MINUTES OF MEETINGS
BETWEEN
THE JAPAN INTERNATIONAL COOPERATION AGENCY
AND
RURAL ELECTRIFICATION AUTHORITY AND MINISTRY OF ENERGY AND PETROLEUM
ON
JAPANESE TECHNICAL COOPERATION
FOR
THE PROJECT FOR ESTABLISHMENT OF RURAL ELECTRIFICATION MODEL USING RENEWABLE ENERGY

The Japanese Terminal Evaluation Team (hereinafter referred to as "the Team"), organized by the Japan International Cooperation Agency (hereinafter referred to as "JICA"), headed by Mr. Tadayuki Ogawa, the Senior Advisor in the field of Energy and Mining, JICA, conducted a survey from 1 to 14 October 2014 for THE PROJECT FOR ESTABLISHMENT OF RURAL ELECTRIFICATION MODEL USING RENEWABLE ENERGY (hereinafter referred to as "the Project").

During the survey, the Team had a series of discussions with the concerned parties of the Government of the Republic of Kenya (hereinafter referred to as "the Kenyan side"), jointly evaluated the achievements of the Project, and exchanged views for further improvement of the Project.

As a result of the discussions, both the Kenyan side and the Team agreed upon the matters referred to in the Joint Terminal Evaluation Report attached hereto and agreed on taking necessary action stated under Attachment.

Nairobi, 14 October 2014

Mr. Tadayuki Ogawa
Team Leader
Terminal Evaluation Team
Japan International Cooperation Agency (JICA)

Eng. Joseph Njoroge
Principal Secretary
Ministry of Energy and Petroleum (MoE&P)
The Republic of Kenya

Mr. Ng'ang'a Mumyu
Chief Executive Officer
Rural Electrification Authority (REA)
The Republic of Kenya

ATTACHMENT

1. **Taking action in accordance with the recommendations made in the Joint Terminal Evaluation Report**
   Both sides agreed to take action in accordance with the recommendations made in the Joint Terminal Evaluation Report attached in Appendix 1.

2. **Signing of Memorandum of Understanding (MoU) on Operation and Maintenance (O&M) of solar PV systems (inclusive of the 10 pilot sites of the Project)**
   Both sides agreed that the REA/MoE&P shall make the best effort to sign MoU among REA/County Governments and/or MoH and REA/Ministry of Education, Science and Technology (MoEST) respectively by the end of December 2014 in order to clarify responsibilities of each party for securing necessary budget for O&M of solar PV systems.
   With regard to MoEST's institutional framework for O&M, an option such as giving a stronger facilitator role to County Education Offices may be considered. The Offices could then effectively link the solar PV-installed schools and MoEST when the schools are in need of financial resources for solar PV O&M.

3. **Dissemination of the established models (Financial/O&M/Technical model)**
   REA and MoE&P shall be responsible for managing the established models and applying them into future solar PV projects in Kenya. In case of transformation of REA into the National Electrification and Renewable Energy Authority (NERA), REA and MoE&P shall hand over the models to the newly appointed person(s)/department(s) in charge of solar PV electrification.

4. **Application of the models to the Rural Electrification Master Plan (REMP) and other related policies**
   Both sides acknowledged that the established models, if deemed effective in the Project Completion Report, shall be incorporated into the Rural Electrification Master Plan (REMP) and other related policies at the time of updating. Potential scope of application of the models, number of prospective project sites and projected annual O&M cost shall also be reflected in the policies.

Appendix 1: Joint Terminal Evaluation Report

Appendix 1

JOINT TERMINAL EVALUATION REPORT ON THE PROJECT FOR ESTABLISHMENT OF RURAL ELECTRIFICATION MODEL USING RENEWABLE ENERGY

Nairobi, 14 October 2014

Ministry of Energy and Petroleum (MoE&P)

Rural Electrification Authority (REA)

and

Japan International Cooperation Agency (JICA)

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Abbreviation/ Acronyms

AFD	French Agency for Development
BRIGHT Project	Project for Capacity Development for Promoting Rural Electrification Using Renewable Energy
C/P	Counterpart
DAC	Development Assistance Committee
DC	Direct Current
EAC	East African Community
F/S	Feasibility Study
GIS	Geographical Information System
JICA	Japan International Cooperation Agency
JKUAT	Jomo Kenyatta University of Agriculture and Technology
KSh.	Kenya Shilling
M/M	Man Month
MHP	Micro HydroPower
MoE&P	Ministry of Energy and Petroleum
MoEST	Ministry of Education, Science and Technology
MoH	Ministry of Health
MOU	Memorandum of Understanding
O&M	Operation and Maintenance
ODA	Official Development Assistance
OECD	Organisation for Economic Cooperation and Development
OJT	On-the-Job Training
PDM	Project Design Matrix
PV	Photovoltaic
R/D	Record of Discussion
REA	Rural Electrification Authority
REMP	Rural Electrification Master Plan
UNIDO	United Nations Industrial Development Organization
USD	United States Dollar
WG	Working Group

