours after sunset) electricity is available. For households, the availability is most critical in the evening times for lighting, cooking, watching TV, or children doing their homework.

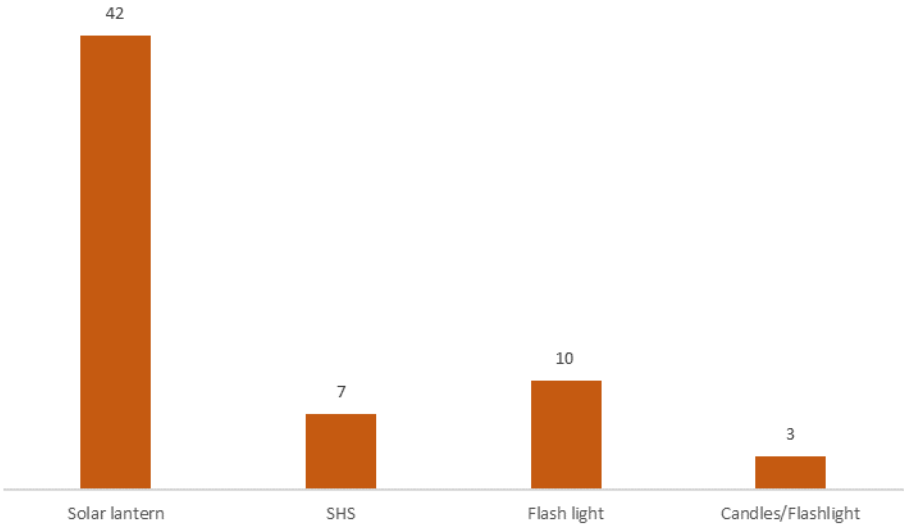
Figure 4a.15. Availability of Electricity between 6 p.m. and 10 p.m.



24. Most of the OBA households (53) get all 4 hours of electricity between 6 p.m. and 10 p.m. and only 17 households get less than 4 hours (figure 4a.15)

25. To cope with outages, many OBA households rely on solar lanterns and not a single household uses a kerosene lamp which is polluting, expensive, and unsafe. Other households rely on solar home systems, flashlights, and candles (figure 4a.16).

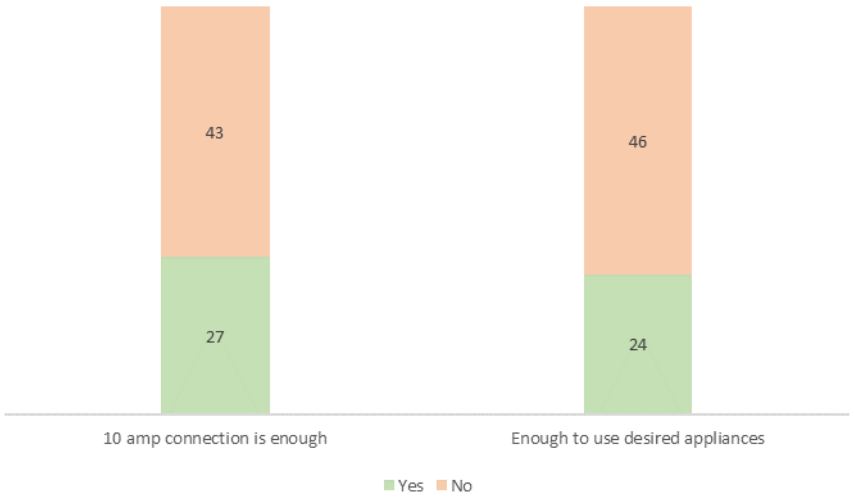
Figure 4a.16. Backup Sources Used during Outages



G. OBA Connection Process

26. The primary objective of the OBA program was to provide subsidies for new electricity connections, especially to low-income households, community facilities, and microenterprises in Honiara (capital city) and outstations (island provinces). However, it was agreed to follow the established process and procedures within SP to apply for OBA connections. Earlier during the project conception, it was decided to increase the connection capacity from 5 amp to 10 amp and include most of the low-income households, microenterprises, and community facilities. The survey tried to assess the connection capacity.

