EU-GIZ ACSE Project Final Report

Project: Solar Hybrid Systems in Boarding Schools, Kiribati (KI8)

Grant Agreement: 81202071

Budget - €475,400 (EU-GIZ component only)

Reporting Period 01 July 2016 – 31 August 2020

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Introduction

This report is the final report (referred to as Annex 7 technical report in the Financing Agreement) for the project ***Solar Hybrid Systems in Boarding Schools, Kiribati (KI8): Grant Agreement: 81202071*** funded by the European Union (EU) under the EU-GIZ Adapting to Climate Change and Sustainable Energy (ACSE) Programme.

The project is implemented by the Pacific Community (SPC) on behalf of, and in partnership with the Government of Kiribati (GoK). This report covers the entire project period from 01 July 2016 to 31 August 2020.

The report is structured to align to the GIZ "Capacity Works" Development Model and its five Success Factors for capacity development. These Success Factors as applied under EU-GIZ ACSE are:

- **Strategy:** Summary of project context, objectives, planned activities and outcomes – As embodied in the Project Design Document (PDDs); *(where applicable: Results model; Capacity Development strategy; major variations)*
- **Cooperation systems:** Key, primary and secondary actors.
- **Steering:** Stakeholder participation in implementing and steering the project; attaining project results based on operational planning and monitoring.
- **Processes:** Results and their validation; and,
- **Learning and Innovation:** Evaluations, knowledge attainment, distillation and sharing of knowledge at programme and project level and visibility.

1.0 Strategy

Please find below a list of the official start up documents related to this project.

Table 1: Summary of project start up and management documents

Annex	Title
	141003 KI8 - Concept Note Evaluation
	150519 KI8 - Concept Note Final
	151007 Kiribati MOU - GIZ - GOK A
	151007 Kiribati MOU - GIZ - GOK B
	151007 Kiribati MOU - GIZ_GOK for ACSE
	160510 KI8 - Project Design Document
	160712 KI8 - Financing Agreement - 81202071 - English
	160712 KI8 - Financing Agreement - 81202071 - German
	160712 KI8 - Special Agreement to FA - 81202071 - English
	170117 KI8 Kiribati MOA SPC_GOK for ACSE
	190819 KI8 - Project Variation 1 - Justification Letter
	190819 KI8 - Project Variation 1 - Proposal
	191108 KI8 – FA – 81202071 – Amendment 2
	200214 KI8 – FA – 81202071 – Amendment 3
	200828 KI8 FA 81202071- Amendment 4

1.1 Project Background, Objective and Outcomes

1.1.1 Background

Kiribati is highly dependent on imported fossil fuels for power generation and transportation energy used. To enhance the economic and productive growth in the schools and across the country, the GoK favoured the installation of the solar photovoltaic (PV) hybrid system to improve the provision of reliable electricity and to improve the quality and standard of education in the rural areas.

There are currently 8 ongoing installations of PV solar hybrid systems in the outer islands at boarding schools, which were funded by EDF10. However, there are two boarding schools that are without such systems, the Alfred Sadd Memorial College (ASMC) on Abemama Island in the Gilbert Group and the Meleangi Tabai Secondary School (MTSS), government school built in 1993 located on Fanning/Tabuaeran Island in the Line group.

ASMC is managed by the KUC (Kiribati Uniting Church) built in 1995 as a vocational school and in 2014, registered as a secondary school. In 2015, the school has a total of 138 people: 63 students (54 boys and 9 girls) and 75 people (staffs and families). The school has a Yanmar 7kW diesel generator generate power that provides electricity within the school compound.

The gen-set operated from 6.30pm – 9.30pm in the nights and sometimes during the days when is required by the school. All buildings include 18 local houses for staff, dormitories, classrooms, meeting hall, (used as dining hall and church) kitchen and staff rooms are connected to the electric power distribution grid network. The diesel fuel used for power generation is regularly purchased from KOIL agent on the island.

MTSS caters for students from the Line and Phoenix Group of islands. In March 2017, there were 170 students (122 girls and 48 boys) and 101 people (staffs and families) on the school community. All students are boarding students, so school provides for food, water and other essential basic needs for the students. The school has a Whisperwatt 15kW diesel generator that operates daily from 7.30pm to 9.30pm and from 10am to 2pm on Tuesdays and Thursdays. In times of fuel shortages gen-set running hours is reduced to save fuels.

The school gen-set consistently consumes 20 litres of diesel per 3 days when it is used only at night and 20 litres per day when extra 4 hours use on Tuesdays and Thursdays. The average fuel used is around 600 litres (3 drums of 200 litres) every month.

The ‘limited access to electricity’ in both schools emanated by the unreliability of fuel supply to the islands as well as the high costs of diesel fuels is a constraint to the school budgets. Electricity access to both MTSS and ASMC is limited to 3 hours a day due to the rationing of diesel fuels and at the same time limit the workloads of the gen-set as there is no standby gen-set for replacement.

The targeted secondary schools, MTSS in the Line group, and ASMC on Abemama have been relying on the diesel generators to generate electricity in the school communities since their establishment. One of the diesel generators at the ASMC School has exceeded its life service and not efficiently operated. Frequent technical maintenance services that costs time and money required to ensure that the gen-set operates especially in the nights.

Further, MTSS was the only public boarding school in Kiribati (as far as we are aware) without pumped water servicing the school's core facilities (drinking water, hand washing, cleaning, etc). Water is currently bucketed to the sites where it is needed. GoK has provided solar water pumping systems to most other public-owned boarding schools, apart from this one, due to its remoteness. Private-run boarding schools have all installed similar systems (as far as we are aware).

A simple water pumping system, or rainwater harvesting could have been integrated into the solar PV system proposed for the school to enhance water provision at key locations for core services such as drinking, sanitation and food preparation.

However, when MTSS closed, and the project relocated to JSS schools and councils, the project selected instead to focus on rainwater harvesting infrastructure rather than groundwater pumping. The project team discovered, in the course of its research, that Tabuaeran and Teraina islands had not had their water resources mapped, and that this exercise was very expensive. On this basis, the project team decided that ground water pumping, without this information, would have been high risk and that rainwater harvesting would be a safer option.

1.2 Objective

To establish solar-hybrid energy systems in two rural boarding schools, each sustainably operated and effectively meeting the current and predicted future needs of the school communities and helping achieve the Government's national renewable energy target for rural and private communities.

1.3 Outcomes

The planned outcomes for the project were:

1. Two solar-hybrid energy systems installed, one in each targeted boarding school.
   (Later changed to 4 solar PV systems installed at select schools and island councils).
2. Technicians trained in installation and maintenance techniques.
3. Governance arrangements for each system strengthened; and,
4. Skills of school communities in efficient renewable energy use enhanced.

1.4 Variations

Table 2 below lists the relevant documents used for changes occurred to the financing agreement.

Table 2: Summary of project variation documents

190819 KI8 - Project Variation 1 - Justification Letter
190819 KI8 - Project Variation 1 - Proposal
191108 KI8 - FA 81202071 - Addendum 2
200214 KI8 – FA 81202071 - Addendum 3
200828 KI8 – Financing Agreement Amendment 4

The variations to the project made are listed below.

1. The 1st contract amendment extended the project timeline ending date from 31 January 2018 to 31 January 2019 as this was due to the closure of the targeted site MTSS and the slow approval of its replacement.
2. The 2nd contract amendment with no-cost extension requested for extension timeline from 31.01.19 to 30.01.2020. This was caused by the closure of the MTSS in 2018, causing delays in implementation due to the late decision to select the new sites.
    - Change in target schools – ASMC remained a target boarding school in the project, and in 2018 the project team installed and commissioned a 20-kW system at the school. However, after the project had completed extensive surveys of MTSS in 2017-2018, the project's second target school, the government decided to close this school.
    - At the government's recommendation, the project then investigated St Leo's Secondary Boarding School on Butaritari island, as an alternative target school. As a new boarding school, still being established, and not yet registered, and underdeveloped, the school was not selected. Instead, after approval by cabinet, the project moved to the following target sites:
    - Taimanin Junior Secondary School (JSS) and associated Sunlight Primary School on Teraina Island, (Line Island Group) – which received a 5.5 kW solar system, shared by the two schools.
    - Teraina Island Council – which received a 5.5 kW solar system, used to service all local and national government ministry offices at the council premises, as well as the health center, police post and council-run guest house.
    - Tabuaeran Island Council - which received an 11-kW system, used to service all local and national government ministry offices at the council premises, as well as the neighbouring Keina Tiito JSS.
3. The 3rd contract amendment requested to extend the project timeline from 30 January 2020 to 31 May 2020 due to late completion of installations due to late arrival of batteries at the targeted sites.
4. The 4th contract requested no cost extension 31 May 2020 to 30 September 2020 to fully complete the technical reports, financial reports and auditing. The project has completed the installations and commissioning of the solar energy systems in the Teraina and Tabuaeran Islands in the Line and Phoenix Group of Islands.

1.5 Intended Outputs / Deliverables

Table 3: Description of projects outcomes and outputs

The projects deliverables, as planned, and achieved are tabulated below:

	Deliverable	Descriptor
Outcome 1	**2 * Solar Hybrid Energy Systems and 1 * Solar Water Pumping System installed**	Two Solar-Hybrid systems installed, each one sustainably operated and effectively meeting the current and predicted future needs of the respective boarding school communities. One water pumping system supporting the core service requirements at the MTSS boarding school on Fanning (Tabuaeran) Island. This was then modified to:

		4 solar systems installed at select schools and island councils, each one sustainably operated and effectively meeting the current and predicted future needs of the respective school communities. Additional water infrastructure provided to schools, where budget allowed.
Output 1	**3 * System Designs completed**	4 solar systems designed
Output 2	**3 * System Procurements and Installations complete**	4 solar systems procured and installed
Output 3	**6 * Trainings held**	Solar maintenance officers trained, and school communities educated in Renewable Energy (Solar energy) and Energy Efficiency conservation and management practices. Refer to 191105 – KI8 – Project Trainings Report.
Output 4	**2 * Governance Systems in place, one in each school**	Operations and maintenance plans for energy and water systems produced with, and adopted by, both schools and under agreement with the GOK. Letter of Agreement between the energy service providers and users developed to guide the governance of the solar systems. The installations of kwh meters and gapping the energy usage are additional governance measures.
Output 5	**1 * Project Monitoring and Evaluation system implemented**	Project monitoring and evaluation system conducted. Refer to Output Reports; (i) ASMC Technical and social Evaluation of the Solar PV Hybrid System Report, and (ii) Teraina and Tabuaeran Solar system impacts

1.6 Capacity Development Strategy

1.6.1 Alfred Sadd Memorial College

Table 4: Alfred Sadd Memorial College Capacity Development Strategy

Phase	Individuals	Organisations	Society	National level
	Competence development	**Organisational development**	**Development of cooperation systems**	**Development of enabling frameworks**
SWOT in the area of social concern	A. Maintenance or Power Technicians/Officers Qualifications	A. School Management – School Development Committee is appointed as the Governance Working Group for the Solar PV-Diesel Hybrid System and the current members are the Vice Principal, Account Clerk, Power Technician, Chairman of the ASMC School Council and ex official member is the Principal – who attends when required	The school had a Committee that oversee the welfare of households. The name of committee was "Te NibanAkoi" meaning "heart of kindness". The committee is comprised of the Chairperson, Treasurer and Secretary and members are selected by the school community. This committee mandate was extended to oversee and set the rules on the usage of the electricity in the school.	N/A
	B. School staff, students and families		The women group has an existing network with the island's church women's group and are active members of KPC Island Women's Group (Irekenrao)	N/A
Intended capacities	A. Operation and Maintenance of Solar Hybrid and water system	A. Policies and practices for O&M of solar hybrid and water systems	There was no operational and maintenance plan in place for the diesel gen-set as it is maintained only after its run of 300 hrs at MTSS. Operations and Maintenance Checklist developed by CBS (supplier of the solar system)	N/A

	B. System use and care		Servicing carried out by the Power Technicians with overall maintenance to be conducted by Energy Planning Unit (EPU) at costs paid by the school.	N/A
Activities	A. Operations training, maintenance training	A1. Workshop and discussion with the School committee to review policies and discuss O&M requirements of new systems. Rules of using the ASMC developed, refer to 190110 KI8 Rules ASMC A2. Schools management to integrate new system requirements into school systems and design ways to remind school members of their responsibilities such as meter readings and collection of tariffs.	N/A	N/A
	B. System awareness lecture, of new infrastructure with teachers, discussion and policy reflection and plan for teachers to show children systems and discuss use.	N/A	This awareness was carried out back to back to installation work and monitoring and evaluation. This was done in 2018 as part of the installation and training sessions and the commissioning.	N/A
Interaction with other levels		A. Interacts with individual training	Options to provide solar energy systems training to the school technicians by Kiribati Solar Energy Company (KSEC)[1] technicians who visit the islands every quarter. This was to be integrated into the school commitments towards operations and maintenance in the MOA. MOA between school and EPU signed.	MOA signed between ASMC and EPU provided details in the system management. The school was responsible for future maintenance and spare parts replacements and MISE to provide support when needed. However, the Energy Revolving Fund from collection of tariffs was to

[1] KSEC changed name in May 2020 to KGES – Kiribati Green Energy Solutions

				support future maintenance.
Complementarity activities by other projects/actors in the same line of action		N/A	The EPU has installed similar systems in two communities on the same island where ASMC is based and therefore the project is benefitting from this experience. The EPU technicians are to be responsible for the installation of the ASMC solar PV hybrid system.	N/A

1.6.2 Island Councils and Junior Secondary Schools

Table 5. Tabuaeran Island Council Capacity Development Strategy

Phase	**Individuals**	**Organisations**	**Society**	**National level**
	Competence development	**Organisational development**	**Development of cooperation systems**	**Development of enabling frameworks**
SWOT in the area of social concern	A. Maintenance or Power Technicians/Officers Qualifications	A. The Island Council will establish a Solar Energy Governance Committee, members are the Major, Clerk, Carpenter, Solar Technician (either KSEC or Island Council) and reps from the councillors and the Fisheries Assistant who looks after the Solar Ice Plant. The Island Education Officer will also be representing the schools (JSS).	The Island Council has already set up a Committee that oversees project activities. The Island Council appointed the IT technician to oversee the operations of both the island solar ice plant, the island council and JSS energy systems. He was to read the kWh meters at the beginning of each month and gave the readings to the Treasurer to deduct the electricity costs from each ministry vote. The treasurer was also trained to read the meters. Tariff rate was set up at 50 cents per kWh. LOA was developed and signed between the users and the Island Council, electricity provider.	The Kiribati Integrated Energy Roadmap (KIER) Monitoring and Evaluation framework log-frame was part of this report.