Summary of Evaluation

I. Outline of the Project		
Country: Republic of Kenya		Project title: The Project for Establishment of Rural Electrification Model Using Renewable Energy
Issue/Sector: Energy		Cooperation scheme: Technical Cooperation Project
Division in charge: Industrial Development and Public Policy Department		Total cost: Approx. 290.1 million yen (as of March 2013)
Period of Cooperation	(R/D) October 2011 March 2012 – February 2015 (3 years)	Partner Country's Implementing Organization: Ministry of Energy and Petroleum (MoE&P), Rural Electrification Authority (REA)
		Supporting Organization in Japan: Nippon Koei etc.
Related Cooperation: Capacity Development for Promoting Rural Electrification Using Renewable Energy (BRIGHT Project) (2011-2015)		

1. Background

The government of Kenya has been actively working on the enhancement of electric power supply aiming for the stable and balanced economic foundation as well as poverty reduction. Ministry of Energy and Petroleum (MoE&P) has been in charge of the energy sector in Kenya and the Rural Electrification Authority (REA) was established under section 66 of the Energy Act No. 12 of 2006 and became operational in July 2007. REA's mandate, vision and mission are aligned with the national development plan such as Vision 2030. Vision 2030 is designed as a vehicle for accelerating the transformation of the country into an industrialized middle income nation. To achieve this goal, electricity has been identified as one of the drivers where it is expected to achieve 100% electrification rate by 2030.

Regarding the rural electrification, Rural Electrification Master Plan (REMP) has been prepared and updated to attain its goal; 40% of rural electrification rate by 2020 which was below 10% in 2009. Trading centers, secondary schools, health centers are prioritized as important public facilities under REMP, so the electrification rate of those facilities has improved from 10% (2003) to 89% (June, 2013). As a rolling plan of REMP, REA strategic plan has been prepared and updated every 5 years. The latest plan (REA strategic plan 2013/2014-2017/2018) as well as new energy policy by MoE&P clearly states the focus on the utilization of renewable energy. Additionally, in order to promote the decentralization policy under the new constitution (2010), the function of central government is expected to focus on the national level policy formulation, while the county government will be responsible for the planning and implementation of each project.

Therefore, both MoE&P and REA recognized the need for establishment of the rural electrification model by renewable energy to meet these national demands and requested a technical cooperation to Japan International Cooperation Agency (JICA). In response to the request, The Project for Establishment of Rural Electrification Model Using Renewable Energy started in March 2012 for the three-year cooperation period.

2. Project Overview

(1) Overall Goal

Rural electrification models using renewable energy are disseminated in the country to improve the quality of Kenyan's life.

(2) Project Purpose

Rural electrification models using renewable energy are established.

(3) Outputs

1) A practical model for photovoltaic (PV) electrification of health service institutions in nonelectrified areas is developed through pilot projects.
2) A practical model for PV electrification of schools in nonelectrified areas is developed through pilot projects.
3) The Capacity of REA / MoE&P to undertake project using Micro HydroPower (MHP), Biogas and Wind technologies is enhanced.
4) Necessary policy and institutional frameworks for rural electrification using renewable energy are recommended.

(4) Inputs

Japanese side:

Short-term Expert: 11 (90.96M/M) Trainee received: 3 trainees (in Japan),7 trainees (in Third Countries: India and Thailand)	Equipment: 2,119,484 KSh. (2.5 million yen Local cost: 51,642,688KSh. (62.1 million yen)

Kenyan side:

Counterpart personnel (C/P): 19 Land and facilities: An office space including desks, chairs, a lockable cabinet, electricity, water, drinking water and tea	Local cost: 2,360,404KSh. (2.8 million yen)

II. Evaluation Team

Members of Evaluation Team

The Japanese side

Mr. Tadayuki Ogawa	Leader/ Rural electrification	Senior Advisor, JICA
Ms. Yuki Masuya	Evaluation planning	Energy and Mining Group, Industrial Development and Public Policy Department, JICA
Dr. Kumiko Shuto	Evaluation analysis	Senior Consultant, IMG Inc.

The Kenyan side

Ms. Judith Kimeu	Assistant Engineer, Renewable Energy Department, REA
Mr. Hannington Gochi	Senior Technician, Renewable Energy Department, REA

Period of Evaluation	September 30 – October 14, 2014	Type of Evaluation: Terminal Evaluation

III. Results of Evaluation

1. Project Performance

1-1. Inputs

Inputs both from the Kenyan and Japanese sides are provided basically as planned. Among the inputs provided, the distance between the project office and REA/MoE&P has caused inefficiency to a high degree. Although the number of the C/Ps increased substantially compared with the situation at the beginning, their limited availability for project activities, due to their other duties, has hampered effective technical transfer from the Experts.

