Annex 4.1 – Logframe matrix

Description	Indicator	Baseline	Target	Means of Verification	Assumptions
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.	National population census report. Regional Framework Energy Security Indicators EPU Energy statistics Year Book School reports project monitoring plan.	
Outcome: Two Solar - Hybrid systems installed, each one sustainably operated and effectively meeting the current and predicted future needs of the respective boarding school communities.	# share of renewable energy increased in secondary schools	7 of renewable energy share use for power generation in rural boarding school in 2014	9 of renewable energy share use in rural boarding schools by 2018	National statistics, EPU energy statistics year book.	Logistics support available Funding availability Technical-capacity available. .
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	Standards for solar PV hybrid system available	Availability of contractors Proper design and standards

			in 2018		
1.1 Communities' consultation meeting – to apply electricity tariff for both schools. 1.2 Develop a TOR for call on proposals for system design including supporting infrastructure (housing, wiring etc), waste management plan, gender analysis, future energy demand and solar/hybrid systems' equipment standard. 1.3 Travel costs including per-diem, accommodation, meals to visit Tabuaeran and Abemama for system designing. 1.4 Contract fee to carryout site survey and designing energy systems for both schools. 1.5 Form a Project Working Group for each island including costs on delivery of meetings. 1.6 Develop a presentation and present options to relevant government bodies including Project Working Group for information and/or approval. 1.7 Develop knowledge management products and distribute to target audiences. 1.8 Adapt solar water pumping system design previously used in Kiribati schools to the MTSS situation (in partnership with MPWS water engineers)					
2. Procurement and Installation:	Number of hybrid solar PV panels installed and % share of RE. kWh of solar energy production from the solar PV hybrid systems in the schools.	8 Solar PV hybrid systems installed in 2014 360kWh average daily solar energy production in 2015	10 Solar PV hybrid systems operating in 2018 422kWh average daily solar energy production in 2016	Project commissioning reports for both schools Energy statistics year book	Power is generated from solar systems. Publications of energy statistics and energy security indicators for Kiribati are developed and published
2.1 Develop a TOR for procurement and installation of solar pv systems in the two schools based on Solar PV System Design (SPC staff) 2.2 Develop a Battery Waste Management Plan (to be included in TOR of contractors) - (SPC staff) 2.3 Develop tendering document - turnkey contract on PROCUREMENT, TRANSPORT PLAN, INSTALLATION , WASTE DISPOSAL PLAN (SPC staff)					

a. MTSS – Tabuaeran Island (Line Group)

2.4a Equipment costs – solar panels, batteries, inverters, mounting posts, grid cables, solar water pump, etc for 16kW including insurance and international freight;

2.5a Local Freight costs to Fanning by boat (LC Te Mauri from Tarawa to Fanning)

2.6a Installation of solar PV system and solar water pumping system - (4 technicians and Project Management staff - Tarawa to Fanning and return (airfare, boat fare transit - estimate number 23 days)

2.7a Local labour costs - construction of mounting of solar panels, construction of water tank stand , 5 labourers to be recruited

2.8a Plant/Tools hire to clear the sites and compact the ground (for solar panels arrays and assist with water well digging, if required)

2.9a Refurbish costs – existing house to be used for equipment storage and monitoring room;

2.10a Contract Fees for installation of solar PV systems including DSA Costs (accommodation, meals, incidental) – 23 days for Tabuaeran)

2.11a Technical Training - Systems operation and management (SPC staff)

2.12a End of Project Workshop and Monitoring (SPC staff)

b. ASMC – Abemama Island (Gilbert Group)

2.4b Equipment costs – replacement of a 7kW diesel genset, solar panels, batteries, inverters, mounting posts, grid cable, etc for a 16kW system including insurance and freight to Tarawa port

2.5b Local freight cost from Tarawa to Abemama by boat

2.6b Installation of solar pv systems - (4 technicians and two Project Management staff - 7 days in Abemama)

2.6b Air fare including accommodation, meals, incidental to install equipment 4 technicians and 2 project management staffs.