Phase	Individuals	Organisations	Society	National level
	Competence development	**Organisational development**	**Development of cooperation systems**	**Development of enabling frameworks**
	B. Island Council Technician should be recruited and trained	There is organised networks of old men and women on Tabuaeran which are quite active. Also church communities are well organised. There is no solar technicians on the island of Tabuaeran	2 solar energy system on Tabuaeran already built: 10kw for ice plant and 10kw under this project for island council office and JSS. The island council was to invest in training of solar power since there was planning to increase the use of solar on the island. Currently there are no competent persons on Kiritimati islands and EPU Energy Supervisor has to fly in from Tarawa to replace fault spare parts for the Ice plant solar PV system. There is one EPU technician on Kiritimati who was to provide technical support.	The KIR-RET and National Energy Policy and Island Council to include staff developments on renewable energy installations and operations.
Intended capacities	A. Operation and Maintenance of Solar Energy Systems	A. Policies and practices for O&M of solar energy systems to be provided through a technical training to recruited solar technician. B. The Kiritimati Island Energy Planner (Assistant) will need to provide technical support to the island council solar energy systems	The Tabuaeran Island Council has a basic solar system 800W currently used for the internet services and for the clerk's office. There was a need to move this to the health centre however the island council has to approve. There is no Operations and Maintenance Plan for this system and the council has recently replace the inverter. The IT technician provides technical advice the maintenance of the small solar system.	A LOA developed between National Government ministries (MISE, MIA and MOE and MLPID) developed and includes agreed tasks and activities to complete the installation, training, operations, maintenance, governance and commissioning, and handing over of asset. MLPID to provide overall support to the development of the outer island of the Line and Phoenix Group of Islands, including Teraina and Tabuaeran.
	B. System use and care		There was no service provider for solar systems on the island. EPU technician visited the island if need trouble shooting and replacement servicing for the ice plant.	A Term of Reference for a Solar Technician was drafted to assist the Power/solar Technician carry out the required work.

Phase	Individuals	Organisations	Society	National level
	Competence development	**Organisational development**	**Development of cooperation systems**	**Development of enabling frameworks**
			The IT technician was given the task to operate the solar system and was trained basic operations during the installations.	
Activities	A. Operations training, maintenance training	A1. Workshop to review policies and discuss O&M requirements of new systems A2. Workshop to highlight the benefits of using energy efficient appliances and energy conservation practices for the council staff/workers and JSS staff.	Technical Workshops on solar system components load supply and demands, create awareness on the maximum loads, energy efficiency and conservation, sustainability, tariff settings and governance were conducted for both sites, Island Council staff and JSS schools.	Renewable energy projects in the outer islands to consider Energy efficiency in new solar PV installations; to consider more efficient appliances, such as energy rated appliances, fridges, LED lights and incorporate energy efficiency and conservation.
Interaction with other levels	A. Councils Sub committees	A. Interacts with individual training B. Councillors sits in Island Development Committee, School Committee, Health Committee, School Improvement Planning Committee and Social Committee	The Maintenance Sub Committee to oversee the management and sustainability of the solar energy system through monitoring its usages, money collected, etc. EPU offered technical training on the solar system during the commissioning and the island council has someone in place that could be trained on how to operate, trouble shoot and contact EPU in Kiritimati when technical issues arise.	Tabuaeran Islands have active networks of women, old men and teachers. The RE and EE trainings should be organised with all different organised groups, (if time and budget allows) not only at the Island Council but also to the Island gender groups. The whole island has limited productive use of electricity due to the lack of access, except at the Island Council – internet use and at the Ice Plant) ice block making and cold storage. It was noted that church groups like the Catholic Guest House uses gen-sets with normal fluorescent lights and these could be replaced with LED lights.
Complementarity activities by other projects/actors in the	A. Integration of water needs of JSS school community on Teraina B. Including Heath and Police Office in the action		There is a request of water pump at JSS Teraina due to the water salinity at the household level. No water assessments being done however there is water solar pump installed at the Primary School.	The KIR-REP to encompass the energy needs of all-important services on the island such as fisheries, health, police, schools, agriculture, island council. Also, to look at productive opportunities for women and men and also their strategic needs, how to

Phase	Individuals	Organisations	Society	National level
	Competence development	**Organisational development**	**Development of cooperation systems**	**Development of enabling frameworks**
same line of action			The Police office, guest house and medical centres are included in the project so they will have better access to quality lights and 24 hours access to power.	access meeting places, computers, etc so they can learn and be more empowered.

1.6.3 Teraina Island Council

Table 6. Teraina Island Council Capacity Development Strategy

Phase	Individuals	Organisations	Society	National level
	Competence development	**Organisational development**	**Development of cooperation systems**	**Development of enabling frameworks**
SWOT in the area of social concern	A. Maintenance or Power Technicians/Officers Qualifications	A. The Teraina Island Council establishes an Energy Committee with members Major, Vice Major, Clerk, Unimwane, and the IEC. The Island Education Officer represents the schools (JSS) and JSS and Primary for the Teraina	The Island Council has already set up a Committee that oversees project activities. The Island Council appointed the assistant carpenter to oversee the operations of the solar PV system and the energy systems. He was to read the kWh meters at the beginning of each month and to provide the readings to the Treasurer to deduct the electricity costs from each ministry vote. The Island Development Officer was also trained to read the meters. Tariff rate was set up at 50 cents per kWh. LOA was developed and signed between the users and the Island Council, electricity provider.	The Kiribati Integrated Energy Roadmap (KIER) Monitoring and Evaluation framework log-frame was part of this report.
	B. Island Council Technician should be recruited and trained	An organised network of old men and women on both islands were quite active. Also, church communities were well organised.	There were 3 energy systems installations, ice plant, Island council office and JSS. The island council was to recruit a solar technician or upgrade the skills of its Power technician to oversee the maintenance and operations of	The KIR-RET and National Energy Policy and Island Council to include staff developments on renewable energy installations and operations.

Phase	Individuals	Organisations	Society	National level
	Competence development	**Organisational development**	**Development of cooperation systems**	**Development of enabling frameworks**
		However, there were no solar technicians on the island of Tabuaeran and Teraina.	these systems and can support future installations.	
Intended capacities	A. Operation and Maintenance of Solar Energy Systems	A. Policies and practices for O&M of solar energy systems to be provided through a technical training to recruited solar technician. B. The Kiritimati Island Energy Planner (Assistant) will need to provide technical support to the island council solar energy systems	The Teraina Island Council 800 W solar system for internet use not operational. The Council internet and office and Guest House powered by the Ice Plant Solar System installed early 2017.	A LOA developed and signed between National Government ministries (MISE, MIA and MOE) signed on the project governance and responsibilities to the completion of the solar PV system including its future operations, maintenance and governance Agreements between GOK and users was also developed for the Island Councils governance system.
	B. System use and care		Servicing of the existing Solar plant was done by the Fisheries Assistant (FA). The Mechanic or Power technician to maintain and provides support to the Island Council new system	The work on the system maintenance and reading of tariffs was integrated as part of the responsibilities of the assistant mechanic.
Activities	A. Operations training, maintenance training	A1. Workshop to review policies and discuss O&M requirements of new systems A2. Workshop to highlight the benefits of using energy efficient appliances and energy conservation practices for the council staff/workers and JSS staff.	The Governance Working Group meeting and updated on their roles both for the schools and the council towards the operations and maintenance of the solar systems.	KIR-REP to consider Energy efficiency as one of the thematic areas and new solar PV installations to consider more efficient appliances, such as energy rated appliances, fridges, LED lights as well as energy efficiency and conservation.
Interaction with other levels	A. Councils Sub committees	Interacts with individual training	EPU offered technical training on the solar system during the installations and commissioning and the island council nominated	Tabuaeran Islands have active networks of women, old men and teachers. There RE and EE trainings should be organised with

Phase	Individuals	Organisations	Society	National level
	Competence development	**Organisational development**	**Development of cooperation systems**	**Development of enabling frameworks**
		Councillors sits in Island Development Committee, School Committee, Health Committee, School Improvement Planning Committee and Social Committee and this involves budget as they get sitting allowances.	the assistant carpenter and trained on the basic operations and trouble shoot. However, with major technical issues, EPU in Kiritimati to be contacted, however costs involved (travel costs and DSA) to be paid by the island council. This is like other works on the Ice plant or internet problems.	all different organised groups not only at the Island Council level but also to the Island gender groups. The whole island has limited productive use of electricity due to the lack of access to electricity and basic knowledge on productive activities. However, internet use ais widely use for communications and use of social media.
Complementarity activities by other projects/actors in the same line of action	C. Integration of water needs of JSS school community on Teraina D. Including Heath and Police Office in the action		There is a request of water pump at JSS Teraina due to the water salinity at the household level. No water assessments being done however there is water solar pump installed at the Primary School. The Police office, guest house and medical centres are included in the project, to improve access to better lights and increase access to electricity to 24 hours per day.	Rural Electrification Framework to encompass the gender and energy needs of all the major and vital important services on the island, such as health, schools and policing including governance (island council).

1.6.4 Taimanin Teraina JSS & Sunlight Primary School

Table 7. Teraina Schools Capacity Development Strategy

Phase	Individuals	Organisations	Society	National level
	Competence development	**Organisational development**	**Development of cooperation systems**	**Development of enabling frameworks**
SWOT in the area of social concern	A. Maintenance or Power Technicians/Officers Qualifications	A. The Island Council integrated the management of the solar energy system into an existing Project Management Committee and members are the Major, Clerk, Carpenter, Solar Technician (either KSEC or Island Council) and reps from the councillors. The Island Education Officer will also be representing the schools (JSS) for Tabuaeran and JSS and Primary for the Teraina.	Both JSS and Primary Schools had separate Committees that oversees school activities and guides decision making. The School Committees appointed two members from each committee to provide daily support to the operations of the solar systems and are to be trained on this. The Island School carpenter was given the role as a power technician and had provided support during the installations and operations of the school solar system.	The Kiribati Integrated Energy Roadmap (KIER) Monitoring and Evaluation framework log-frame to include outputs from this project A rural electrification paper to be drafted and to include rural electrification models and governance and sustainability systems that are being integrated in this project.
	B. Island Council Technician should be recruited and trained	There was an organised network of old men and women on both islands which are quite active. Also, church communities are well organised. The schoolteachers also had a network on its own. There was no solar technician on the island of Tabuaeran and Teraina.	There were 4 solar energy systems on Teraina, and the island council should emphasise the need to have a qualified solar technician recruited to oversee the maintenance and operations of these systems. Currently there are no competent persons on Kiritimati islands and EPU Energy Supervisor must fly in from Tarawa to replace fault spare parts. The Energy Officer on Kiribati participated in this solar system installation and was able to provide back up services when needed. However, the island council and the school to pay related costs.	The island council to Include in its staff development the need to recruit a power or solar technician.
Intended capacities	A. Operation and Maintenance of Solar Energy Systems	A. Policies and practices for O&M of solar energy systems to be provided through a technical training to recruited solar technician.	The Teraina Island Council had a 800 kw system but was not operational for almost a year. Prior to installations of this energy system, (10kW) the Council internet and office was powered by the Ice	A MOA developed that would identify activities to be delivered by both the Island Councils and the EPU in regard to the long

Phase	Individuals	Organisations	Society	National level
	Competence development	**Organisational development**	**Development of cooperation systems**	**Development of enabling frameworks**
		B. The Kiritimati Island Energy Planner (Assistant) will need to provide technical support to the island council solar energy systems	Plant Solar System installed early 2017. This same system also provides lights to the guest house.	term maintenance of the solar systems.
	B. System use and care		Servicing of the existing energy system on Teraina is non-existence, however this project would have trained the current power technician on maintenance of the solar system.	
Activities	A. Operations training, maintenance training	A1. Workshop to review policies and discuss O&M requirements of new systems A2. Workshop to highlight the benefits of using energy efficient appliances and energy conservation practices for the council staff/workers and JSS staff and students.	The Governance Working Group meeting and updates on their roles both for the schools and the council	Rural Electrification policy to consider Energy efficiency as one of the thematic areas and new installations to consider more efficient appliances.
Interaction with other levels	A. Councils Sub committees	C. Interacts with individual training D. Councillors sits in Island Development Committee, School Committee, Health Committee, School Improvement Planning Committee and Social Committee	EPU technicians offered technical training on the solar system during the commissioning.	Teraina Islands have active networks of women, old men and teachers.
Complementarity activities by other projects/actors in the same line of action	E. Integration of water needs of JSS school community on Teraina F. Including Heath and Police Office in the action		There was a request of water pump at JSS Teraina due to the water salinity. This project provided a water tank and some materials to upgrade the rainwater catchment. The Police office, guest house and medical centres are included in the project, so they have better access to lights and 24 hours access to power.	Rural Electrification Framework to encompass the need of all-important services on the island including health, policing, water, lights (household) and probably some income generating activities through use of electricity.