1-2. Outputs

(1) Output 1 (solar PV model at dispensaries)

Output 1 is judged to be achieved to some degree at present and many of the activities for achieving this output, such as further monitoring, synthesizing monitoring results, finalizing financial analysis, developing guidelines/user manuals and, finally, completing the models are still ongoing. Furthermore, there is still a certain level of uncertainty with regard to nationwide applicability of O&M of the solar PV systems. More efforts to ensure sustainable O&M models of the solar PV systems, particularly financial and institutional arrangements, need to be made in the remaining implementation period.

(2) Output 2 (solar PV model at schools)

The achievement of Output 2 is basically the same as that of Output 1. Output 2, however, has more challenges than Output 1 in terms of institutional and financial arrangements of sustainable O&M of solar PV systems since involvement of Ministry of Education, Science and Technology (MoEST) in establishing the O&M mechanism is still nascent.

(3) Output 3 (capacity development on MHP, biogas and wind technologies)

Output 3 is expected to be achieved to some degree if the ongoing activities, such as the preparation of guidelines and documentation/ presentation of Simple Pre- Feasibility Study (F/S), are completed as planned. Since the pilot projects for Output 3 were cancelled toward the end of the first year of the project period, most of the C/Ps had little chance to practice what they have learned in trainings. The C/Ps' more active participation is needed in the ongoing activities for Output 3 so that their practical knowledge will improve in the remaining project period.

(3) Output 4 (recommendation on policy and institutional frameworks)

Output 4 is expected to be achieved to a relatively high degree if the remaining activities, such as holding the International Workshop and proposition of recommendations are completed as planned. On the other hand, whether or not the Project can present truly effective and realistic recommendations depends largely on successful production of Output 1 through 3. The Experts are now preparing

recommendations based on findings from the three Outputs. Close discussions with the C/P institutions need to be undertaken in order to produce truly useful recommendations.

1-3. Achievement of Project Purpose

The Project Purpose is achieved to some degree at present. If unfinished activities are conducted successfully, the achievement level is expected to be relatively high at the end of the project period. Successful completion of all the activities for the four Outputs with full participation from the C/Ps is required to attain a high level of achievement.

1-4. Implementation process

<Positive factors>

(1) Collaboration with JKUAT and the BRIGHT Project

The C/Ps and staff of County Offices of the MoH have been attending and/or making presentations at various seminars and trainings organized by the JKUAT and/or JICA's technical cooperation project "The Project for Capacity Development for Promoting Rural Electrification Using Renewable Energy (the BRIGHT Project)". Such collaboration with JKUAT and the BRIGHT Project is contributing to raising efficiency of the Project.

<Challenges>

(1) Demanding work volume of the C/Ps

Demanding work volume of the C/Ps outside the Project, such as work for diesel power generation, has been impeding effective and efficient technical transfer from the Experts to C/Ps. In particular, the C/Ps have been having a hard time finding time to go to the pilot sites (for Output 1 and 2) and pre F/S sites (for Output 3). Hence much of the field activities, particularly activities for Output 1 and 2, have been conducted by the Expert Team alone, without much participation from the C/Ps.

(2) Inconvenient location of the project office

The project office is located far from REA/ MoE&P, making the Experts and C/Ps difficult to see each other in person. This physical distance inhibits smooth project operation to a significant degree.

(3) Effects of rapid grid extension in Kenya

REA has been vigorously extending electrical grids to non-electrified areas in Kenya. The sites extended by grid, by nature, often overlap with the Project's potential and existing solar PV pilot sites. In fact, the Project had to re-select the pilot sites for Lot 2 several times since it became apparent the area would be soon covered by grid extension plans. It took much longer time for the Project to finalize its selection of the pilot sites, particularly for Lot 2.

(4) Time spent for planning collaboration with UNIDO

In the first year of the Project, the Project Team spent about nine months planning the details of collaboration with UNIDO. The collaboration was planned to facilitate pilot activities of MHP, biogas and wind power, which was for Output 3. However, after research, it was realized that such collaboration would not be effective and a decision was made to cancel the plan. The Project had to modify the plan for Output 3 substantially and the time spent for planning since the commencement of the Project was wasted to a large extent.

(5) Transition to the County System in Kenya

Kenya has seen a transition to the County System in the last few years. The roles and responsibilities of the central government and county governments dramatically changed particularly in mid to late 2013 (for Output 1). This change has caused the Project to spend a lot time for coordination with both national and sub-national stakeholders with regard to the O&M of the pilot solar PV systems.

(6) Poor performance of solar PV systems installers contracted by the Project

The level of skills and techniques of local solar PV systems installers contracted by the Project was much lower than anticipated. The solar PV systems at the pilot sites are facing repeated technical and mechanical troubles which need to be rectified frequently by the Project. The Project Team has to spend such a long time shooting troubles in the fields that some of the work that needs to be done in Nairobi is being delayed.