2.7b Local labour costs – construction of mounting of solar panels, installing underground power distribution grid and boxes, 5 labourers to be

recruited 2.8b Plant/Tools hire to clear the site and compact the ground for the solar panels arrays and the costs for the trees compensation. 2.9b Refurbish costs to the energy systems equipment storage and control rooms. 2.10b Contract fees for installation of solar PV systems including DSA costs (accommodation, meals, incidental) – 7 days for Abemama Island. 2.11b Workshop and training facilitation (SPC staff)					
3. Training and Community Engagement:	Number of female and male qualified technicians Number of solar energy courses and programmes running.	1 female & 15 males qualified technicians 2014 3 (KIT, PSO, Online IRENA) current solar energy programmes running.	10 females & 25 males received formal qualifications by 2018 6 Renewable energy - solar programmes running in 2018.	Human resource records. PACTVET project progress report Project progress report	PACTVET project input to the project Project implementation Competence to conduct operation and maintenance works.
3.1 Design a Training Plan to be integrated into the Governance and Operational Framework for each school's energy and water system with roles integrated into the technicians contracts (SPC staff) 3.2 Set up a sinking fund account to cater for training needs and maintenance and operations of the system. 3.3 Deliver technical trainings on energy and water efficiency and conservation both for electricity and water uses - back to back to installations and water assessments (SPC staff).					
4. Governance:	Maintenance and Operations Policy for both schools in place	No maintenance and operations plan in place in 2015	Maintenance and Operations plan in place in 2018	Maintenance plan document	Active members of the PWG.

4.1 Establish a Governance Working Group (GWG) to monitor the operations of the systems in terms of tariff settings to staff, expenses and savings and accounts beneficiaries. 4.2 Inception meeting. 4.3 Progress monitoring meeting; 4.4 Review each schools maintenance and operational managements; 4.5 Reflect involvement in this activity in the MOU signed by OB, MoE and each School. Consider involvement of Local Government; 4.6 Develop a simple but comprehensive Energy Governance and Operational Plan for each renewable energy system. This to include maintenance schedule, budget allocations for tariff collections, sinking fund structure and administration, data collection, recording and sharing with MPWU. 4.7 Develop a model plan framework for the EPU to implement in other boarding schools with renewable energy systems.					
5. Community Ownership:	ANZ account for sinking fund established	No sinking fund accounts in 2015	Sinking fund account create in 2018	ANZ Bank statement	Support of school management ANZ rural banking available
5.1 Seek agreement and singing of MOA between Ministry of Education, Schools and the Solar PV systems. 5.2 Engage the Governance Working Group to develop each community engagement plan including budget.					
6. Monitoring and Evaluation:	Monitoring and Evaluation Framework in place	KIIREP monitoring and Evaluation Plan	Project is monitored through M&E Framework	Monitoring and evaluation tracking plan	Partners input to the M&E Framework
6.1 Develop an M&E tracking framework which include the monitoring of students/teachers satisfaction with the new electricity system.					

6.2 Implement and M&E tracking framework – indicators for monitoring outcomes, outputs risks. Knowledge management and communications; 6.3 Develop standard photo points for each school to monitor system installation and 6.4 Develop the cost & benefit analysis of the solar energy systems for both schools.

Annex 4.2 – Stakeholder matrix

Stakeholder name and basic characteristics	Process to engage / consult with stakeholder	Interests in the issue or problem area. How are they affected?	Motivation to bring about change & Capacity to change
Ministries and Non-Government Organizations (MELAD, MoE, MIA, MFED, MPWU, KSEC, KUC). Responsible agencies for management and financial supports to the targeted rural boarding schools. **South Tarawa**	Invitation letter with the concept note attached dispatched to relevant stakeholders 1 week prior to the meeting. Participants discussed further the energy problems, needs and proposed solutions for both schools. A Problem Solution Tree developed.	GoK is heavily depending on fossil fuels for transportation and power needs. Estimated 1/3 of the country total importation expenditures spend on fossil fuels only. The ministries representatives agreed to problems and agreed to the proposed solutions laid out in the concept note. The MoE and KUC are responsible to ensure administration and management systems in the schools are maintained. Schools annual operational budgets endorsed by the MoE and KUC. Operational and maintenance cost for power generating is expensive and cost about AUD$30k per year. Alternative to diesel use and much more affordable power system is	It is the GoK priority need to install the solar/hybrid systems in both schools reflected in the KJIP and as one of the priority areas in the National Energy Policy. MoE and KUC agreed to move away from the conventional use of diesel for the existing power systems in the schools to a more affordable, reliable and efficient power systems such as use of solar energy. About AUD$30k is spent annually on diesel fuel cost. The solar PV hybrid system will dramatically reduce this cost.