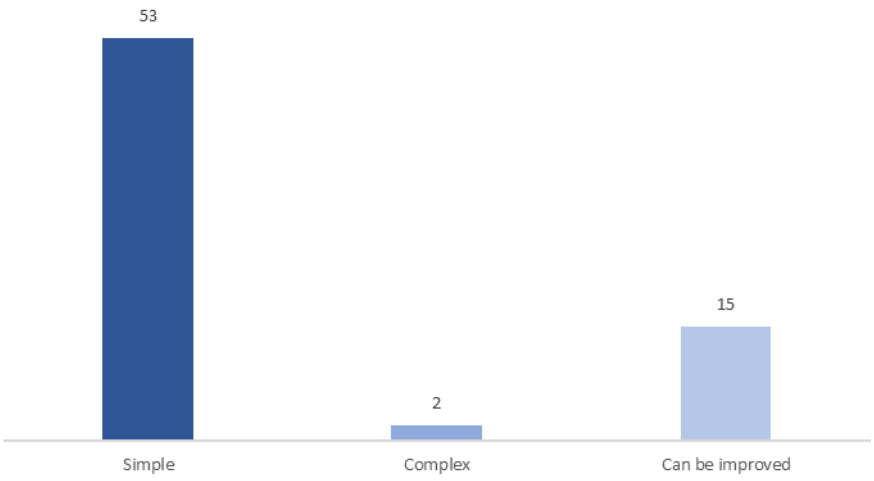
Figure 4a.17. Satisfaction Level with OBA 10-ampere Connection



27. The 10 amp limit was not enough for households, especially those connected for one to two years. Almost 43 households felt that the connection limit was not enough, and they would need an increase in the limit. This was also reflected when households were asked about whether they were able to use desired appliances (figure 4a.17). One of the reasons could be lack of awareness on the capacity limits and what appliances can be powered within this 10 amp limit or some households have moved up the energy ladder and need more power. This can be limiting for households who are planning or already have electricity-based economic activities.

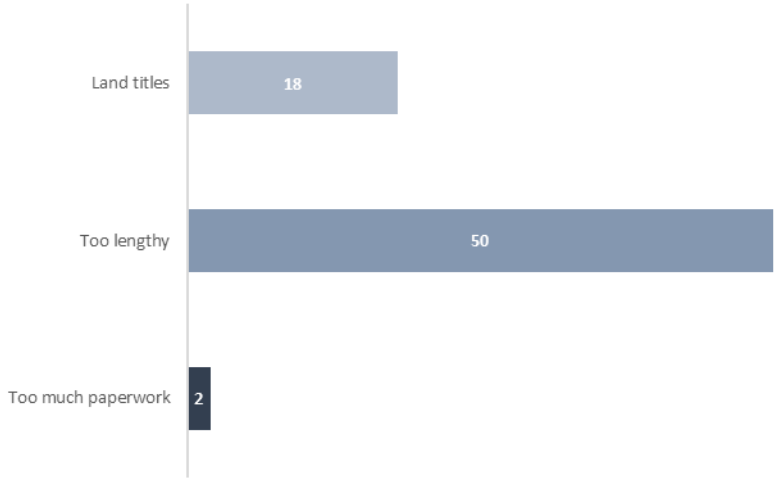
28. Majority of the households found the application process to be simple enough to get the connection while 17 households found it to be complex with room for improvement (figure 4a.18).

Figure 4a.18. Opinion about the OBA Application Process



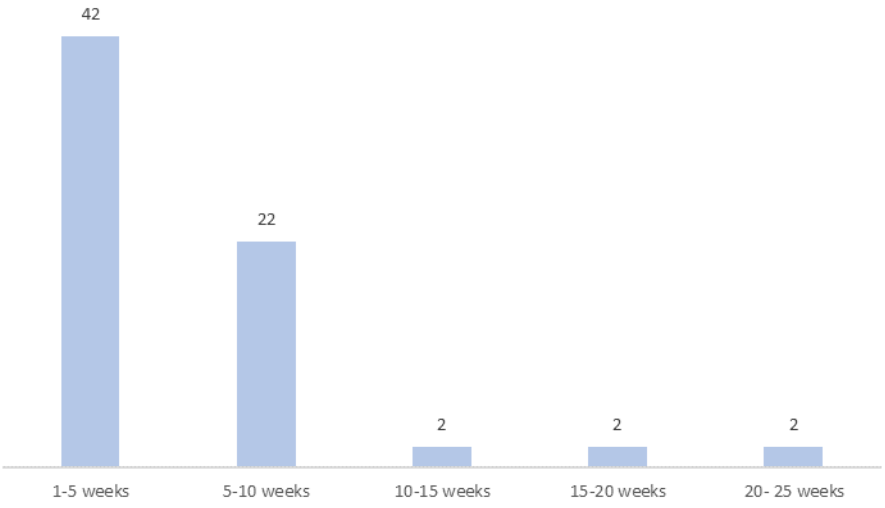
29. Most of the households expressed that the OBA connection process was too lengthy when asked about the challenges with the process. The second most challenging issue was land titles. It must be kept in mind that the households surveyed were early connectors and the land title issue was partially resolved in 2018 and may be some low-income households still perceive lack of land titles as one of the barriers. The length of the process can be a challenge as even though most of the application process is not paper based, there is no digitization or central data (figure 4a.19). This aspect of the process can be further improved and made more efficient.