(7) Remoteness of the pilot sites of Lot 2

The Project had to select pilot sites for Lot 2 which were far in the distance from Nairobi because there was no other choice. The selection was appropriate considering typical areas where off-grid electrification systems operate. However, the sites have security issues and require a long travel time. It is not possible for the Experts and C/Ps to visit the sites often within the limited timeframe of the Project, which in turn hampers technical transfer activities for Output 1 and 2.

(8) Heavy workload of the C/Ps for the Laptop Program

The C/Ps' work volume for the Kenyan Government's Laptop Program has become increasingly large since around April 2014. The time they can spend for project activities has become even less than before.

2. Summary of Evaluation Results

(1) Relevance

Relevance is relatively high. The project is well aligned with Kenya's development priority as well as with Japan's ODA policy towards Kenya. The project is also appropriately responding to the needs of

the target group, especially the needs of those public facilities in nonelectrified areas by mobilizing Japan's comparative advantage of expertise in renewable energy, community participation, O&M, and business analysis. On the other hand, Kenya has been seeing rapid grid extension in recent years and some of the sites selected for the pilot project have become covered by such an extension. Such a situation could have been avoided if strategic and systematic planning on rural electrification had been in place at REA/MoE&P before the commencement of the Project.

(2) Effectiveness

Effectiveness is fair at present. Although the project purpose is expected to be achieved to a relatively high degree by the end of the planned period, there is still uncertainty regarding the achievements of all the Outputs, from Output 1 through 4. If ongoing activities are completed smoothly and effectively and the concerned institutions take action in accordance with the recommendations to the Project specified in this report, effectiveness is expected to be higher at the completion of the Project.

(3) Efficiency

Efficiency is fair. Inputs from both Japanese and Kenyan sides are basically provided as planned. However, the C/Ps, having many other duties, are not able to spend sufficient amount of time for project activities especially before the Mid-term Review, hence lowering the level of technical transfer from the Experts to the C/Ps. The plan for pilot projects at industrial facilities was cancelled in the first year and it took time to rearrange the project framework. Various key activities were delayed due to reasons such as solar PV pilot site re-identification to avoid grid extension, system troubles at solar PV systems and Lot 2 being in a remote area. Furthermore, Kenya's transition to the County System around mid-2013 required time to identify stakeholders and their roles and responsibilities regarding O&M of solar PV systems. On the other hand, collaboration with the JKUAT and BRIGHT Project is contributing to raised efficiency to a certain extent.

(4) Impact

Impact is fair. The achievement level of the Overall Goal will largely depend on that of the Project Purpose. It will also depend on the practicality and replicability of the electrification models to be finalized in the remaining project period. Since there is a certain level of uncertainty regarding the achievement of the Project Purpose at the moment, the Overall Goal is also subject to uncertainty. Positive impacts of the Project are: (1) Stakeholders of renewable energy technologies increased their awareness regarding the high O&M cost and (2) It is likely that REA will discuss O&M issues with potential facility owners/users in future implementation of systems instalment. There are also impacts at the community-level which improved daily lives of the community members after the installation of solar PV systems at the pilot sites. For instance, personal security of female pupils and staff has

improved with lighting at evening and night time. The community members, particularly women and children, are now enjoying improved public health services such as being provided better care during deliveries at night and getting immunizations at local dispensaries. On the other hand, REA could not adopt some specifications suggested by the Project regarding the solar PV systems design for the Laptop Program due to time constraints, which, if realized, would have been a remarkable impact affecting as many as 3,000 primary schools in Kenya.

(5) Sustainability

Sustainability is fair. Presently, the level of policy and institutional sustainability is difficult to judge since REA is planned to be transformed into the National Electrification and Renewable Energy Authority (NERA). However, if the suggestions from the Project are incorporated into the current policies on renewable energy in future, policy sustainability will be high. The roles and responsibilities regarding the O&M of solar PV systems need to be further clarified and ensured among the national and county governments for better institutional sustainability. Technical sustainability is facing challenges because the C/Ps' practical skills have room for improvement compared with their theoretical knowledge in all four renewable energy technologies. Financial sustainability also needs to be improved, particularly for the appropriate O&M of solar PV systems, since the governments' budgets for pushing forward model dissemination is yet to be secured.

3. Factors that promoted realization of effects

(1) Factors concerning the planning

N/A

(2) Factors concerning the implementation process

N/A

4. Factors that impeded realization of effects

(1) Factors concerning the planning

N/A

(2) Factors concerning the implementation process

All the negative factors listed in "1-4. Implementation process" have impeded realization of effects in some way or other throughout the project period.

5. Conclusion

At the time of the Terminal Evaluation, the achievement level of the Project Purpose was fair.

However, the achievement level will be higher if the remaining activities are completed successfully without delay in the remaining project period and appropriate action is taken in accordance with the recommendations proposed in this report.