		needed to replace the existing gen-sets.	
MTSS & ASCM Schools' Administration & Management:	Directly contacted the school via email. Details of the project including the concept note were sent to the school principal. A self-administered Questionnaire was sent for the school and feedback received. School was informed about the EU-GIZ ACSE programme 2 weeks prior to the school community workshop conducted. Printed hard copies of the concept note papers were distributed to members of the community. One full day workshop conducted in the school meeting hall conducted by the consultant. Students, staff, members of the school board, clerk of the local government and member of the school	Financial management is the key role of the school management team. One of the key problem the schools faced was the prolonged cash shortages due to expensive. diesel fuels used in power generation. Without diesel fuels, the schools cannot generate electricity which is one of the schools need. Due to the isolated localities of the schools, fuels retail selling prices are always inflated and more expensive. In addition, fuels supply is impacted by infrequent shipping scheduled for 3 – 4 times a year in the Line Groups. While operation budget is insufficient, it always remains for the schools to provide funding assistance to the repair and maintenance services required to operationalise the gen-sets. Dependency on diesel use is reduced once the solar hybrid system is operational. Energy saving through energy efficiency conservation will be.	Electricity access is limited to average of 6 hours daily in both schools due to it's the high cost and limited supply of diesel fuel at all times. The existing power system is old and problematic. There were times when gen-set at ASMC school failed operating and the school is without electricity for long period of time. There is a great need for purchase of new gen-set to improve efficiency and stability of the proposed solar PV mini – grid system. MTSS is a government school and has a permanent Tradesman with a trade certificate in mechanic. He is responsible for the ongoing operation and maintenance of the power system in the school. The Tradesman will be able to learn on the job training for operating and maintaining of the solar PV hybrid system. Potential external funding and in-kind assistances provided annually to the schools from the GoK and churches counterparts. The schools administration and management agreed and supported the initiative – installation of the solar/hybrid systems to overcome issues related to diesel fuels unaffordability and unreliability

	community participated in the workshop.	The affordability and reliability of electricity is enhanced with the use of solar energy compared to diesel fuel	in the rural areas.
MTSS & ASMC Schools' Staff:	Staff were involved and participated in the consultation workshop.	Every staffs has different roles in the school but all staffs need to access reliable electricity services to complete their daily duties and tasks effectively and efficiently for the schools. Without electricity, it would be impossible for staffs to access internet, computer photocopy machine etc which are the main daily needs of the staffs (teachers and support staffs), sometimes exams and tests cancel when these services are not available. Female staffs have more commitments compare to male staffs, not only in the classrooms but also in their homes. For women, life is harder without electricity, Other household chores for example cooking, washing can be carried during night time when there is electricity otherwise chores are to be completed before nightfall, resulting in heavy burden and time constraints to try to do all works	Staff are motivated to see the changes related to electricity reliability in the school. Electricity reliability simply means staff can easily complete their individual daily tasks effectively and efficiently. Preparation and delivery of classes would be easier for the teachers without encountering too much difficult without the access to teaching aid (e.g computers) and facilities. Most of the qualified teachers do not prefer to stay and teach in the rural communities where life standard is low compared to the main islands. With this solar/hybrid systems providing reliable 24/7hrs electricity, the qualified education people or teachers will be encouraged to stay and teach in the rural communities. Communication between the schools and the MoE headquarter office on the main island is more efficient through use of internet and computers, thus monthly update reporting to MoE is expected.

		during the day time. Staff at both schools were enthusiastic to see the life styles changes towards a more productive environment with access to reliable electricity, improvement in education standards and attending higher or tertiary levels as an outcomes of the ACSE energy project.	
MTSS & ASCM Schools' Students:	Students were involved and participated in the consultation workshop.	Students at ASMC mentioned the need of reliable 24/7hrs electricity access. Education development is difficult to achieve without reliable electricity, students may not able to complete required assessment tasks and assignments on time due to limited time in the day time. Students are most vulnerable group to unreliable electricity as their time to study and ability to learn more or complete assignment and get better grades is limited due to lack of access to electricity. . Currently electricity generation for both schools was done in timely bases (schedule), from 7am-12am and 7.30pm-10.30pm. Student often find it hard to access	In the past years, students access to reliable electricity has been limited. The ACSE energy project is providing a solution to this problem. Improvement to standard of life through access to 24 hours of electricity and a platform to improving education standards are anticipated positive outcomes which students are looking forward to achieve.

		electricity anytime they need to turn on and charge laptops, charge lamps when is required. There is no access to computers and internet since electricity is not constantly reliable which result in low standards of education in the school.	