Figure 4a.19. Challenges with the OBA Connection Process



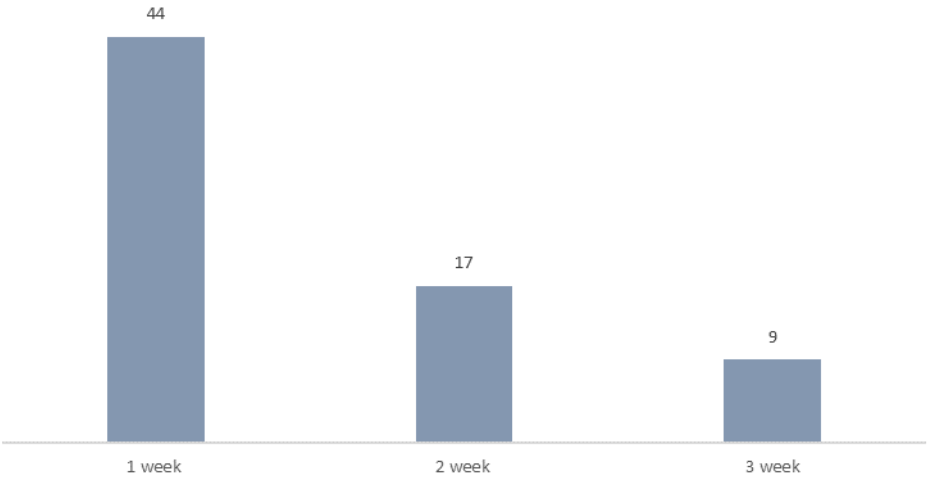
30. It seems that most of the households get their application processed within one or two months and others had to wait for more than three months (figure 4a.20). This might be due to lack of coordination between different departments or lack of a dedicated OBA team in the beginning of the project. This can be further investigated, and the OBA connection process can be further streamlined, especially based on beneficiary feedback.

Figure 4a.20. Time to Get OBA Connection (Application to internal wiring)



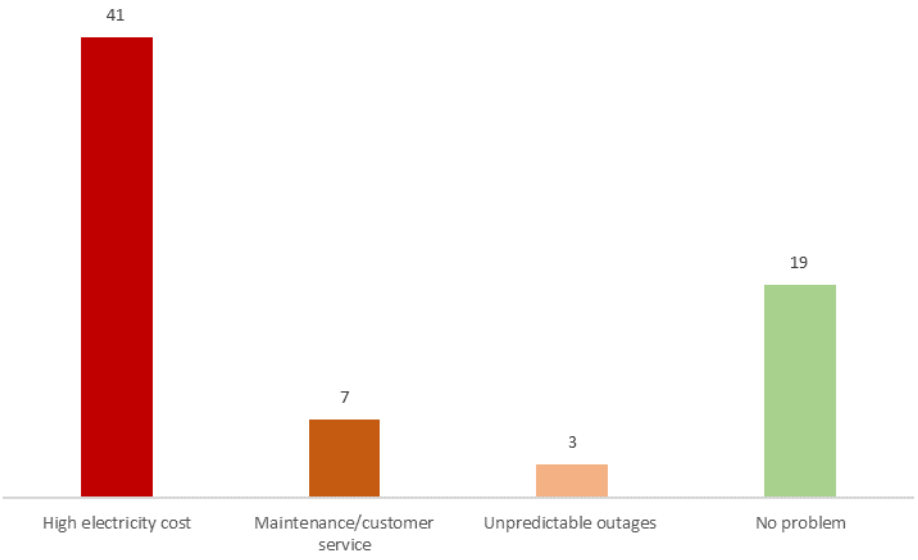
31. Despite challenges with the application process, the energization time of connection is impressive. Most of the households (44) got energized one week after the internal wiring was completed and for the rest it took two to three weeks.

Figure 4a.21. Time for Connection Energization (Internal wiring to current flow)



32. When asked about the major challenges once they were connected to the grid through OBA connection, majority of the households (41) identified the 'high cost of electricity' as one of the main problems. It is true that the cost of electricity in the Solomon Islands is second highest in the Pacific region. The reasons are many as the generation capacity is mostly reliant on imported diesel and the cost of generation is inherently high in island nations.