2.0 Cooperation System

4.1 Stakeholders

Table 8: Project Stakeholders

Stakeholder	Organization	Role
Key Actors		
Choi Yeeting Climate Change Coordinator (OB) & Secretariat to KNEG	Kiribati National Expert Group (KNEG) – meeting held quarterly	The group provided technical advice and guidance on all Climate Change and Disaster Risk Management projects. The group, consisting of departmental secretaries and directors, advised project outputs and approved adoption of project measures within the government structures.
Kireua B. Kaiea Manager, EPU	Ministry of Public Works and Utilities	Line manager for the Energy Planning Unit of the Ministry of Public Works and Utilities (later renamed to MISE – Ministry of Industries and Sustainable Energy) , EPU staff supported the project and coordinated MPWU involvement in the implementation. This project supports the KNEP priority area 6 through the installation of 4 systems, total installed capacity of 41.2kW solar PV systems. 20kW solar system at ASMC, 11.1kW on Tabuaeran Island and 5.5kW x 2 on Teraina Island.
Kebwa Teremita Chief Water Engineer Officer in Chareg	Ministry of Public Works and Utilities	Line manager for MPWU (MISE) staff supported the water component in MTSS and coordinate MPWU involvement. However, when MTSS was closed, this component was also not done.
Tavita Metai CEO	Kiribati Solar Energy Company (KSEC),	Kiribati Solar Energy Company (KSEC)[2] staff on Kiritimati Island, Provided support to the installation of the Tabuaeran energy systems
Ms Maryanne Mikaere Secretary	Office of Te Beretitenti (OB- Office of the President), Government of Kiribati	Focal Point in Lead National Agency for Project. The Secretary of the OB changed during implementation. The former Secretary was Ms Saitofi Mika who had supported the initial planning of the overall ACSE project for Kiribati.
Tukabu Tauati Secretary	National Economic Planning Office (MEPO) within the Ministry of Finance and Economic Development (MFED)	Provided guidance to OB (Office of the President) on donor projects.

[2] In May 2020, KSEC was named to KGES (Kiribati Green Energy Solutions)

Bwakura Metutera Timeon Secretary	Ministry of Education	In charge of funding and operational policies for Kiribati schools
Eretia Monite Senior Education Officer	Ministry of Education	In charge of Senior Secondary schools and Scholarships
Kibau Rimon, Secretary,	Kiribati Uniting Church (KUC) Education Committee	Responsible for school policies and procedures and involved with MoA between ASMC and Ministry of Education (MoE) for systems operation and maintenance
Koin Etuati ACSE Project Manager	Energy Policy Officer, Economic Development Division (EDD), SPC, Suva	Implementing Partner designated officer responsible for supporting project activities in country
Birita Mamoe Principal, ASMC	Project Working Group - AMSC, Abemama Island	Logistics and coordination team for project supporting the ACSE Project Manager and Project Officer
KUC Education Island Council Board	Project Working Group - MTSS, Fanning Island	Logistics and coordination team for project supporting the ACSE Project Manager and Project Officer
Craig Bohm Technical Adviser **Ravinesh Nand** – Technical Advisor	GIZ	Project oversight and technical advice on behalf of GIZ.
Primary Actors		
Tarakabu Tofinga EU-GIZ ACSE In-Country Coordinator (ICC)	Office of the President, Government of Kiribati	Coordinator between National Energy Planning Office (NEPO) of the Ministry of Finance and Economic Development, OB and Ministry of Environment, Land and Agriculture (MELAD) and GIZ for KI9 project. Supported the implementation of the technical and financial aspects of the project.
Shanupriya Sharma Project Finance Manager	SPC, Economic Development Division (EDD), Suva	Leads on reporting finances and submission of technical reports to GIZ on behalf of the contracting party.
Uere Atanrerei Outer-island Council Clerk	Operating under the Ministry of Internal Affairs (MIA)	Provided logistics supports and personnel to the ASMC – under the MoA
School Staff and students	ASMC, Abemama Island	Helped shape system design, participate in trainings and use of system
School Staff and students	Taimanin Teraina Junior Secondary School	Helped shape system design, participate in trainings and use of system
School Staff and students	Teraina Sunlight Primary School	Helped shape system design, participate in trainings and use of system
School Staff and students	Keina Tiito Junior Secondary School	Helped shape system design, participate in trainings and use of system
Pulou Acting Clerk, Tabuaeran Island Council	Operating under the Ministry of Internal Affairs (MIA)	Coordination of work on Tabuaeran, labour mobilisation, electrical work budget and installation costs, power technician recruitment

Tiirenga Riannaba Clerk, Teraina Island Council	Operating under the Ministry of Internal Affairs (MIA)	Coordination of work on Teraina, labour mobilisation, electrical work budget and installation costs, power technician recruitment
Atainimango Botioa Fetu Ale	Island Development Officers, Teraina Island Council and Tabuaeran	Provided supports to any project conducted on the island including this EU-GIZ project.
Island Councillors	Council meetings held twice a year; councillors are selected to sit in sub committees	Represented each village (8 villages on Tabuaeran and 7 villages on Teraina). Support and provided the labours required in the trenching of ground for underground cables however the labourers paid by the project.
Secondary Actors		
Linda Ueanteang Mayor	Abemama Island Council	Logistics support on Island and involved in the commissioning of the ASMC project.
Tateti Accountant	Ministry of Internal Affairs, Government of Kiribati	Officers at different points who supported the project - on islands or in MPWU. On islands Terain and Tabuaeran, supported the set up of the Revolving Credit Fund for schools and island councils.
Peter Eritara Accountant	Ministry of Public Works Utilities	
Solar Technician	Island Councils Technician	Reported to the island council and provided technical advice on all solar energy systems in the island including solar home system, telecommunications, police, Chevalier Secondary School
Willie Smith - Water Foreman	Fanning Island Council - Ministry of Lines and Phoenix Islands Development	Assessed the water quality and quantity for MTSS
Kanofou Kieni Mayor	Teraina Island Council	Decision making and logistics support on Island. System handed over from the Government of Kiribati represented by the Ministry of Lines and Phoenix Development to the mayor representing the island council and communities.
Teinai Taniera, Major	Tabuaeran Island Council	Decision making and logistics support on Island. System handed over from the Government of Kiribati represented by the Ministry of Lines and Phoenix Development to the mayor representing the island council and communities.

3.0 Project Steering

3.1. Steering Structure

Table 9: Steering Committee representatives Summary of project start up and management documents

Steering participants	Participation	Responsibility
Maryanne Mikaere Namakin *Secretary* *Mr.Mike Foon* *Climate Change Adviser* Mr Ruui Tabutoa, Deputy Secretary, Office of te Beretitenti	Oversight of project	Project focal points, planning, coordination and conflict management
Tarakabu Tofinga EU-GIZ ACSE In-Country Coordinator (ICC)	Office of the President, Government of Kiribati	Coordinator between NEPO/MFED, OB and MELAD and GIZ. Support the implementation of the technical and financial aspects of the project.
Kiribati National Expert Group (KNEG) The group, consisting of departmental secretaries and directors, will advise project outputs and approve adoption of project measures within the government structures.	High level project steering committee for major outputs/direction	Decided on project direction or approved variations to project scope.
Kireua B. Kaiea Manager, Energy Planning Unit Ministry of Public Works and Utilities	Participated in the two project working groups. May send ACSE Project Officer when absent.	Line manager for the Energy Planning Unit of the Ministry of Public Works and Utilities (later renamed to MISE – Ministry of Industries and Sustainable Energy) , EPU staff supported the project and coordinated MPWU involvement in the implementation. This project supports the KNEP priority area 6 through the installation of 4 systems, total installed capacity of 41.2kW

		solar PV systems. 20kW solar system at ASMC, 11.1kW on Tabuaeran Island and 5.5kW x 2 on Teraina Island.
Beria Oromita Energy Supervisor, EPU MISE, formerly the Ministry of Public Works and Utilities	Major inputs into the technical design and installations. Provide technical trainings	Liaise directly on logistics regarding shipment and inspection of solar energy system equipment. Supervised installations of solar PV hybrid system.
Lokea Itienang Energy Technician, EPU MISE	Participated in the installation of the ASMC and supervise the installation of the Teraina Solar Energy Ssytems	Liaise directly on logistics regarding shipment and inspection of solar energy system equipment. Supervised installations of solar PV hybrid system.
Toomi Tarangkoa **Assistant Energy Planner** **MISE, based on Kiritimati Island**	Participates in the MTSS assessments and installations of Teraina soalr systems	Liaise directly on logistics regarding shipment and inspection of solar energy system equipment. Supervised installations of solar PV hybrid system.
Bwakura Metutera Timeon Permanent Secretary Ministry of Education	Participant in the two projects' working groups for issues relating to the ministry.	Responsible for school policies and procedures and possibly involved with LOA between school and MoE for systems operation and maintenance
Bwereti Tewareka Deputy Secretary Ministry of Line and Phoenix Development	Represents the GOK in the handing over of the systems to the two islands. Oversees the work on the maintenance of the two JSS on Tabuaeran and Teraina.	Responsible for development works for the Line and Phoenix Group of Islands, including Teraina and Tabuaeran.
Eretia Monite Senior Education Officer Ministry of Education	Consulted regarding the MTSS and other secondary issues such as funding, teachers, budget etc	In charge of Senior Secondary schools and Scholarship
Reetina Katokita Director Policy, Planning & Development Division Ministry of Education, **Ms Taaruru Taoaba** **Mr Kuureta Toakai, Facility Management Unit, MOE**	Consulted in regard to the MTSS and other secondary issues such as funding, teachers, budget, construction etc	In charge of Senior Secondary schools and JSS management

Koin Etuati ACSE Project Manager SPC, Economic Development Division (EDD) Suva	Participant in the two project working groups.	Implementing Partner designated project manager with overarching responsibility for project output delivery.

1.2 Plan of Operations

Table 10 presents the final project work plan as the project team implemented it

Table 10: Summary of project start up and management documents

	Deliverable	Activities description	2016	2017				2018				2019			2020	
			Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3-Q4	Q1-2	Q3-Q4
Outcome	**Energy and Water Systems**: Two Solar-Hybrid systems installed, each one sustainably operated and effectively meeting the current and predicted future needs of the respective boarding school communities.															
Output 1	**Design of 2 Solar-hybrid systems and 1 solar water pumping system complete**															
Activities	**1.1**	Develop TOR for call on proposals for system design including supporting infrastructure (housing, wiring, etc), gender analysis, future energy demand and solar/hybrid system's equipment standard														
	1.2	Two scoping missions – travel cost for system designing, including water assessment – Abemama and Fanning														
	1.3	Contract fee to carry out site survey and designing energy systems for both schools														
	1.5	Conduct Cost Benefit Analysis (Personnel cost)														
	1.6	Conduct Cost Benefit Analysis (Travel cost)														

	Deliverable	Activities description	2016	2017				2018				2019			2020	
			Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3-Q4	Q1-2	Q3-Q4
Output 2	**Procurement and installation of 2 solar hybrid systems and 1 solar water pumping system complete**															
Activities	**2.1**	Develop a TOR for procurement of equipment for the Solar PV hybrid systems in the two schools based on Solar PV System Design as in 1.1														
	2.3	Develop tendering document - turnkey contract on PROCUREMENT, TRANSPORT PLAN, INSTALLATION, WASTE DISPOSAL PLAN based on Solar PV System Design No. 2.1														
	2.4A to 2.10B	Equipment Costs - solar panels, batteries, inverters, mounting posts, grid cables, etc for 16kW (changed to 11kw system for Fanning and 2 sets of 5.5kW system for Teraina) including insurance, international freight, direct to Kiritimati and Fanning Island and Teraina island. *Construction Equipment*[3]														
	2.4B to 2.10B	Equipment Costs -, solar panels, batteries, inverters, mounting posts, grid cable, etc for a 7kW system (changed to 20kW system for Abemama) including insurance and freight to Tarawa port. Includes freight cost to Abemama														

[3] There is a need to extend the project timeline to mid-year 2019 due to the closing of MTSS and decision on the replacement. The need to carry out the gender and energy needs assessment including the solar pv design takes time and the supply of equipment would not happen before end of 2018.