Annex 4.3 – Project Alignment to ACSE Objectives and Indicators

TABLE 1: ACSE AND PROJECT OUTCOME ALIGNMENT

ACSE Outcomes	Project Outcomes that are aligned to ACSE Outcomes
Climate Change Adaptation 1. Enabling environment and communities' adaptive capacity to cope with climate change challenges, including gender specific challenges, are enhanced	Not Applicable (NA)
Sustainable Energy 2. Cost-effectiveness and efficiency of energy systems are improved and dependence on fossil fuels is reduced	**Project Outcomes:** Two Solar PV – hybrid systems installed, each one sustainably operated and effectively operated meeting the current and predicted future energy needs/demand of the two rural boarding school and communities

ACSE indicator alignment table

ACSE outcome	ACSE indicators (* = mandatory)	Project Indicators (identify project level indicators that can inform the ACSE indicators.)
1. Enabling environment and communities' adaptive capacity to cope with climate change challenges, including gender specific challenges, are enhanced	CCA project implemented by 2018*	
	National implementation partners' adaptive capacity enhanced*	Not Applicable (NA)
	Number of (new or reviewed) national, provincial and local policies, strategies, plans integrating CCA	Not Applicable (NA)
	Number of improved infrastructure linked to the mitigation of and/or adaptation to climate change	Not Applicable (NA)
	Number of households and communities benefiting from the projects*	Not Applicable (NA)
	Number of interventions successfully replicated at national, provincial and local/community level	Not Applicable (NA)
2. Cost-effectiveness and efficiency of energy systems are improved and dependence on fossil fuels is reduced	SE project implemented by 2018*	Commissioning reports for each solar hybrid system.
	Improvement of regionally agreed energy security indicators (FAESP[4]) using a 2009 baseline+*	Renewable energy share as % daily supply (average out per month) from solar at in ten boarding schools increased.
	Number of households and communities benefiting from the projects*	Two senior boarding schools communities in the outer islands benefited access to reliable energy supply.
	Number of interventions successfully replicated at national, provincial and local/community level	8 Solar PV hybrid systems completed installed in 7 senior boarding schools and 1 village in the rural areas. The project design is to be replicated at the Outer Islands Council Offices.

Annex 4.4 – Risk Management matrix

#	Risk description	Risk Type[5]	Implications & Rating. Likelihood (L) & Impact (I) (1=low;5=high)	Mitigation	Contingency
1	**Operational risks:** Technicians lack the motivation to carry out proper maintenance works on the energy systems.	Social risk Technical risk	If no weekly and monthly operational maintenance services to the power system, energy production will drop. *L=4 & I=3*	Employed school technician on contract bases renew every two years. Renewal of contract base on performances. A Operational and Maintenance Plan/Policy and Schedule to be developed	Recruit a part time qualified technician for system operation and maintenance.
	Vandalism to the solar panels is commonly practiced in rural areas. Often solar panels removed from installation sites where no houses and people live in the area.	Social & Security risks	Causes damage to the solar energy system. The system cannot generate energy without the required number of solar panels. L=1 & I=4	Build community ownership model to engage members of the schools communities' responsible in looking after the systems. Systems are to be mounted properly	MoE to review the systems maintenance and operations management plan in both of the schools.

2	**Inadequate budget for maintenance:** The solar energy systems have a lifetime of 25 years. After the lifetime of the energy systems, solar panels and other major equipment no longer functional and need replacement to new equipment. **Financial securitization of the system**: Income from tariffs and other sources not meeting requirements of O&M and replacement.	Economic & Finance risk Technical risk	If one components of the solar energy system is missing, the whole unit would not operate. No energy production from the system. The operation of the solar system depends on the system individual components. If one component malfunctions, the whole system stops operating. L=2 & I=5	Establish major replacement sinking funds for both schools. Establish and implement a user pay principle with tariffs setting for different energy users Warranty period of the solar equipment and extra spare parts to be included in the tender for equipment supply. Schools to include in annual budget for energy system maintenance and operations including spare parts.	MOE to review the policy management of the fund with the schools. Directly purchase equipment from KSEC. Operations and maintenance routine work to be included in annual budgeting Opportunities for funding proposals to be developed within five years of operation
3	**Technical capacity:** RE technology is a new concept		Takes times to conduct	Incorporate training in the	Hire KSEC or EPU