The Project Team has been conducting planned activities despite the challenges of multiple adversities which contributed to lowering efficiency. There are still many issues to be addressed in the remaining implementation period until the Project can present practical and sustainable models. In particular, presenting optimal O&M mechanisms of solar PV systems requires obtaining understandings and agreement from relevant organizations. The Project will then need to give effective recommendations to C/P organizations, which should be authorized and endorsed, so that the models will take root at the C/P organizations. If these issues are addressed properly, the achievement level of the Project Purpose will be much higher.

The Project is advised to take action explained above as well as to follow recommendations presented in the next section. The Project should be completed in February 2015 as originally planned.

6. Recommendations

Recommendation to the Project (To be addressed in the remaining project period)

(1) Ensuring sustainability by establishing the O&M models

The Project should continue discussing the O&M models of solar PV systems with relevant institutions including MoH, MoEST, county governments and so forth so as to ensure sustainability of the solar PV systems. Having high-level dialogues and then entering into MOUs with relevant institutions is strongly recommended since it would officially promise institutional and financial commitment to the O&M models. Providing quantitative data on projected annual O&M cost, both total and itemized, by the Project to the prospective signees of the MOUs would facilitate informed decision-making at the signees' sides.

With regard to MoEST's institutional framework for O&M, an option such as giving a stronger facilitator role to County Education Offices is to be considered. The Offices could then effectively link the solar PV-installed schools and MoEST when the schools are in need of financial resources for solar PV O&M.

Furthermore, appropriate management and handling of cash generated from the battery charging business needs to be discussed in order to prevent possible misconduct at the facilities.

The proposed O&M models, on the other hand, should be authorized by the C/P organizations. Departments/persons responsible for continuous improvement of the models should also be identified and appointed.

(2) Conducting and presenting a quantitative analysis on applicability of the models

A quantitative analysis on applicability of the proposed models is recommended to be conducted and

presented to REA/MoE&P. It is beneficial for the C/P organizations to be equipped with quantitative information on, but not limited to, (1) a projected scope of applicability of the proposed models to their future rural electrification plans, (2) the estimated number of applicable cases, and (3) required O&M costs. When conducting the quantitative analysis, site-selection criteria for battery charging stations need to be clarified also. Thus, the Project is advised to build upon its knowledge acquired through its experience on the pilot activities and propose most appropriate criteria.

(3) Formulating realistic policy recommendations

In order to complete the work for Output 4, which is about proposing recommendations on policy and institutional frameworks for rural electrification using renewable energy, the Project is advised to have close dialogues with relevant institutions regarding the proposed solar PV models. The Project, then, should formulate realistic policy recommendations and garner support for their implementation by the concerned institutions. It is important to facilitate active adoption of the proposed models by REA in future. Therefore, if the models are deemed effective in the Project Completion Report, application of the models is advised to be specified in REA's "Annual Renewable Energy Work Programme (Performance Contract)" as well as in Rural Electrification Master Plan (REMP) at the time of updating. The Project and REA are encouraged to work on this issue before the Project terminates.

(4) Working on intensive technical transfer with strong participation from the C/Ps

In order to fill the knowledge/skills gap, it is advised that the technical transfer from the Experts to C/Ps be undertaken actively during the remaining project period. Strong participation from the C/Ps in such activities is key for attaining satisfactory levels of technical transfer in each field of renewable energy technology. The C/Ps' participation includes, but not limited to, preparation and presentation of papers for the International Workshop to be held in February next year.

(5) Recording the achievements of the Objectively Verifiable Indicators, challenges and recommendations

At the time of the Terminal Evaluation, some of the key Objectively Verifiable Indicators in PDM have not reached their targets. They are expected to be attained in the next few months as the Project progresses. When writing the Project Completion Report to be submitted in February 2015, the achievement levels of those indicators should be clearly written so that an objective judgment of project performance can be made easily. Furthermore, remaining challenges and measures to be taken for raising sustainability should be discussed with the C/P and other related organizations and the results of the discussions should be delineated in the Project Completion Report.

Recommendation to the C/P institutions (To be addressed as medium- to long-term measures)

(1) Utilizing and improving the proposed models continuously

The C/P organizations are recommended to continue utilizing and improving the solar PV models proposed by the Project. Assignment of the departments/persons responsible for the coordination with relevant institutions is also recommended to make an institutional effort to improve the models.

(2) Utilizing and revising the guidelines continuously

As for MHP, biogas and wind technologies, pilot project implementation was cancelled in the first year of the project period. Thus, the C/Ps did not have a chance to experience the whole cycle of planning, analysis, system designing, installation and monitoring which are necessary for carrying out activities on the ground. The Project, instead, gave intensive training to the C/Ps and guidelines are being developed for future use. It is strongly recommended that the C/Ps will build on their training experience in the Project and leverage their increased knowledge in actual implementation of MHP, biogas and wind technologies in the field. In doing so, utilizing and revising the guidelines, including one on solar PV systems, should be conducted continuously. REA should be responsible for revising and updating the guidelines.