	Deliverable	Activities description	2016	2017				2018				2019			2020	
			Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3-Q4	Q1-2	Q3-Q4
		Installation of solar PV systems - (4 technicians and two Project Management - 7 days in Abemama														
Output 3	**School communities trained in renewable energy and water conservation and management practices.**															
Activities	**3.1 – 3.6**	Design a Training – establish Sinking fund account, training manuals (developed by the supplier) and deliver trainings during scoping mission and installations														
Output 4	**Operations and maintenance plans for energy and water systems produced with and adopted by both schools and under agreement with the Government of Kiribati**															
Activities	**1.4**	Form a Project Working Group for each island including costs on delivery of meetings.														
	4.1 - 4.4	Establish a Governance Working Group (GWG), Inception Meeting – (MoE, MEFP, MPWU, KUC, Ministry of Linnix)														
	4.5	Reflect involvement in this activity in the MoA signed by OB, MEST and each school. Consider involvement of Local Government.														
Output 5	**Project monitoring and evaluation system implemented**															
Activities	**6.1**	Develop and M&E tracking framework														
Output 6	**Organisational**															
Activities	**7.1**	Develop K&M (knowledge management) products including standard photo points, data collation														

	Deliverable	Activities description	2016	2017				2018				2019			2020	
			Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3-Q4	Q1-2	Q3-Q4
		and analysis and publications of progress reports														
	7.2a	ICC travel cost														
	7.2.c – 7.3 c	SPC – Kiribati based and ICC communication costs														
	7.3 a	SPC Kiribati based Project Officer Salary Package- to change to travel costs and personnel, external auditor.														
	7.2 b - 7.3b	SPC – Kiribati-based Project Officer and ICC Operating Equipment														
	7.4	Third party – Financial Audits														
	8.1	Finance and Administration														
	9.1	Over-Heads														

4.0 Results Oriented Monitoring

Table 10 below lists all project deliverables including Annex 7 technical reports, workshop reports of all kinds, policies, plans, manuals, guidelines, project evaluation reports and consultancy reports in chronological order.

Table 11: Project reports and related documents

Project Reports
161101 KI8 - Annex 7 Technical Report No.1
161101 KI8 - Annex 7 Technical Report No.2
161107 KI8 - Cost Benefit Analysis – ToR
170412 KI8 – Project Article in Pacific Energizer Issue 23
170810 KI8 - ASMC Site Survey Report
170202 KI8 - Presentation to Parliamentary Committee
170903 KI8 - ASMC Cost Benefit Analysis Report
170903 KI8 - MTSS Cost Benefit Analysis Report
170904 KI8 - ASMC + MTSS CBA Presentation
171101 KI8 - ASMC Design Mission - ToR
171129 KI8 - Annex 7 Technical Report No.3
171215 KI8 - St Leo School Rapid Assessments Report
180130 KI8 - ASMC Gender and Energy Assessment Report
180207 KI8 - Tabuaeran Site Survey Report
180219 KI8 - Mid Term Project Review Report
180313 KI8 - ASMC Memorandum of Agreement
180313 KI8 - Change of Target Schools Letter to GIZ from GoK
180319 KI8 - ASMC Request for Proposal to Supply Solar System
180320 KI8 - MTSS Gender and Energy Assessment Report
180401 KI8 - Island Council and JSS Design Mission - ToR
180419 KI8 - ASMC Solar Installation - TOR
180511 KI8 - ASMC Supply Contract - Financial Evaluation Report
180511 KI8 - ASMC Supply Contract - Technical Evaluation Report
180604 KI8 - ASMC Supply Contract - CBS
180705 KI8 - Annex 7 Technical Report No.4
180705 KI8 - Annex 7 Technical Report No.4 Annexes
180105 KI8 – Tabuaeran Site Survey Report
180813 KI8 - Island Councils and JSS - Gender Needs and Design Report
181001 KI8 - ASMC Solar System Equipment Inspection Report - CBS
181005 KI8 - Tabuaeran Solar System Design Report
181015 KI8 - Tabuaeran Solar System Installation - TOR
181101 KI8 – ASMC Installation Report
181101 KI8 - ASMC Acceptance Certificate
181101 KI8 - Peer Learning Workshop Report

181118 KI8 - ASMC Commission and Handover Media Brief
181122 KI8 - ASMC Commissioning Media - Kiribati Uekera Issue#47_2018
181122 KI8 - ASMC Commissioning Media - Uekera Issue#47_2018
181204 KI8 - Teraina Island Council and Schools - Solar System Design Report
181207 KI8 - ASMC Commissioning Media - Kiribati News Star
190201 KI8 - ASMC Solar System Evaluation - ToR
190302 KI8 – Inter-Ministerial Meeting Minutes re Solar System Governance
190404 KI8 - Annex 7 Technical Report No.5
190404 KI8 - Annex 7 Technical Report No.6
190405 KI8 - Teraina Tabuaeran Solar Contract - Technical Evaluation Report
190510 KI8 - Teraina Tabuaeran Electrical Systems - Request for Quotation
190531 KI8 - Teraina Tabuaeran Solar Supply Contract - Clay Energy
190819 KI8 - Project Variation 1 - Justification Letter
190819 KI8 - Project Variation 1 - Proposal
190901 KI8 – Line Islands Solar Systems Installation & Commissioning- TOR
191015 KI8 - Energy Efficiency and System Governance Trainings - ToR
191028 KI8 – Line Islands Solar Systems – Ministerial - LoA
191028 KI8 – LOA Teraina Island Council - Ministries
191028 KI8 – LOA Teraina Island Council – Schools
191031 KI8 – LOA Tabuaeran Island Council – Ministries
191105 KI8 TOR JSS Teraina and Tabuaeran Water Improvement Infrastructure
191105 KI8 - Project Trainings Report
191114 KI8 – LOA SPC, MISE, MIA, MLIPD Tabuaeran and Teraina Island Systems
191115 KI8 – Tabuaeran Installation Report
200117 KI8 – Teraina Installation Report
190901 KI8 – Line Islands Installation and Commissioning ToR
190930 KI8 – Annex 7 Technical Report No.7
191105 KI8 – Water Infrastructure Installations - ToR
200103 – KI8 Electricity Use Rules _ ASMC
200107 KI8 – Project Knowledge Products
200205 KI8 Teraina Island council Solar PV System Commissioning Sheet
200205 KI8 – Asset Register Teraina Island Council
200205 KI8 – Asset Register Teraina Schools
200205 KI8 – Teraina Island Council Acceptance Certificate
200205 KI8 – Teraina Schools Acceptance Certificate
200207 KI8 - Tabuaeran island Council solar PV System Commissioning Sheet
200207 KI8 - Asset Register Tabuaeran Island Council and JSS
200207 KI8 –Tabuaeran Island Council Acceptance Certificate
200207 KI8 Teraina and Tabuaeran Solar system impacts
20030 KI8 Solar Systems Governance Report + LOAs
200430 KI8 – Teraina and Tabuaeran Commissioning Stories and Media Brief
200815 KI8 Water Infrastructure Report

200831 KI8 Annex 7 Technical Report No. 8
200903 KI8 – Final Project Report (this report)
200903 KI8 – Final Project Evaluation Report

4.1. Key Results – Solar systems installed

i. Alfred Sadd Memorial College

Figure 1. ASMC 20 kW solar panels ground mounted installation, Abemama Island

The project installed a 20 kW solar PV system at the Alfr
in the Gilbert Group of Islands. The school is managed

Before the project, the school powered school facilities

Thanks to the new solar system, the school generated
days a week to all school facilities and all 18 school hou

The school has instituted an energy capping system, using 2 and 6 amp circuit breakers, strict user guidelines, energy efficient appliances and a fundraising programme, to pay for repairs to the solar system.

Figure 2. Solar inverters and controllers, Teraina JSS

Beneficiaries report that the system has expanded night time activities, including study times for students, and one teacher decided to stay on longer at the school now that her house was serviced with electricity.

See report titled: 181122 KI8 – ASMC Installation Report

ii. Teraina Island Council

The project installed a 5.5 kW solar PV system at the Teraina Island Council.

Figure 3. Teraina Island Council buildings

The council services the island with administration and banking facilities, internet and office space for national government ministries.

The council buildings consist of the two main office buildings, a maneaba between them and 2 separate offices at the rear of the complex. A separate guest house is nearby.

The solar array however, was installed on the roof of the Police Post, on the opposite side of the road, given that its roof was more recently constructed and provided the solar array with a more substantial foundation.

Figure 4. 5kW solar installation at Police Post, Teraina

A power line runs from the Police Post to the Island Council and from there is re-distributed to the council offices, guest house, back to the Police Post and to the Health Center, located behind the Police Post.

Figure 5. solar inverters and controller at the JSS

The council has instituted an energy tariff system and sinking fund as discussed with the project team during the planning, installation and commissioning. By January 2020, the Island Council and JSS has put aside money collected from the month of February since commissioning. An email from the Teraina Clerk in July reported that the school has deposited to the council $80.00 for electricity and the council has collected $148.80.

Night time security lighting around the island council buildings has changed the nature of the areas use. Many people crown around the council maneaba in the evenings to use the internet service, and due to the lighting provided by the project, has become quite the hub of activity. Some women even sleep in the maneaba while their husbands are away. The Senior Police Constable reports that the Police Post is more secure now that it has security lighting and he can now finally digitise his report. The medical assistant at the Health Center says she can now purchase an electronic asthma machine for her 4 chronic asthma sufferers. Normally they must boil water on an open fire daily for this purpose.

Figure 6. Nighttime use of Council maneaba with good lights from solar and internet use, safety nights installed around the premises.

See report titled: 200117 KI8 – Teraina Installation Report

iii. Teraina JSS and Primary School

The project installed a 5.5 kW solar PV system at the Junior Secondary School (JSS). A feeder electricity line runs from underground from the JSS to the primary school.

The system generates 240 volts of electricity, which powers all school buildings at the JSS as well as the main classroom block, including office, at the primary school.

Figure 7. JSS & Primary school teachers during commissioning

The JSS will eventually extend the power network to include the new school maneaba (meeting house), which is not yet constructed. The primary school will also extend its power network to include more classroom blocks, as resources allow.

The solar energy is evenly shared between the 2 schools, with the potential load of each being capped by 6 amp circuit breakers. Each school operates on a separate electricity line, which is metered. The

meters will be periodically read, and the costs of repairs shared between the schools proportional to the amount of energy each has used.

The schools also agreed to establish a third, joint electricity line, which is also metered. This line will service shared facilities, such as the high energy using photocopy and joint fund raising activities. These include introducing a paid washing service and freezer space rental, all which are connected to this shared line.

Beneficiaries report that the new solar system means it is more convenient for teachers and students to use laptops and tablets for school delivery and also for students studying and exams. In the past, the school has to rely on printing papers but for now when there is no toner and paper available for printing of exams, electricity is readily available to charge tablets and laptops.

The school teachers, mostly made up of 80% women will benefit the most with the use of a washing machine that the school committee has agreed to purchase and use by teachers after school hours. There is excess power available for use of other productive uses of the solar power.

See report titled: 200117 KI8 – Teraina Installation Report

Figure 9. 5kw Solar panels roof mounted on both sides

Figure 8. Teraina JSS main classroom

iv. Tabuaeran Island Council + Junior Secondary School

The project installed an 11 kW solar system at the Tabuaeran Island Council. The solar array is housed in its own power room, and the solar array is mounted overhead on the council office roof.

Figure 10. Tabuaeran Island council office and maneaba installation – 10 kW solar system

Tabuaeran Island Council services the island with an array of administrative services and hosts a raft of national government offices. The island Police Post lies adjacent to the single 'L-shaped' council building. Each of the 15 government office rooms in the island council has one light, one light switch and one double power point, and the potential energy load of each is capped at 2 amps using a series of circuit breakers.