	in rural areas. Capacity training to operate and maintain the systems is required for the technicians. Including development of training manuals suit to local operators in local language.	Resources risk	O&M services. Improper O&M to the system cause damage to the equipment or life risk to the technician. L=3 & I=3	installation tender as responsibility of the contractor. Develop user friendly training manuals and easy to use and translated in local language Incorporate RE training into MoE and MLHRD training programmes.	personnel for maintenance services and follow up on training. Solar PV system suppliers can provide this manuals and translated into local language
4	**Project logistics:** Boat schedules to Fanning Islands irregular and therefore delivery of equipment on sites may be affected.	Time risk	Project timeframe for completion delay added more costs to the project budget. L=3 & I=4	Inform shipping agencies of proposed timelines of project so aligned with shipping schedule. Include delivery of equipment to sites in the tender document for the contractor responsibility.	Align procurements of equipment's to meet the local boats schedule. Local person responsible for local shipping schedule
5	**Disposal of equipment and materials:** Long term replacement of 25years: Batteries (Waste) management Plan	Environment risk	After 25 years of operation the lifetime of the system major equipment start not operating to their maximum performance and need to replace. Batteries when not properly disposed can contaminate the soil and the	The Contractor to work closely with the Recycling company, LG, MELAD and MPWU to develop a battery disposal management plan.	Apply to Environment Conservation Unit for a Development Consent on the Project that includes Battery waste management Plan. The contractor to include the development of the

			environment. L=2 & I=3		Battery Waste Management Plan in the Solar PV hybrid Designing
6	**Demand Side Management:** Energy demand exceeding supply in the short to medium term.		Without DSM and EE training education to the schools, inefficient uses of energy will result in the system overloading and frequent shutdown. (L-5)	Effective DSM and EE and Energy Conservation training, awareness programme to all users.	This activity is to be delivered as part of the designing, installation and commissioning. EE package to be developed and delivered by PM and other stakeholders who visited the school.

Annex 4.5 – Knowledge management plan

Target Audience	Key message	Product	Timeframe for development	Expected release date	Model(s) of Distribution	Person in Charge	Partners
Development partners & donors:	Kiribati - EU GIZ Sustainable Energy Programme – PV solar hybrid systems for MTSS and ACMC schools.	Documentary 30 minutes	June 2018	August 2018	International donors meetings 15 copies	ICC, PM	OB, MPWU, SPC, GIZ
	EU – GIZ Adaptation to Climate Change & Sustainable Energy Programme (*PV solar hybrid systems for boarding schools in the rural communities*)	Photos journals	March 2017	May 2017	International donors meetings 15 copies	ICC, PM,	SPC, GIZ, OB, MoE, KUC, MPWU
Members of Parliament (MPs):	Green and clean energy for all. (EU – GIZ ACSE Programme)	T-Shirts	March 2016	March 2016	Parliament House	PM	SPC, OB, MPWU
	Affordable and reliable energy enhancing social and economic developments in Kiribati.	Project commissioning reports	Jan 2017	May 2017	Save Energy Day 44 pcs	PM	SPC, MPWU, MoE
Energy Officers:	'Renewable Energy Project – PV solar hybrid systems for boarding schools in the rural communities.	PDD, System design report.	March 2016	July 2016	MPWU drive network and SPC PDRD portal	MPWU IT Officer &SPC IT Officer	SPC, MPWU

Two school communities:	We owned our energy system and we responsible to look after it.	Designed notice board	July 2016	September 2016		PM	SPC, MoE, KUC, MPWU
	Costs & Benefits analysis of Renewable Energy RE (solar power hybrid system) against conventional energy (diesel gen-set power system) presentations	Power point presentations	August 2017	September 2017	Beginning of school terms	MoE Officers	SPC, MoE, KUC, MPWU