(3) Improving database on the Rural Electrification Master Plan (REMP)

Current database for the REMP needs to be improved making use of Geographical Information System (GIS). The improvement will help relevant organizations including development partners avoid duplication or overlap of future project sites. It will also facilitate easier decision-making concerning locations of future development.

(4) Exchanging knowledge and human resources with JKUAT

REA's and MoE&P's knowledge sharing and exchange with JKUAT have been proved to be beneficial. Continuous exchange of knowledge and human resources with JKUAT is advisable for strengthening capacity on renewable energy technology at REA and MoE&P. Such knowledge exchange includes, but not limited to, sharing REA's guidelines and other documents produced by the Project so that JKUAT can utilize them in their training courses. With regard to JKUAT's trainings on solar PV systems, regular attendance to such trainings by MoH, MoEST, and County Governments should be ensured.

(5) Improving basic skills for installation work of electrical facilities

It has been observed that the quality of basic installation work for wiring, switches, breakers, etc. was rather low. Thus, the responsible Expert became fully occupied with fixing those poor installations. Without the supervision of the Experts, most solar PV systems installed by local contractors may soon experience faults and malfunctions. In order to improve the quality of basic installation works, it is important for REA to compile detailed appropriate designs and rigorously supervise/ inspect the

contractors' job accordingly.

7. Lessons learnt

(1) Taking appropriate measures to minimize negative factors before and during the Project

There is no doubt that the current delay in producing sufficient outputs is largely attributable to many negative factors. There are as many as eight factors, both internal and external, which have been negatively influencing the Project throughout the implementation period. The project implementers should have made more efforts to identify and tackle these critical issues both before and during the project period so that unfavourable ramifications would be minimized. In some cases, drastic modifications on project design and modalities, including revision in project scope and change in the mode of expert dispatch, to name a few, could have been considered so as to best address major issues.

1. Introduction

1.1. Objective of the evaluation study

Two and a half years have passed since the inception of the Project for Establishment of Rural Electrification Model Using Renewable Energy (hereinafter referred to as "Project").The Project is scheduled to be completed in six months, i.e. in February 2015. The Project Team has been undertaking a range of activities in order to achieve the project purpose. It is important for the concerned authorities to review its progress made thus far and to examine to what extent the activities have led to producing expected outputs, thereby leading to the attainment of the project purpose. The examination will make it possible to judge the level of Project's success. It will also predict how much the Project is likely to achieve the overall goal several years after the project period.

The purpose of the terminal evaluation is to objectively evaluate the level of success of the Project and to identify the reasons behind it. Based on the results of the evaluation, the study is to give suggestions and recommendations to the concerned organizations with the aim of providing lessons learnt which will be useful for future direction of the Project and also for similar projects.

1.2. Members of the evaluation team

The study team is composed of the following personnel.

Japanese side:

Mr. Tadayuki Ogawa	Leader of the Japanese Evaluation Team/ Rural electrification	Senior Advisor, JICA
Ms. Yuki Masuya	Evaluation planning	Energy and Mining Group, Industrial Development and Public Policy Department, JICA
Dr. Kumiko Shuto	Evaluation analysis	Senior consultant, IMG Inc.

Kenyan side:

Ms. Judith Kimeu	Evaluator	Assistant Engineer, Renewable Energy Department, REA
Mr. Hannington Gochi	Evaluator	Senior Technician, Renewable Energy Department, REA

1.3. Schedule of the study

The evaluation team started a literature review in September 2014. Subsequently, the field study in Kenya was conducted from October 1 to 15, 2014. For detailed study schedule in Kenya, refer to ANNEX 1

2. Outline of the project

2.1. Background of the project

The government of Kenya has been actively working on the enhancement of electric power supply

aiming for the stable and balanced economic foundation as well as poverty reduction. Ministry of Energy and Petroleum (MoE&P) has been in charge of the energy sector in Kenya and the Rural Electrification Authority (REA) was established under section 66 of the Energy Act No. 12 of 2006 and became operational in July 2007. REA's mandate, vision and mission are aligned with the national development plan such as Vision 2030. Vision 2030 is designed as a vehicle for accelerating the transformation of the country into an industrialized middle income nation. To achieve this goal, electricity has been identified as one of the drivers where it is expected to achieve 100% electrification rate by 2030.

Regarding the rural electrification, Rural Electrification Master Plan (REMP) has been prepared and updated to attain its goal; 40% of rural electrification rate by 2020 which was below 10% in 2009. Trading centers, secondary schools, health centers are prioritized as important public facilities under REMP, so the electrification rate of those facilities has improved from 10% (2003) to 89% (June, 2013). As a rolling plan of REMP, REA strategic plan has been prepared and updated every 5 years. The latest plan (REA strategic plan 2013/2014-2017/2018) as well as new energy policy by MoE&P clearly states the focus on the utilization of renewable energy. Additionally, in order to promote the decentralization policy under the new constitution (2010), the function of central government is expected to focus on the national level policy formulation, while the county government will be responsible for the planning and implementation of each project.