Figure 4a.22. Challenges with the OBA Grid Connection



H. Conclusion

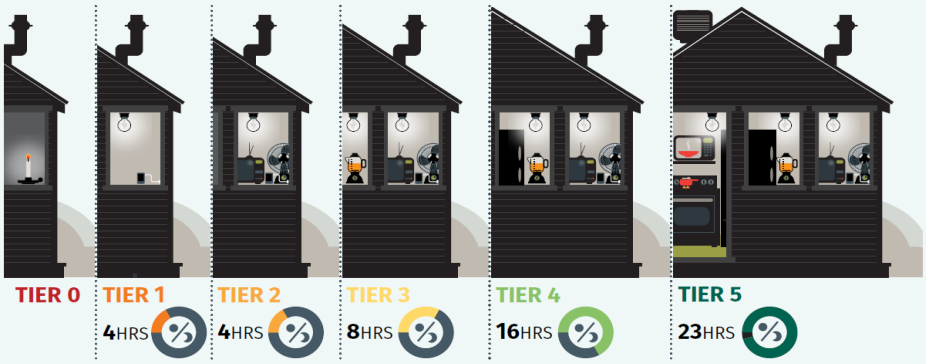
33. The beneficiary which is part of the ICR process is not representative of all the OBA households. It is merely anecdotal to understand the benefits of electricity access and challenges with the general OBA process from the beneficiary perspective. This provides only an overview rather than in-depth analysis and can be used for the ongoing SIEAREEP to dig deeper into the issue of interest

Annex IV B

MTF Attributes and Tiers

Box 4b.1. Minimum Electricity Requirements, by Tier of Electricity Access

BOX 2 • MINIMUM ELECTRICITY REQUIREMENTS, BY TIER OF ELECTRICITY ACCESS



Tier 0	Tier 1	Tier 2
Electricity is not available or is available for less than 4 hours per day (or less than 1 hour per evening). Households cope with the situation by using candles, kerosene lamps, or dry-cell-battery-powered devices (flashlight or radio).	At least 4 hours of electricity per day is available (including at least 1 hour per evening), and capacity is sufficient to power task lighting and phone charging or a radio (see table 1). Sources that can be used to meet these requirements include a Solar Lighting System (SLS), a Solar Home System (SHS), a mini-grid (a small-scale and isolated distribution network that provides electricity to local communities or a group of households), or the national grid.	At least 4 hours of electricity per day is available (including at least 2 hours per evening), and capacity is sufficient to power low-load appliances—such as multiple lights, a television, or a fan (see table 1)—as needed during that time. Sources that can be used to meet these requirements include rechargeable batteries, an SHS, a mini-grid, or the national grid.

Tier 3	Tier 4	Tier 5
At least 8 hours of electricity per day is available (including at least 3 hours per evening), and capacity is sufficient to power medium-load appliances—such as a refrigerator, freezer, food processor, water pump, rice cooker, or air cooler (see table 1)—as needed during that time. In addition, the household can afford a basic consumption package of 365 kWh per year. Sources that can be used to meet these requirements include an SHS, a generator, a mini-grid, or the national grid.	At least 16 hours of electricity per day is available (including 4 hours per evening), and capacity is sufficient to power high-load appliances—such as a washing machine, iron, hair dryer, toaster, and microwave (see table 1)—as needed during that time. There are no frequent or long unscheduled interruptions, and the supply is safe. The grid connection is legal, and there are no voltage issues. Sources that can be used to meet these requirements include diesel-based mini-grids or the national grid.	At least 23 hours of electricity per day is available (including 4 hours per evening), and capacity is sufficient to power very high–load appliances—such as an air conditioner, space heater, vacuum cleaner, or electric cooker (see table 1)—as needed during that time. The most likely source for meeting these requirements is mini-grid or the national grid.

Source: World Bank, 2015

Table 4b.2. Appliances by Load Level and Associated Capacity Tiers

Load level	Indicative electric appliances	Capacity tier typically needed to power the load
Very low load (3–49 W)	Incandescent light bulb, fluorescent tube, compact fluorescent light (CFL) bulb, LED light bulb, Torch/ flashlight/lantern, Radio/CD Players/sound system, Smartphone (internet phone) charger, Regular mobile phone charger	TIER 1
Low load (50–199 W)	Television B/W, computer, fan, flat color TV, regular color TV, VCD/DVD	TIER 2
Medium load (200–799 W)	Indoor air cooler, refrigerator, electric water pump, electric food processor/blender, rice cooker, freezer, electric sewing machine, electric hot water pot/kettle	TIER 3
High load (800–1,999 W)	Washing machine, electric iron, microwave oven, hair dryer	TIER 4
Very high load (2,000 W or more)	Air conditioner (AC), space heater, electric water heater, solar based water heater	TIER 5

Source: Bhatia and Angelou, 2015