Annex 4.6 – Internal communications plan

Stakeholders	Engagement method	Frequency	Responsibility
Implementing Partner:	Skype and emails during and after the Project Team meetings and Sharing of meetings minutes records.	2/month	PM
Politicians or Members of Parliament (MPs):	Deliver project presentation to the parliamentarian one week (consultation week) prior to the house of parliament commence.	2/year	PM, PWG and MPWU Project Officer
Secretaries – OB, MPWU, MoE	Reporting made directly to the secretaries of lined ministries from KNEG members who are senior technical officers.	1/month	ICC, PM
KNEG - Kiribati National Expert Group:	ICC at the OB office participates in the KNEG meeting responsible for providing progress update on the ASCE project activities.	1/month	ICC, PM
MPWU (EPU):	Project Manager's will sit at EPU office and responsible to reports to Energy Planner on the Project update progress and other relevant matters.	1/week	PM
Schools communities:	Project Manager work closely with PWG for each school and provide project update and progress to the groups.	1/2weeks	PM

Annex 4.7 – M&E plan

Description	Indicator	Baseline	Target	Means of Verification	Frequency	Responsibility
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.	National population census report. Regional Framework Energy Security Indicators EPU Energy statistics Year Book School reports project monitoring plan.	1/4 years 1/4years 1/year 1/2weeks	NSO (National Statistics Office) SPC EPU SCHOOLS
Outcome: Two Solar - Hybrid systems installed, each one sustainably operated and effectively meeting the current and predicted future needs of the respective boarding school communities.	# share of renewable energy increased in secondary schools	7% of renewable energy share in rural boarding school in 2014	9% of renewable energy share in rural boarding schools by 2018	National statistics, EPU energy statistics year book.	1/4 years 1/year	NSO EPU
Outputs: 1. Solar PV Systems design:	Systems design report available	System design specification available in 2015	System design specification for rural boarding school is	Standards for solar PV hybrid system available	1/year	CONTRACTOR

			adopted by government MoE in 2018			
1.1 Communities' consultation meeting – to apply electricity tariff for both schools. 1.2 Develop a TOR for call on proposals for system design including supporting infrastructure (housing, wiring etc), waste management plan, gender analysis, future energy demand and solar/hybrid systems' equipment standard. 1.3 Travel costs including per-diem, accommodation, meals to visit Tabuaeran and Abemama for system designing. 1.4 Contract fee to carryout site survey and designing energy systems for both schools. 1.5 Form a Project Working Group for each island including costs on delivery of meetings. 1.6 Develop a presentation and present options to relevant government bodies including Project Working Group for information and/or approval. 1.7 Develop knowledge management products and distribute to target audiences. 1.8 Adapt solar water pumping system design previously used in Kiribati schools to the MTSS situation (in partnership with MPWS water engineers)						
2. Procurement and Installation:	Number of hybrid solar PV panels installed and % share of RE. kWh of solar energy production from the solar PV hybrid systems in the schools.	8 Solar PV hybrid systems installed in 2014 360kWh average daily solar energy production in 2015	10 Solar PV hybrid systems operating in 2018 422kWh average daily solar energy production in 2016	Project commissioning reports for both schools Energy statistics year book	1/year	CONTRACTOR
2.1 Develop a TOR for procurement and installation of solar pv systems in the two schools based on Solar PV System Design (SPC staff)						

2.2 Develop a Battery Waste Management Plan (to be included in TOR of contractors) - (SPC staff)

2.3 Develop tendering document - turnkey contract on PROCUREMENT, TRANSPORT PLAN, INSTALLATION , WASTE DISPOSAL PLAN (SPC staff)

c. MTSS – Tabuaeran Island (Line Group)

2.4a Equipment costs – solar panels, batteries, inverters, mounting posts, grid cables, solar water pump, etc for 16kW including insurance and international freight;

2.5a Local Freight costs to Fanning by boat (LC Te Mauri from Tarawa to Fanning)

2.6a Installation of solar PV system and solar water pumping system - (4 technicians and Project Management staff - Tarawa to Fanning and return (airfare, boat fare transit - estimate number 23 days)

2.7a Local labour costs - construction of mounting of solar panels, construction of water tank stand , 5 labourers to be recruited

2.8a Plant/Tools hire to clear the sites and compact the ground (for solar panels arrays and assist with water well digging, if required)

2.9a Refurbish costs – existing house to be used for equipment storage and monitoring room;