Each council office, of which there are 19, is retrofitted with a light socket, light switch, double power point, energy meter (housed in the main circuit board in the clerk's office) and an energy efficient LED light. The potential energy load from each office is capped using a 2 amp circuit breaker. Separate digital energy meters are also in place for the Police Post, maneaba and JSS.

Figure 11. Solar energy systems inverters and battery

Nearby, the council maintains a large community maneaba, which it leases out for various island functions and community group meetings. Both the Police Post and council maneaba are integrated into the solar system. Some 200 metres away from the council lies the Tabuaeran JSS. The project has connected the new solar system from the council to the JSS via a substantial underground feeder cable. From a junction box, housed in the principal's office, power is then distributed to the school maneaba and two main school buildings.

The island council and JSS have entered into systems governance and management agreement with all respective ministries and government-owned enterprises which have offices at the council. There are some 17 parties to the agreement. A new tariff system has been proposed to fund the maintenance of the solar system, but it will not be until 2020 that the tariff system is implemented. It will take some time for all relevant ministries to sign the multi-party Letter of Agreement and to establish a national system for allocating an electricity budget for ministry offices based at the council.

School beneficiaries report that they can now use laptops and power points presentations or educational clips to students during school hours due to the access to electricity through the solar system.

Government officers based at the island council report that they can now operate electric fans in their offices, as it can be extremely hot during the day time, and work in the evenings, where

needed. Also laptops are easily charged and used promptly during court hearings and minutes for meetings are now can be completed on time due to the access to power.

See report titled: 191115 KI8 – Tabuaeran Installation Report

v. Rainwater Harvesting Installations

As an additional action initiated by the project team, using unspent funds, the project supported Teraina and Tabuaeran Junior Secondary Schools by installing rainwater harvesting infrastructure on their main classroom blocks. The action included for Teraina JSS procuring one water tank, pipes, taps, gutters and other fittings from the main Kiritimati island shipping or air transporting these to the islands, and having on-island teams, supervised by our qualified and trusted solar technicians to attend to the installations. For Tabuaeran JSS, taps, pipes and gutters including roof insulation for the Staff Office procured from Kiritimati Island.

Figure 12. Water tanks inspected at the Teraina Primary school

The result of these efforts was that the students at both schools finally had access to a more reliable supply of potable water, at school during school hours. This was particularly important in these very remote island communities where water security is difficult to achieve and the complexities of accessing equipment, skills and funds to install rainwater harvesting systems beyond the capacities of the schools themselves. This additional action was much appreciated by the beneficiaries, and showed the donor and implementers to be adaptive and considerate to the

urgent needs of the local community.

Figure 13. Installed water cutters and pipes at Tabuaeran JSS

See report titled: 200709 KI8 – Water Infrastructure Report

vi. Systems Governance

The project established governance mechanism with beneficiaries of all four solar PV systems. The mechanisms included:

- Technical/hardware design features, such as the energy load capping using circuit breakers and
- separating beneficiaries onto parallel circuits.
- Installing digital energy meters.
- Establishing tariffing mechanisms.
- Setting up sinking funds for maintaining the solar systems.
- Helping beneficiaries define fundraising opportunities, to resource the maintenance of their solar systems, including provision of infrastructure (such as additional power points) to support this.
- Workshops to discuss energy governance with beneficiaries.

- Drafting 4 detailed Letters of Agreement (LoAs) between beneficiaries to formalise the governance arrangements of the solar systems; and,
- Making representation to the Government of Kiribati regarding the governance models developed in the project.

See report titled: 200230 KI8 – Solar Systems Governance Report

vii. Training

The project facilitated five formal trainings in energy efficiency and solar system governance with project beneficiaries. The trainings specifically covered the following topics:

- Project Overview and Context
- Energy Efficiency & Conservation Awareness
- Energy Consumption Calculations
- Energy Appliance Labeling and Standards
- Energy Management System
- Solar System Components & Costs
- Solar System Management
- Tariff-Setting (where applicable)
- Fundraising Opportunities

Figure 14. JSS Teachers looking at the power board at the Tabuaeran JSS staff office

Figure 15. ASMC teachers and student participated in the training

Figure 16. EPU technician provide information on solar system components to JSS Tabuaeran teachers

Figure 17. Teraina Island council training participants with project team

The trainings were all energetically attended by those who participated and helped beneficiaries better understand the nature of solar energy, the need for energy efficiency and need for energy management.

No. of trainings	Project sites	Female participants	Male participants
1	Alfred Sadd Memorial College	23	16
2	Teraina Junior Secondary School and Primary School	17	5
3	Teraina Island Council	9	2
4	Tabuaeran Island Council	8	16
5	Tabuaeran Junior Secondary School	4	5

See report titled: 191105 KI8 - Project Trainings Report

viii. Mid-term Project Review

This project undertook a mid-term review of its technical, financial and overall managerial performance. The team discussed how it could deliver more effectively and developed a forward planning action list of tasks to develop.

The review process was a new process for team members and forced the group to think critically and strategically about their work. The forward planning action list was particularly useful as it really helped guide the second half of the project. A full report is annexed.

See report titled: 180219 KI8 - Mid Term Project Review Report

ix. Final Project Evaluation

The project undertook a final evaluation and was critical about what it had achieved. This process was particularly useful as it gave the project team a chance to reconcile the considerable delays with delivering project with the reasons, but also to acknowledge that some things, such as speedier procurements, could have been done better.

See report titled: 200706 KI8 – Final Project Evaluation Report

4.2 Expenditure Summary

The financial settlements for the project are presented separately in the accountability for the project.

In summary though:

The project budget was €505,370.

The EU-GIZ contribution was €475,400. SPC (in-kind) - €1,725

Government of Kiribati (in-kind) - €28,245

The project spent – €453,226.69 (excluding in kind contributions)

The project had remaining at closure – €26,173.31

Include if there were any best practices for financial management that help save money. E.g. engagement of local consultant, cost sharing, multi partnership engagement etc.

4.3 Results - Monitoring and Evaluation Plan

Table 12 below presents the project monitoring and evaluation (M&E) plan. The plan presents achievement of results against the project indicators. Documents that validate the claims of achievement are also indicated.

Table 12 - Results achieved against the project monitoring and evaluation plan

Description	Indicator	Baseline	Target	Achievement	Means of Verification
Objective: To help achieve the government target of establishing renewable energy systems in 100% of boarding school across Kiribati.	Number of PV solar hybrid systems installed in the rural boarding schools.	8 rural boarding schools use solar PV hybrid systems (by 2014)	10 Solar PV hybrid systems in the rural boarding schools operating in 2018.	9 solar PV hybrid systems in the rural boarding schools operating in 2018. Alfred Sadd Memorial College (ASMC) system was commissioned in 2018. The second planned solar hybrid system installation was in MTSS, but MTSS school was closed in 2017 and the project restructured, as there were no other boarding schools to target. Instead the project targeted Junior Secondary Schools (JSS) integrated with Island Councils on Tabuaeran and Teraina islands.	• 181122 KI8 – ASMC Installation Report • 200205 KI8 Teraina Island Council Solar PV System Commissioning _Sheet • 202005 KI8 Teraina island council _ Acceptance Certificate • 191115 KI8 – Tabuaeran Installation Report • 200207 KI8 Tabuaeran island Council Solar PV System Commissioning _ Sheet • 200207 KI8 Tabuaeran island Council _Acceptance Certificate
Outcome: Two Solar - Hybrid systems installed, each one sustainably	Percentage share of renewable energy increased in	7% of renewable energy share in rural boarding	9% of renewable energy share in rural boarding	The team was unclear of how this measure was calculated. The remaining boarding school, ASMC, received solar	• 181122 KI8 – ASMC Installation Report • 200205 KI8 Teraina Island Council Solar PV System Commissioning _Sheet • 202005 KI8 Teraina island council _ Acceptance Certificate

Description	Indicator	Baseline	Target	Achievement	Means of Verification
operated and effectively meeting the current and predicted future needs of the respective boarding school communities.	secondary schools	school in 2014	schools by 2018	power, after MTSS was shut down. The systems are now operational and are effectively meeting the current and predicted future needs of the respective school communities. Due to the closure of MTSS, the project installed 3 additional solar systems and provided power to Tabuaeran Junior Secondary School (JSS) as well as Teraina JSS and Teraina Primary School. The solar systems were operational and were effectively meeting the current and predicted future needs of the respective school communities.	• 191115 KI8 – Tabuaeran Installation Report • 200207 KI8 Tabuaeran island Council Solar PV System Commissioning _ Sheet • 200207 KI8 Tabuaeran island Council _Acceptance Certificate
Outputs: 1. Solar PV Systems design:	Systems design report available	System design specification available in 2015	System design specification for rural boarding school is adopted by government MoE in 2018	System design specifications have been adopted for rural boarding schools and JSS schools and appear in the survey and design reports for this project.	• 170810 KI8 - ASMC Site Survey Report • 181005 KI8 - Tabuaeran Solar System Design Report • 181204 KI8 - Teraina Island Council and Schools - Solar System Design Report

Description	Indicator	Baseline	Target	Achievement	Means of Verification
2. Procurement and Installation:	Number of hybrid solar PV panels installed and % share of RE.	8 Solar PV hybrid systems installed in 2014	10 Solar PV hybrid systems operating in 2018	9 Solar PV hybrid systems operating in 2018 with the addition of the ASMC 20kW system. 12 Solar PV systems operating by December 2019 with the project adding the following: Tabuaeran – 11 kW Teraina Island Council – 5.5 kW Teraina JSS + primary school – 5.5 kW	• 181122 KI8 – ASMC Installation Report • 200205 KI8 Teraina Island Council Solar PV System Commissioning _Sheet • 202005 KI8 Teraina island council _ Acceptance Certificate • 191115 KI8 – Tabuaeran Installation Report • 200207 KI8 Tabuaeran island Council Solar PV System Commissioning _ Sheet • 200207 KI8 Tabuaeran island Council _Acceptance Certificate
	kWh of solar energy production from the solar systems in the schools.	360kWh average daily solar energy production in 2015 in schools	422kWh average daily solar energy production in 2016 *Equals a total additional production of 62 kWh/day on average in schools*	Achievement was 118 kWh average daily production by November 2019 in schools only. Project had not commenced work until 2017, so 2016 was unrealistic and the target was too low as the ASMC was originally predicted to need a 5-6kW solar system and not the resulting 20kW system, which was designed against the school needs assessment. *So for each ACSE project:* *ASMC – 76kWh/day*	• 170810 KI8 - ASMC Site Survey Report • 181005 KI8 - Tabuaeran Solar System Design Report • 181204 KI8 - Teraina Island Council and Schools - Solar System Design Report • 200117 Teraina Installation Report • 191115 KI8 Tabuaeran Installation Report • 200205 KI8 Teraina Island Council Solar PV System Commissioning Sheet • 200205 KI8 Teraina Island JSS Solar PV System Commissioning Sheet • 200207 KI8 Tabuaeran Island Council Solar PV System Commissioning Sheet

Description	Indicator	Baseline	Target	Achievement	Means of Verification
				Tabuaeran Council + JSS School - 42kWh/day – 50% for school = 21kWh/day *Teraina Council – 21.5kWh/day* *Teraina Schools – 21.5kWh/day* **Grand total:** 76+42+21.5+21.5 = **160kWh/day** **Total – schools only:** 76+21.5+21.5 = **118kWh/day** Based on: KW hours production potential from solar PV systems or System Energy Yields is obtained from: - peak sun hour - system power capacity - system losses	
3. Training:	Number of female and male qualified technicians	1 female & 15 males qualified technicians 2014	10 females & 25 males received formal qualifications by 2018	This training was not achieved as there was no formal training offered for solar technicians through the PACTVET programme in Kiribati.	No PACTVET component developed for solar trainings in Kiribati. PACTVET was never formally integrated with the design of this project.