Therefore, both MoE&P and REA recognized the need for establishment of the rural electrification model by renewable energy to meet these national demands and requested a technical cooperation to Japan International Cooperation Agency (JICA). In response to the request, The Project for Establishment of Rural Electrification Model Using Renewable Energy started in March 2012 for the three-year cooperation period.

2.2. Summary of the project

The Project Design Matrix (PDM) Version 3.1 (ANNEX 2), which is used currently by the Project, specifies the narrative summary of the Project as follows:

(1) Overall Goal

Rural electrification models using renewable energy are disseminated in the country to improve the quality of Kenyan's life.

(2) Project Purpose

Rural electrification models using renewable energy are established.

(3) Outputs

1) A practical model for photovoltaic (PV) electrification of health service institutions in nonelectrified areas is developed through pilot projects
2) A practical model for PV electrification of schools in nonelectrified areas is developed through pilot projects.
3) The Capacity of REA / MoE&P to undertake project using MHP, Biogas and Wind technologies is enhanced.
4) Necessary policy and institutional frameworks for rural electrification using renewable energy are recommended.

(4) Activities

For Preparation

1. Set up a Working Group (WG) consisting of 3 sub-groups for Outputs 1, 2 and 3, with clarified roles and functions of the counterpart personnel.

For all Outputs

1. A weekly project status report is prepared and shared by both C/Ps and JICA Experts (JEs).
2. Monthly project meeting is held by REA.
3. Progress report is prepared by JEs including the progress summary table according to PDM to monitor and report the progress of indicators to achieve outputs.

For Output 1 (The health service institution model)

1-1 National Level

1-1-1 Review policies, studies, surveys and projects related to electrification of health service institutions using Solar PV.

1-1-2 Organize a progress and information sharing meetings with REA, MoE&P, and Ministry of Health (MoH) at least twice to discuss on model establishment and dissemination at national level.

1-1-3 Prepare policy recommendations with institutional framework to promote the health institution model(s).

1-1-4 Prepare a proposal for the disposal of solar panels, batteries and toxic materials according to the current conditions and regulations.

1-2 County/Sub-county Level

1-2-1 Account book and cash flow statement are submitted to County Medical Officer(s) of the project sites at least twice for Lot 1 and once for Lot 2.

1-2-2 Operation and Maintenance (O&M) reports are submitted to County Medical Officer(s) twice for Lot1 and once for Lot 2.

1-2-3 Organize a progress and information sharing meetings with REA, MoE&P (monitoring team members), and County and Sub-county medical officers at least twice to discuss on

model establishment and dissemination at County/Sub-county level.

1-2-4 Conduct the baseline survey at the target facilities and surrounding communities

1-2-5 Conduct capacity & needs assessment of County/Sub-county medical officers in terms of renewable energy utilization and dissemination.

1-3 Local/Institutional Level

1-3-1 Conduct capacity & needs assessment of target communities and other stakeholders.

1-3-2 Sustainable financial plan is prepared.

1-3-3 Sufficient financial trainings for the operator of charging center, staff of health institution, and members of management committee are provided through lectures and on-the-job training (OJT).

1-3-4 The operator of the charging center accurately records daily sale.

1-3-5 Assigned nurse, a treasurer and a chairperson of the management committee accurately records an account book and cash flow statement.

1-3-6 Assigned nurse and a chairperson of the management committee prepare O&M reports.

1-3-7 Identify and manage to obtain agreement with the agencies and/or organization to provide

financial support to sustain the model according to the income by battery charging system.

1-3-8 Prepare detailed plans of the pilot projects including "System design" and "Sustainable O&M" with staff of REA and MoE&P through OJT.

1-3-9 Organize a stakeholder meeting with the members of management committee and owners of facility to discuss on operation and maintenance at least once for each pilot facility.

1-3-10 Organize an information sharing meeting with users of pilot facility and County/Sub-county medical officer(s) at least once for each pilot facility.

1-3-11 Organize an evaluation meeting with the members of management committee and owners and users of facility, County and Sub-county medical officers at the end of the project period at least once for each pilot facility.

<u>For Output 2 (School model)</u>

2-1 National Level

2-1-1 Review policies, studies, surveys and projects related to electrification of schools using Solar PV.

2-1-2 Organize a progress and information sharing meetings with REA, MoE&P, and Ministry of Education, Science and Technology (MoEST) at least twice to discuss on model establishment and dissemination at national level.

2-1-3 Prepare policy recommendations with institutional framework to promote the school model(s).

2-1-4 Prepare a proposal for the disposal of solar panels, batteries and toxic materials according to the current conditions and regulations.

2-2 County/Sub-county Level

2-2-1 Account book and cash flow statement are submitted to County Education Officer(s) of the project sites at least twice for Lot 1 and once for Lot 2.

2-2-2 O&M reports are submitted to County Education Officer(s) twice for Lot1 and once for Lot 2.