2.10a Contract Fees for installation of solar PV systems including DSA Costs (accommodation, meals, incidental) – 23 days for Tabuaeran)

2.11a Technical Training - Systems operation and management (SPC staff)

2.12a End of Project Workshop and Monitoring (SPC staff)

d. ASMC – Abemama Island (Gilbert Group)

2.4b Equipment costs – replacement of a 7kW diesel genset, solar panels, batteries, inverters, mounting posts, grid cable, etc for a 16kW system including insurance and freight to Tarawa port

2.5b Local freight cost from Tarawa to Abemama by boat

2.6b Installation of solar pv systems - (4 technicians and two Project Management staff - 7 days in Abemama) 2.6b Air fare including accommodation, meals, incidental to install equipment 4 technicians and 2 project management staffs. 2.7b Local labour costs – construction of mounting of solar panels, installing underground power distribution grid and boxes, 5 labourers to be recruited 2.8b Plant/Tools hire to clear the site and compact the ground for the solar panels arrays and the costs for the trees compensation. 2.9b Refurbish costs to the energy systems equipment storage and control rooms. 2.10b Contract fees for installation of solar PV systems including DSA costs (accommodation, meals, incidental) – 7 days for Abemama Island. 2.11b Workshop and training facilitation (SPC staff)						
3. Training:	Number of female and male qualified technicians Number of solar energy courses and programmes running.	1 female & 15 males qualified technicians 2014 3 (KIT, PSO, Online IRENA) current solar energy programmes running.	10 females & 25 males received formal qualifications by 2018 6 Renewable energy - solar programmes running in 2018.	Human resource records. PACTVET project progress report Project progress report	1/year 1/year 1/month	PSO, EPU, KIT, USP, OB, MoE SPC, OB, PSO, MoE, MLHRD PM, CONTRACTOR, SCHOOLS
3.1 Design a Training Plan to be integrated into the Governance and Operational Framework for each school's energy and water system with roles integrated into the technicians contracts (SPC staff) 3.2 Set up a sinking fund account to cater for training needs and maintenance and operations of the system. 3.3 Deliver technical trainings on energy and water efficiency and conservation both for electricity and water uses - back to back to installations and						

water assessments (SPC staff).						
4. **Governance:**	Maintenance and Operations Policy for both schools in place	No maintenance and operations plan in place in 2015	Maintenance and Operations plan in place in 2018	Maintenance plan document	2/year	SPC, PM, SCHOOLS
4.1 Establish a Governance Working Group (GWG) to monitor the operations of the systems in terms of tariff settings to staff, expenses and savings and accounts beneficiaries. 4.2 Inception meeting. 4.3 Progress monitoring meeting; 4.4 Review each schools maintenance and operational managements; 4.5 Reflect involvement in this activity in the MOU signed by OB, MoE and each School. Consider involvement of Local Government; 4.6 Develop a simple but comprehensive Energy Governance and Operational Plan for each renewable energy system. This to include maintenance schedule, budget allocations for tariff collections, sinking fund structure and administration, data collection, recording and sharing with MPWU. 4.7 Develop a model plan framework for the EPU to implement in other boarding schools with renewable energy systems.						
5. Community Ownership:	ANZ account for sinking fund established	No sinking fund accounts in 2015	Sinking fund account create in 2018	ANZ Bank statement	1/6 months	MPWU, MoE, KUC
5.1 Seek agreement and singing of MOA between Ministry of Education, Schools and the Solar PV systems. 5.2 Engage the Governance Working Group to develop each community engagement plan including budget.						
Activities:						
Risks: Land and sea transportation for	Transportation plan			Work program	1/week	SPC, PWG,PM,

equipment delivery to schools sites.	developed and implemented.			develop and share by the Contractor		SCHOOLS
Development of knowledge management products	Work program to develop K&M products			Work program develop and share by the Contractor	1/week	SPC, PWG, PM, OB
Installation of solar energy systems for both schools.	Work program to install sola PV hybrid systems in both schools			Work program develop and share by the Contractor	1/week	SPC, PWG, PM, SCHOOLS
Stakeholders communication is maintained	External and internal project communication plan in place			Work program develop and share by the PM	1/Week	SPC, PWG, PM, SCHOOLS
Cost & Benefit Analysis	Completed for both schools			Influences TOR for design	TBC	SPC, ICC, PM