Description	Indicator	Baseline	Target	Achievement	Means of Verification
	Number of solar energy courses and programmes running.	3 (KIT, PSO, Online IRENA) current solar energy programmes running.	6 Renewable energy - solar programmes running in 2018.		
	Number of men/women mentored by solar technicians to operate each of 4 solar systems installed.	Zero men/women mentored by solar technicians to operate each of 4 solar systems installed.	2 men/1 woman mentored by solar technicians to operate each of 4 solar systems installed.	2 men/zero women mentored by solar technicians to operate each of 4 solar systems installed.	• 181122 KI8 – ASMC Installation Report • 200205 KI8 Teraina Island Council Solar PV System Commissioning _Sheet • 202005 KI8 Teraina island council _ Acceptance Certificate • 191115 KI8 – Tabuaeran Installation Report • 200207 KI8 Tabuaeran island Council Solar PV System Commissioning _ Sheet • 200207 KI8 Tabuaeran island Council _Acceptance Certificate
	Number of trainings in solar energy and energy efficiency systems delivered through workshops	0 trainings at the start Number of trainings in solar energy and energy efficiency systems delivered through workshops	1 training in solar energy and energy efficiency systems delivered through workshops	5 trainings achieved	• 191105 KI8 - Project Trainings Report

Description	Indicator	Baseline	Target	Achievement	Means of Verification
	Number of women trained	0 women trained	20 women trained	61 women trained	• 191105 KI8 - Project Trainings Report
	Number of men trained	0 men trained	20 men trained	44 men trained	• 191105 KI8 - Project Trainings Report
4. **Governance:**	Maintenance and Operations Policy for both schools in place	No maintenance and operations plan in place in 2015	2 Maintenance and Operations plan in place in 2018	1 maintenance and operations plan in place in 2018 for ASMC 3 maintenance and operations plan in place - Tabuaeran JSS/Island Council - Teraina JSS/Primary School Teraina Island Council	• 200107 KI8 – Project Knowledge Products
5. Community Ownership:	ANZ account for sinking fund established Island Council collection of money and deposit into Electricity Revolving Fund	No sinking fund accounts in 2015	2 Sinking fund account create in 2018 one each for ASMC and MTSS	4 sinking funds established One each in ASMC Abemama Island, Tabuaeran Island Council, Teraina Island Council, Teraina JSS and Teraina Primary School	No new account from ASMC however rules established – 100110 KI8 – Rules ASMC Email from Teraina Island Clerk – terainaclerk@internalaffairs.gov.ki dated 15 July 2020 Thank you very much for your concern for the electricity tariff Recently We still have a few collections every month from the School and the Council. The School have deposited to the Council y $80 for the electricity. The Council deposited $148.80 this payment includes the Police Office.
	Number of solar system governance arrangements in place for the target sites by	No solar system governance arrangements were in place for the target sites at the	2 solar system governance arrangements in place for the target sites by the	4 solar system governance arrangements in place for the target sites by the end of the project: 1. ASMC	• 200230 KI8 – Solar Systems Governance Report

Description	Indicator	Baseline	Target	Achievement	Means of Verification
	the end of the project	start of the project	end of the project	2. Tabuaeran JSS + island council 3.Teraina Island Council 4. Teraina JSS + primary school These arrangements are outlined in the Solar Systems Governance Report and respective as outlined in the respective Letters of Agreements.	• 180123 KI8 - Government of Kiribati and ASMC – MoA • 191028 KI8 – LOA Teraina Island Council - Ministries - • 191028 KI8 – LOA Teraina Island Council & Schools • 191031 KI8 – LOA Tabuaeran Island Council – Ministries

4.4 Summary of Project Outputs, Visibility and Validation Products

The table 13 below lists all project outputs including Annex 7 technical reports and validation products to the monitoring and evaluation plan, workshop reports of all kinds, policies, plans, manuals, guidelines, project mid-term and final reports, consultancy reports, construction reports. These are presented in chronological order. Outputs are presented in chronological order. Products not produced by project, but which validate project achievement are presented in *italics*.

Table 13 – Project outputs

Outputs and Validation Products	**M&E Validation**	**Comms. Output**	**Project Output**
141003 KI8 - Concept Note Evaluation			
150519 KI8 - Concept Note Final	X		
151007 Kiribati MOU - GIZ - GOK A			X
151007 Kiribati MOU - GIZ - GOK B			X
151007 Kiribati MOU - SPC_GOK for ACSE			X
160510 KI8 - Project Design Document	X		
160712 KI8 - Financing Agreement - 81202071 - English	X		
160712 KI8 - Financing Agreement - 81202071 - German	X		
160712 KI8 - Special Agreement to FA - 81202071 – English	X		
170117 KII8 - SPC Government of Kiribati - MoA			X
190819 KI8 - Project Variation 1 - Justification Letter			X
190819 KI8 - Project Variation 1 - Proposal			X
191108 KI8 - FA 81202071 - Addendum 2			X
200214 KI8 – FA 81202071 - Addendum 3			X
Project Results and Validation			
161101 KI8 - Annex 7 Technical Report No.1			X
161101 KI8 - Annex 7 Technical Report No.2			X
161107 KI8 - Cost Benefit Analysis – ToR			X
170412 KI8 – Project Article in Pacific Energizer Issue 23		X	
170810 KI8 - ASMC Site Survey Report			X
170202 KI8 - Presentation to Parliamentary Committee		X	
170903 KI8 - ASMC Cost Benefit Analysis Report			X
170903 KI8 - MTSS Cost Benefit Analysis Report			X
170904 KI8 - ASMC + MTSS CBA Presentation			X
171101 KI8 - ASMC Design Mission - ToR			X
171129 KI8 - Annex 7 Technical Report No.3			X
171215 KI8 - St Leo School Rapid Assessments Report			X
180130 KI8 - ASMC Gender and Energy Assessment Report			X
180207 KI8 - Tabuaeran Site Survey Report			X
180219 KI8 - Mid Term Project Review Report			X
180313 KI8 - ASMC Memorandum of Agreement			X
180313 KI8 - Change of Target Schools Letter to GIZ from GoK			X
180319 KI8 - ASMC Request for Proposal to Supply Solar System			X
180320 KI8 - MTSS Gender and Energy Assessment Report			X
180401 KI8 - Island Council and JSS Design Mission - ToR			X
180419 KI8 - ASMC Solar Installation - TOR			X
180511 KI8 - ASMC Supply Contract - Financial Evaluation Report			X

180511 KI8 - ASMC Supply Contract - Technical Evaluation Report			X
180604 KI8 - ASMC Supply Contract - CBS			X
180705 KI8 - Annex 7 Technical Report No.4			X
180705 KI8 - Annex 7 Technical Report No.4 Annexes			X
180105 KI8 – Tabuaeran Site Survey Report			X
180813 KI8 - Island Councils and JSS - Gender Needs and Design Report			X
181001 KI8 - ASMC Solar System Equipment Inspection Report - CBS			X
181005 KI8 - Tabuaeran Solar System Design Report			X
181015 KI8 - Tabuaeran Solar System Installation - TOR			X
181101 KI8 – ASMC Installation Report			X
181101 KI8 - ASMC Acceptance Certificate			X
181101 KI8 - Peer Learning Workshop Report			X
181118 KI8 - ASMC Commission and Handover Media Brief		X	X
181122 KI8 - ASMC Commissioning Media - Kiribati Uekera Issue#47_2018		X	
181122 KI8 - ASMC Commissioning Media - Uekera Issue#47_2018		X	
181204 KI8 - Teraina Island Council and Schools - Solar System Design Report			X
181207 KI8 - ASMC Commissioning Media - Kiribati News Star		X	
190201 KI8 - ASMC Solar System Evaluation - ToR			X
190302 KI8 – Inter-Ministerial Meeting Minutes re Solar System Governance			X
190404 KI8 - Annex 7 Technical Report No.5			X
190404 KI8 - Annex 7 Technical Report No.6			X
190405 KI8 - Teraina Tabuaeran Solar Contract - Technical Evaluation Report			X
190510 KI8 - Teraina Tabuaeran Electrical Systems - Request for Quotation			X
190531 KI8 - Teraina Tabuaeran Solar Supply Contract - Clay Energy			X
190819 KI8 - Project Variation 1 - Justification Letter			X
190819 KI8 - Project Variation 1 - Proposal			X
190901 KI8 – Line Islands Solar Systems Installation & Commissioning- TOR			X
191015 KI8 - Energy Efficiency and System Governance Trainings - ToR			X
191028 KI8 – Line Islands Solar Systems – Ministerial - LoA			X
191028 KI8 – LOA Teraina Island Council - Ministries	X		X
191028 KI8 – LOA Teraina Island Council – Schools	X		
191031 KI8 – LOA Tabuaeran Island Council – Ministries	X		
191105 KI8 TOR JSS Teraina and Tabuaeran Water Improvement Infrastructure			X
191105 KI8 - Project Trainings Report			X
191114 KI8 – LOA SPC, MISE, MIA, MLIPD Tabuaeran and Teraina Island Systems			X
191115 KI8 – Tabuaeran Installation Report			X

200117 KI8 – Teraina Installation Report			X
190901 KI8 – Line Islands Installation and Commissioning ToR			X
190930 KI8 – Annex 7 Technical Report No.7			X
191105 KI8 – Water Infrastructure Installations - ToR			X
200103 – KI8 Electricity Use Rules _ ASMC			X
200107 KI8 – Project Knowledge Products		X	
200205 KI8 Teraina Island council Solar PV System Commissioning Sheet			X
200205 KI8 Teraina Island Schools Solar PV System Commissioning Sheet			X
200205 KI8 – Asset Register Teraina Island Council			X
200205 KI8 – Asset Register Teraina Schools			X
200205 KI8 – Teraina Island Council Acceptance Certificate			X
200205 KI8 – Teraina Schools Acceptance Certificate			X
200207 KI8 - Tabuaeran island Council solar PV System Commissioning Sheet			X
200207 KI8 - Asset Register Tabuaeran Island Council and JSS			X
200207 KI8 –Tabuaeran Island Council Acceptance Certificate			X
200207 KI8 Teraina and Tabuaeran Solar system impacts			X
20030 KI8 Solar Systems Governance Report + LOAs			X
200430 KI8 – Teraina and Tabuaeran Commissioning Stories and Media Brief		X	
200815 KI8 Water Infrastructure Report			X
200831 KI8 Annex 7 Technical Report No. 8			X
200903 KI8 – Final Project Evaluation Report			X
200915 KI8 – Final Project Report			X

4.5 Contribution to ACSE Programme Indicators

Table 14 summarises the contributions of the project to the ACSE Programme Level Indicators. The related validation products are also listed and are included, chronologically, in the list of Annexes.

Table 14 -ACSE programme indicators milestone achievements

	Intervention logic	Objectively verifiable indicators of achievement	Indicator Definition or Remarks	Target	Total Achievement	Results	Validation
General objective	Enhance sustainable livelihoods in Pacific ACP countries (PACPs)	• All PACP countries have improved on their MDGs / Sustainable Development Goals	Yes – improved. Refer to SDGs table.	NA to project reporting	NA to project reporting	NA to project reporting	NA to project reporting
Programme purpose	To strengthen the PACPs' capacity to adapt to the adverse effects of climate change and to enhance their energy security at national, provincial and local/community level, addressing the different impact on men and women	• Number of interventions successfully implemented at national, provincial and local/community level	'Successfully implemented' means that the Intervention has been put in place and validated through appropriate documentation. 1. Gouvernance instruments 2. Water infrastructures 3. Livelihood infrastructures Climate-proofing infrastructures 4. Solar infrastructures	NA to project reporting	NA to project reporting	NA to project reporting	NA to project reporting

			5. Biogas infrastructures 6. RE Institutional infrastructures 7. FAESP - Administrative Systems 8. FAESP - Legislative instruments 9. Coordination/Co operation interventions 10. Gender Balance interventions				
		Increased availability of regional and national technical support (RTSM)	'Increased availability' means there are more technical personnel are registered with RTSM	NA to project reportin g	NA to project reporting	NA to project reporting	NA to project reporting
		Proportion of women and men in climate change decision-making bodies	Not clear	NA to project reportin g	NA to project reporting	NA to project reporting	NA to project reporting
		Number of interventions which promote the involvement of women in climate change adaptation / sustainable energy management processes	'Promoting involvement of women' means measurable actions taken in a project. These may include gender assessment/study and analysis, or workshops/trainings, or establishment of a body with fair participation	3	9	6 (Gender & Energy Need Assessment at ASMC, Teraina Island Council, Teraina JSS, Teraina Primary School, Tabuaeran Island	180130 KI8 - ASMC Gender and Energy Assessment Report 180320 KI8 - MTSS Gender and Energy Assessment Report 180813 KI8 - Island Councils and JSS - Gender Needs and Design Report

			and or carrying out relevant event.			Council, Tabuaeran JSS) 3 Water need and gender assessment for MTSS, Tabuaeran JSS and Teraina JSS.	180320 MTSS Gender and Energy Assessment Report FINAL 200815 KI8 – Water Infrastructure Report
Expected results	**Result 1**: Enabling environment and communities' adaptive capacity to cope with climate change challenges, including gender specific challenges, are enhanced	• At least one CCA project in at least eight PACP implemented by end of 2018	'Implemented' means all on groundwork completed.	Water tanks catchment improved	2 JSS water catchment infrastructure improved	Water tank cutters improved, and water pipes installed, water tank based constructed for two tanks at Tabuaeran JSS	200815 KI8 – Water Infrastructure Report
		At least 75% of national implementation partners on the regional EU-GIZ ACSE steering committee agree that adaptive capacity has been enhanced	'Capacity' means the ability of people, organisations and societies to manage their own sustainable development processes and adapt to climate change. This includes recognising obstacles to development, designing strategies to tackle them,	NA at project level reporting	NA at project level reporting	NA at project level reporting	NA at project level reporting

			and then successfully implementing these. Multilevel approach: Individual competence e.g. trainings, workshops, mentoring Organisational development e.g. policies, plans, establishments of new work unit - REGIONAL, NATIONAL, PROVINCIAL AND VILLAGE LEVEL Development of cooperation and partnerships e.g. commission, bilateral partnership through formal partnership with MoU - ALL LEVEL Development of enabling frameworks e.g. legislations - National Level				
		Number of (new or reviewed) national, provincial and local policies, strategies, plans integrating CCA *	New or reviewed' products 'integrating CCA' means only relevant pre-approved products produced by the projects	NA	NA	NA	NA

		Number of improved water infrastructures linked to the mitigation of and/or adaptation to climate change*	Only infrastructures improved through the projects. 'Intervention' is the establishment of functioning system of the infrastructure. 'Improved' means capacity of supply increased, security of supply enhanced, sustainability of management improved, robustness of design, and sustainability of supply. The result of the improved infrastructure is enhanced adaptation to climate change	1	1	MTSS closed. Rainwater harvesting system installed for Tabuaeran Jnr Secondary School instead.	200815 KI8 – Water Infrastructure Report
		Number of improved food production systems linked to the mitigation of and/or adaptation to climate change	'Improved food production system' means capacity of food production supply increased, security of food production supply enhanced, sustainability of food production management improved, robustness of food product system design, sustainability of food	NA	NA	NA	NA

			production systems supply. The result of the improved infrastructure is enhanced adaptation to climate change				
		Number of climate-proofed infrastructures linked to the mitigation of and/or adaptation to climate change	'Climate- proofed infrastructures' examples are: - Cyclone proofed e.g. Vanuatu. - Australian standard design for cyclone rating for water and solar infrastructures design and house design ; - Longevity of system (durability) in harsh environment e.g. Kiribati; - Seawall and coastal barrier design to withstand sea level rise and storm surge e.g. Tonga	NA	NA	NA	NA

		Number of households and communities benefiting from CCA projects* Household	Benefiting means 'directly benefiting from the impact of the project. Examples:	22	45	MTSS closed. Rainwater harvesting system installed for Tabuaeran Jnr Secondary School instead.	200815 KI8 – Water Infrastructure Report
		Communities	Communities and households impacted by water systems, solar systems, food production systems, sea wall.	2	1		
		Number of interventions successfully replicated at national, provincial and local/community level*	Replication as flagged in the PDD. "Intervention replicated' means replicating existing or past intervention before the project (can be an improved replica) at national, provincial and local/community level. E.g. CK1.	4	1	Water improvement system with new pipes, water tanks infrastructures, new cutters and roofing structures replicated at Tabuaeran JSS. Water improvement materials for Teraina procured and school carpenter to install due to delay in JSS renovation	200815 KI8 – Water Infrastructure Report

		Number of interventions which combine implementation and strengthening of systems for capacity building, planning, public finance management, mainstreaming and country-led coordination* (only projects that have this as a high-level outcome)	'Combine intervention' means intervention with multi-dimensional approach that includes 3 of the 5 components listed above. E.g. TO31 - JNAPP II	NA	NA	NA	NA
		Number of interventions which enhance gender equality. ** Note: sex disaggregated data*	Validation - Gender Products 'Enhance gender equality' means where a project demonstrates an intervention at the activity level on the equality of roles for decision making. E.g. Establishment of gender-neutral decision-making body; Gender assessment influencing infrastructure, policy, plan and legislative design; Trainings/ Workshops/ Consultations	1	3	Gender water assessment at MTSS, Tabuaeran JSS and Teraina JSS.	• 180320 MTSS Gender and Energy Assessment Report FINAL • 200815 KI8 – Water Infrastructure Report
		Number of trainings and people trained in SE/CCA interventions	Number of trainings validated by training reports.	1	0	There is no distinct formal training that took place instead	

			Number of people trained recorded as by product of training.			only mentoring on maintenance of the harvesting system.	
		Number of partnerships established between EU-GIZ ACSE and governments, development partners, regional organisations, and the like.	'Partnerships established' means formal partnership established validated by MoUs, or contracts	6	3	1 MoU 1 MoA 1FA	• 151007 Kiribati MOU - GIZ - GOK A • 160712 KI8 - Financing Agreement – • 170117 KI8 Kiribati MOA SPC_GOK for ACSE
	Result 2: Cost-effectiveness and efficiency of energy systems are improved and dependence on fossil fuels is reduced	At least one SE project in at least seven PACP is implemented by end of 2018	'Implemented' means all on groundwork completed.	1	0	Initial FA extended until 31 August 2020	• 160712 KI8 - Financing Agreement - 81202071 – English • 109819 KI8 – Project Variation 1- Justification Letter • 190819 KI8 Project Variation 1 – Proposal • 191108 KI8 - FA 81202071 - Addendum 2 • 200214 KI8 – FA 81202071 - Addendum 3
		Number of solar infrastructures linked to the development of national renewable energy	'Solar infrastructures' refers to solar systems (hardware infrastructures). Solar infrastructures E.g. solar hybrid system or solar systems.	2	4	1 ASMC School System – 1*20kW Tabuaeran Is Council + JSS System – 1*5kW 1 Teraina Island Council System – 1*10kW	• 181103 KI8 – ASMC Installation Report • 191115 KI8 – Tabuaeran Installation Report • 200117 KI8 Teraina Installation Report • 200205 KI8 Teraina Island council Solar PV System Commissioning Sheet • 200207 KI8 - Tabuaeran island Council solar PV
		Kilowatts			40		

						1 Teraina Primary + JSS System – 1* 5 Kw	System Commissioning Sheet
		Number of biogas infrastructures linked to the development of national renewable energy	'Biogas infrastructures' refers to biogas systems (hardware infrastructures). Biogas infrastructures E.g. biogas system, biomass plant.	NA	NA	NA	NA
		Number of institutional strengthening measures linked to the development of national renewable energy	'Institutional strengthening measures' refers to formal national legislative policy and planning processes and mechanisms.	NA	NA	NA	NA
		The projects contribute to the improvement of regionally agreed energy security indicators (FAESP[4]) using a 2009 baseline+	FAESP 3 - Direct access to modern energy-rural (Definition - Solar. Contribution in KW.)		40		• 181103 KI8 – ASMC Installation Report • 191115 KI8 – Tabuaeran Installation Report • 200117 KI8 – Teraina Installation Report • 200205 KI8 Teraina Island council Solar PV System Commissioning Sheet

[4] The Framework for Action on Energy Security for the Pacific (FAESP), its implementation plan and 36 energy security indicators were developed by the Secretariat of the Pacific Community (SPC) through a consultative process with 14 PACPs, regional agencies and other key stakeholders and were endorsed by 14 PACP Ministers for Energy in 2011. In 2012, SPC compiled the data necessary to calculate the indicators for the baseline year of 2009 and published the 2009 energy security indicators for 14 PACPs (Timor-Leste was the only PACP not included in this process).

							• 200207 KI8 - Tabuaeran island Council solar PV System Commissioning Sheet
			FAESP 15 - Legislative instrument (Defitnition & Contribution- Formal Law, Regulation, Policy, Plans.)		NA	NA	NA
			FAESP 14 - Administrative system (Definition & Contribution - Measurable changes in the governance system. Validation - Report or Agreement showcasing changes)		NA	NA	NA
			FAESP 25 - Increase exposure to RE knowledge (Definition & Contribution- Quantifiable formal engagement processes e.g. training/ workshops/structured community or technician consultations/ on site and field assessment or survey.)		5		• 191215 KI8 - Project Trainings Report • 200107 KI8 – Project Knowledge Products
		Number of households and communities directly	Examples - Directly benefitting e.g.	30	729	As per the Health Population data	

		benefiting from SE projects* Households	communities and households directly receiving renewable energy from the ramifications of enacted legislations, or national energy systems. Communities types - school community, social community as defined by govt.			for Teraina (2018) total number of households is 310, total number of males is 816 and total number of females is 822, a total population of 1638. The school population was 110; 53 girls and 57 boys. Tabuaeran Island Households was 401 with total population of 1951. (data was not sex disaggregated) JSS population, was 135; 68 males and 67 females. The gender assessment report showed ASMC with a population of 40 people, 19 males and 21 females. The number of students was 68 (20170, 38 boys and 30 girls.	• 180130 – KI8 ASMC Gender and Energy Assessment Report • 180813 – KI8 Gender and Energy Needs Assessment – Teraina and Tabuaeran JSS and Island Councils • 181031 KI8 – ASMC Installation Report • 191115 KI8 – Tabuaeran Installation Report • 191115 KI8 – Teraina Installation Report • 200815 KI8 Water Infrastructure Report • 200430 KI8 Teraina and Tabuaeran commissioning Stories and Media Brief
		Communities		2	6	4 school communities -	

						ASMC, Tabuaeran JSS, Teraina JSS, Teraina Primary Sch. (Solar systems installed in schools. Note Teraina JSS & Primary share one system) 2 Island communities - Tabuaeran Is, Teraina Is (Solar systems installed in the island councils)	• 170810 – KI8 ASMC Site Survey Report • 181005 KI8 Tabuaeran Site Survey Report • 181204 KI8 – Teraina Island Council and Schools – Solar System Design Report
		Number of interventions successfully replicated at national, provincial and local/community level*	Replication as flagged in the PDD. Replicating existing or past intervention before the project (can be an improved replica) at national, provincial and local/community level.	2	4	The project is replicating existing design. Solar design already in use by govt. 1 ASMC School System – 1*20kW 1 Tabuaeran Is Council + JSS System – 1*5kW 1 Teraina Island Council System – 1*10kW	

						1 Teraina Primary + JSS System – 1* 5 kW	
		Number of institutions and people covered by respective interventions related to capacity building, planning, and institutional strengthening*	'Interventions related to capacity building, planning, and institutional strengthening measures' refers to formal national legislative policy and planning processes and mechanisms or development of formal training program for institutions.	5	10	8 institutions covered (Kiribati United Church - KUC, ASMC, Ministry of Education, Office of the President, Ministry of Infrastructure and Sustainable Energy, Ministry of Internal Affairs, Tabuaeran Council, Teraina Council - 3 MoUs)	• 180123 KI8 - Government of Kiribati and ASMC – MoA • 191028 KI8 – LOA Teraina Island Council - Ministries - • 191028 KI8 – LOA Teraina Island Council & Schools • 191031 KI8 – LOA Tabuaeran Island Council – Ministries
		Number of interventions which enhance gender equality	Validation - Gender Products Definition: 'Enhance Gender Equality - Where a project demonstrates an intervention at the activity level on the equality of roles for decision making. Examples - Establishment of gender-neutral	2	6	6 Gender & Energy Need Assessment at ASMC, Teraina Island Council, Teraina JSS, Teraina Primary School, Tabuaeran Island Council, Tabuaeran JSS.	• 180130 KI8 - ASMC Gender and Energy Assessment Report • 180320 KI8 - MTSS Gender and Energy Assessment Report • 180813 KI8 - Island Councils and JSS - Gender Needs and Design Report

			decision-making body; Gender assessment influencing infrastructure, policy, plan and legislative design; Trainings/ Workshops/ Consultations			Survey Methodology: Office & Household Survey Note: Butaritari had a rapid site assessment but did not have a proper gender assessment.	
		Number of trainings and people trained in SE/CCA interventions ** Note: sex disaggregated data* *Trainings*		4	5	5 trainings conducted for Energy Efficiencies and Energy Governance at ASMC, Teraina JSS & Prim Sch, Teraina Is Council, Tabuaeran Is Council, Tabuaeran JSS.	• 191215 KI8 - Project Trainings Report
		No. of people trained			105		
		Number of partnerships established between EU-GIZ ACSE and governments, development partners, regional organisations, and the like.	Formal partnership established validated by MoUs, or contracts.	6	7	1 MoU 1 MOA 1 FA 4 LoAs	• 151007 Kiribati MOU - GIZ - GOK A • 160712 KI8 - Financing Agreement - 81202071 - English • 180123 KI8 - Government of Kiribati and ASMC – MoA

							• 191028 KI8 – LOA Teraina Island Council - Ministries - • 191028 KI8 – LOA Teraina Island Council & Schools • 191031 KI8 – LOA Tabuaeran Island Council – Ministries • 191114 KI8 LOA, SPC, MISE, MIA MLIPD Tabuaeran and Teraina Island Systems
	Result 3: Regional and national technical expertise in the field of CCA and SE is created and/or enhanced	Nucleus of pool of regional technical experts (Regional Technical Support Mechanism - RTSM) established and functional		NA to project level reporting	NA to project level reporting	NA to project level reporting	NA to project level reporting

5.0 Learning and Innovation

Learnings in this project were gathered through the mid-term project review, GIZ Peer Learning Workshop and final project evaluation. Reports to all three processes are annexed to this report.

In summary, the project can report the following, but fuller elaboration and learnings are best gained from the respective reports:

5.1 Key Learnings

1. Undertaking detailed gender and energy needs assessments helped ensure we designed a system that fit the needs of the beneficiaries. At ASMC, for example, the PDD forecast a 7kW system, but the assessment revealed that a 20-kW system was closer to the needs of the school
2. The cost-benefit analyses revealed that the cost effectiveness increased, the more beneficiaries the system services. This was due to high design, procurement and installation costs of a 20kW system, thus making the 20 kW systems for the school economically marginal, even when the set-up costs are covered by a donor.
3. SPC was not part of the design phase, so the detailed gender and energy needs assessments were not carried out early and therefore did not informed the original system design. This meant that once that assessment was complete, the design and budget had to be reconfigured, generating considerable workload for the implementation team.
4. Taken together, gender and energy needs assessment, cost benefit analyses detailed technical assessments reports, are powerful tools for the correct sizing and configuration of a solar PV system and its electricity distribution network.
5. The cost of installing energy efficient appliances, to run using the solar power such as LED lights, energy efficient photocopiers/fridges/freezers and other equipment for example, are high. If these equipment's fail, or disappear, they can be difficult to replace on Kiribati's remote islands where access to energy efficient technologies is limited. The project should have designed in some budget early to support the purchase of energy efficient equipment.
6. Replacing a 40-watt fluorescent tube light with a 5-watt LED light is good in theory, but in remote Kiribati communities, they are often difficult to replace, or repair if they fail. Communities therefore still rely on tube lights and other more energy demanding appliances, but they are at least readily available and also much cheaper than LED technology to purchase. Projects need to invest more in helping beneficiaries work out cost effective ways to access LED equipment.
7. Lots of measurement and taking notes collected during the baseline assessment and design surveys by the project team really helped with project implementation. Pictures, measurements of rooms, details of lack of power points etc, positions of where the lights should be installed, all this helped, for instance, when retrofitting or changing of lights, laying electricity cables, selecting circuit breakers or positioning power points and distribution boxes.
8. Baseline missions should take every single opportunity to collect the most detailed information possible given the high cost of the missions and complexity of visiting the remote communities where we work. Detailed preparation work really pays off and makes installation much more straightforward. It also helps with accurate budgeting.
9. Introducing the user pay principal where kwh meters are installed for each household and each island council users is important to the sustainability of the solar home systems.

10. Engage technical expertise and those responsible for installations to carry-out the site survey in particular for roof mounted structures.

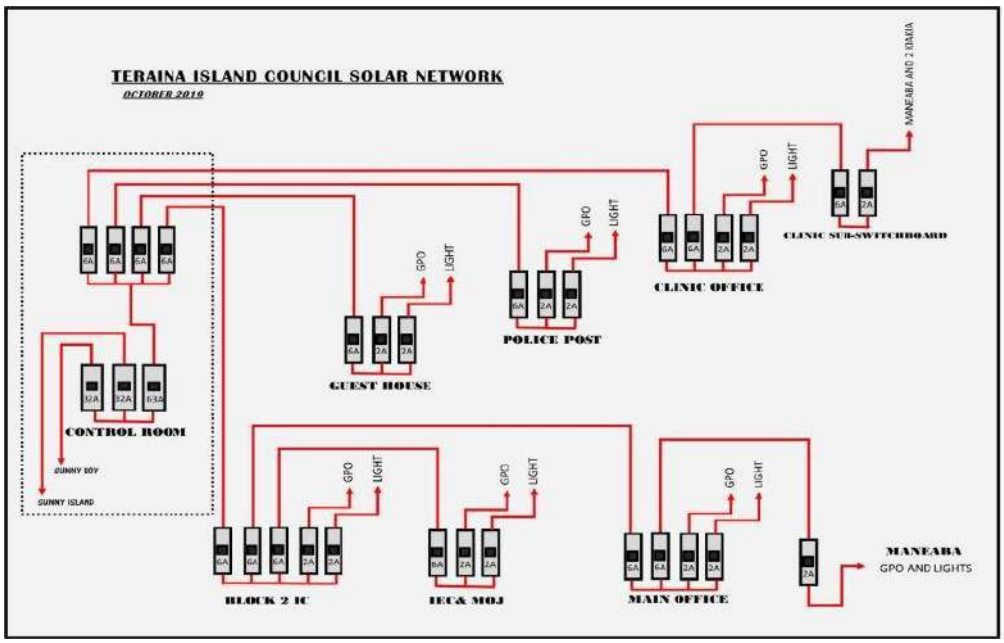
5.2 Best success story

The best success story is the use of planning tools such as gender analysis and cost benefit analysis that has allowed a more realistic sizing of the solar PV hybrid system for the Alfred Sadd Memorial College. These tools support the need to change the project design from a 8kw to a 20kw system. If these tools had not been included, then the project would just be business as usual, straight forward project with the supply of solar PV system as per the project PDD specification but without considering the economics and the gender considerations and thus being sized, and designed to meet the specific needs of the school communities in which we worked. The introduction of the energy efficiency as part of the project is also a successful idea as reducing energy consumption from the demand side technically improved the performance of the solar PV systems and the batteries would also last longer than anticipated.

5.3 Key Innovation

Using strategically placed circuit breakers in the electricity network to cap energy use and to place a focus on energy efficiency practices had never been tried before in Kiribati. The load from households, classrooms and offices were each capped with a 2 amp circuit breaker, main lines into high energy areas, such as computer rooms or printer rooms with a 6 amp circuit breaker, and specifically lines, managed by the administrators, such as maneaba's or the carpenters workshop, with 10 amp circuit breakers.

The breakers were also selected based on careful assessment of the beneficiary energy needs, energy use patterns and in close consultation with them about how they want to manage their energy use. The schematic below is an example of how this innovation was employed in the Teraina Island Council electricity distribution network.



6. Visibility

Table 15 lists the visibility products developed by the project. These are annexed to this report and have been submitted separately to GIZ as part of the project master file. Note that many project outputs also formed part of the visibility actions but are listed elsewhere.

Table 15: Project Visibility Products (include others – if any)

170412 KI8 – Project Article in Pacific Energizer Issue 23
170927 KI8 – Project Article in Pacific Energizer Issue 24
170202 KI8 – ACSE Presentation to Parliamentary Committee
181118 KI8 - ASMC Commission and Handover Media Brief
181122 KI8 - ASMC Commissioning Media - Kiribati Uekera Issue#47_2018
181122 KI8 - ASMC Commissioning Media - Uekera Issue#47_2018
181207 KI8 - ASMC Commissioning Media - Kiribati News Star
200430 KI8 – Teraina and Tabuaeran Commissioning Stories (fb, twitter, Instagram)

7. Annexes

Table 16- Project products listed in chronological order

Annex	**Project Start Up and Management**
1	141003 KI8 - Concept Note Evaluation
2	150519 KI8 - Concept Note Final
3	151007 Kiribati MOU - GIZ - GOK A
4	151007 Kiribati MOU - GIZ - GOK B
5	151007 Kiribati MOU - SPC_GOK for ACSE
6	160510 KI8 - Project Design Document
7	160712 KI8 - Financing Agreement - 81202071 - English
8	160712 KI8 - Financing Agreement - 81202071 - German
9	160712 KI8 - Special Agreement to FA - 81202071 - English
10	170117 KII8 - SPC Government of Kiribati - MoA
11	190819 KI8 - Project Variation 1 - Justification Letter
12	190819 KI8 - Project Variation 1 - Proposal
13	191108 KI8 – Financing Agreement Amendment 2
14	200214 KI8 – Financing Agreement – Amendment 3
15	200828 KI8 - Financing Agreement – Amendment 4
Annex	**Project Results and Validation**
14	161101 KI8 - Annex 7 Technical Report No.1
15	161101 KI8 - Annex 7 Technical Report No.2
16	161107 KI8 - Cost Benefit Analysis – ToR
17	170412 KI8 – Project Article in Pacific Energizer Issue 23
18	170810 KI8 - ASMC Site Survey Report
19	170202 KI8 - Presentation to Parliamentary Committee
20	170903 KI8 - ASMC Cost Benefit Analysis Report
21	170903 KI8 - MTSS Cost Benefit Analysis Report

22	170904 KI8 - ASMC + MTSS CBA Presentation
23	171101 KI8 - ASMC Design Mission - ToR
24	171129 KI8 - Annex 7 Technical Report No.3
25	171215 KI8 - St Leo School Rapid Assessments Report
26	180130 KI8 - ASMC Gender and Energy Assessment Report
27	180207 KI8 - Tabuaeran Site Survey Report
28	180219 KI8 - Mid Term Project Review Report
29	180313 KI8 - ASMC Memorandum of Agreement
30	180313 KI8 - Change of Target Schools Letter to GIZ from GoK
31	180319 KI8 - ASMC Request for Proposal to Supply Solar System
32	180320 KI8 - MTSS Gender and Energy Assessment Report
33	180401 KI8 - Island Council and JSS Design Mission - ToR
34	180419 KI8 - ASMC Solar Installation - TOR
35	180511 KI8 - ASMC Supply Contract - Financial Evaluation Report
36	180511 KI8 - ASMC Supply Contract - Technical Evaluation Report
37	180604 KI8 - ASMC Supply Contract - CBS
38	180705 KI8 - Annex 7 Technical Report No.4
39	180705 KI8 - Annex 7 Technical Report No.4 Annexes
40	180105 KI8 – Tabuaeran Site Survey Report
41	180813 KI8 - Island Councils and JSS - Gender Needs and Design Report
42	181001 KI8 - ASMC Solar System Equipment Inspection Report - CBS
43	181005 KI8 - Tabuaeran Solar System Design Report
44	181015 KI8 - Tabuaeran Solar System Installation - TOR
45	181101 KI8 – ASMC Installation Report
46	181101 KI8 - ASMC Acceptance Certificate
47	181101 KI8 - Peer Learning Workshop Report
48	181118 KI8 - ASMC Commission and Handover Media Brief
49	181122 KI8 - ASMC Commissioning Media - Kiribati Uekera Issue#47_2018
50	181122 KI8 - ASMC Commissioning Media - Uekera Issue#47_2018
51	181204 KI8 - Teraina Island Council and Schools - Solar System Design Report
52	181207 KI8 - ASMC Commissioning Media - Kiribati News Star
53	190201 KI8 - ASMC Solar System Evaluation - ToR
54	190302 KI8 – Inter-Ministerial Meeting Minutes re Solar System Governance
55	190404 KI8 - Annex 7 Technical Report No.5
56	190404 KI8 - Annex 7 Technical Report No.6
57	190405 KI8 - Teraina Tabuaeran Solar Contract - Technical Evaluation Report
58	190510 KI8 - Teraina Tabuaeran Electrical Systems - Request for Quotation
59	190531 KI8 - Teraina Tabuaeran Solar Supply Contract - Clay Energy
60	190819 KI8 - Project Variation 1 - Justification Letter
61	190819 KI8 - Project Variation 1 - Proposal
62	190901 KI8 – Line Islands Solar Systems Installation & Commissioning- TOR
63	191015 KI8 - Energy Efficiency and System Governance Trainings - ToR

64	191028 KI8 – Line Islands Solar Systems – Ministerial - LoA
65	191028 KI8 – LOA Teraina Island Council - Ministries
66	191028 KI8 – LOA Teraina Island Council – Schools
67	191031 KI8 – LOA Tabuaeran Island Council – Ministries
68	191105 KI8 TOR JSS Teraina and Tabuaeran Water Improvement Infrastructure
69	191105 KI8 - Project Trainings Report
70	191114 KI8 – LOA SPC, MISE, MIA, MLIPD Tabuaeran and Teraina Island Systems
71	191115 KI8 – Tabuaeran Installation Report
72	200117 KI8 – Teraina Installation Report
73	190901 KI8 – Line Islands Installation and Commissioning ToR
74	190930 KI8 – Annex 7 Technical Report No.7
75	191105 KI8 – Water Infrastructure Installations - ToR
76	200103 – KI8 Electricity Use Rules _ ASMC
77	200107 KI8 – Project Knowledge Products
78	200205 KI8 Teraina Island council Solar PV System Commissioning Sheet
80	200205 KI8 – Asset Register Teraina Island Council
81	200205 KI8 – Asset Register Teraina Schools
82	200205 KI8 – Teraina Island Council Acceptance Certificate
83	200205 KI8 – Teraina Schools Acceptance Certificate
84	200207 KI8 - Tabuaeran island Council solar PV System Commissioning Sheet
85	200207 KI8 - Asset Register Tabuaeran Island Council and JSS
86	200207 KI8 –Tabuaeran Island Council Acceptance Certificate
87	200207 KI8 Teraina and Tabuaeran Solar system impacts
88	20030 KI8 Solar Systems Governance Report + LOAs
89	200430 KI8 – Teraina and Tabuaeran Commissioning Stories and Media Brief
90	200815 KI8 Water Infrastructure Report
91	200831 KI8 Annex 7 Technical Report No. 8
92	200903 KI8 – Final Project Evaluation Report
93	200915 KI8 – Final Project Report