2-2-3 Organize a progress and information sharing meetings with REA, MoE&P (monitoring team members), and County and Sub-county education officers at least twice to discuss on model establishment and dissemination at County/Sub-county level.

2-2-4 Conduct the baseline survey at the target facilities and surrounding communities

2-2-5 Conduct capacity & needs assessment of County/Sub-county education officers in terms of renewable energy utilization.

2-3 Local/Institutional Level

2-3-1 Conduct capacity & needs assessment of target communities and stakeholders.

2-3-2 Sustainable financial plan is prepared.

2-3-3 Sufficient financial trainings for the operator of charging center, staff of school, and members of management committee are provided.

2-3-4 The operator of the charging center accurately records daily sale.

2-3-5 Head teacher, a treasurer and a chairperson of the management committee accurately record an account book and cash flow statement.

2-3-6 Head teacher and a chairperson of the management committee prepare O&M reports.

2-3-7 Identify and manage to obtain agreement with the agencies and/or organization to provide financial support to sustain the model according to the income by battery charging system.

2-3-8 Prepare detailed plans of the pilot projects including "System design" and "Sustainable O&M" with staff of REA and MoE&P through OJT.

2-3-9 Organize a stakeholder meeting with the members of management committee and owners of facility to discuss on operation and maintenance at least once for each pilot facility.

2-3-10 Organize an information sharing meeting for the users of the pilot facility and County and Sub-county education officer(s) at least once for each pilot facility.

2-3-11 Organize an evaluation meeting with the members of management committee and owners and users of facility, County and Sub-county education officers at the end of the project period at least once for each pilot facility.

<u>For Output 3 (MHP, Biogas and Wind)</u>

3-1. Conduct inventory and review of existing studies on MHP, Biogas and Wind.

3-2. Prepare guidelines for rural electrification using renewable energy (MHP, Biogas, Wind) according to the contents of the technical trainings in terms of planning, design, procurement, monitoring and maintenance.

3-3. Conduct technical training for REA / MoE&P staff on MHP, Biogas and Wind.

3-4. Carry out simple pre-feasibility study focusing on technical examination for MHP, Biogas and Wind.

3-5. Prepare technical recommendation for rural electrification using MHP, Biogas and Wind.

3-6. Collect necessary data and equipment for technical trainings and development of the guidelines.

3-7. Hold workshops for stake holders to validate guidelines on MHP, Biogas and Wind.

For Output 4 (Policy recommendations)

4-1 Implement and monitor the preparation activities of policy recommendations of Output 1,2 and 3.

4-2 Organize workshop(s) on rural electrification models using renewable energy and/or present the results of the project by C/Ps at the domestic or international conference for information sharing with other stakeholders and donors in the energy sector of Kenya and East Africa.

4-3 Compile policy recommendations.

4-4 Initiate and strengthen the concept of Academic-Private Sector Platform in collaboration with JICA Experts of "the Project for Capacity Development for Promoting Rural Electrification Using Renewable Energy."

3. Method of evaluation

3.1. Five evaluation criteria

The JICA adopted "the Five Evaluation Criteria" for project evaluation. The Five Evaluation Criteria, proposed by the Development Assistance Committee (DAC) at the Organization for Economic Cooperation and Development (OECD) in 1991, are meant to be used for evaluating development assistance activities. The five criteria are namely:

1) Relevance: A criterion for considering the validity and necessity of a project regarding whether the expected effects of a project (or project purpose and overall goal) meet with the needs of target beneficiaries; whether a project intervention is appropriate as a solution for problems concerned; whether the contents of a project is consistent with policies; whether project strategies and approaches are relevant, and whether a project is justified to be implemented with public funds of Official Development Assistance (ODA).

2) Effectiveness: A criterion for considering whether the implementation of project has benefited (or

will benefit) the intended beneficiaries or the target society.

3) Efficiency: A criterion for considering how economic resource/inputs are converted to results. The main focus is on the relationship between project cost and effects.

4) Impact*: A criterion for considering the effects of the project with an eye on the longer term effects including direct or indirect, positive or negative, intended or unintended, and

5) Sustainability*: A criterion for considering whether produced effects continue after the termination of the assistance.

* Since the terminal evaluation study is conducted before the project has finished, these two criteria, impact and sustainability, are based on prospect rather than actual achievement.

By examining the Project's progress and achievement by using these five criteria, the evaluation study ascertains the value of the project from different viewpoints. It attempts to assess performance, make a value judgment about the project, and make recommendations and draw lessons learnt.

The structure of the report is two-fold: (1) the confirmation of achievements and (2) the evaluation results based on the five evaluation criteria.

3.2. Data collection methods and analysis

The study team has collected both quantitative and qualitative data relevant to the Project from a range of information sources by using multiple information-gathering methods (Table 1). This approach enables the study team to undertake triangulation of methods and information sources, thereby ensuring reliability of the study. The focus of the study is on the collection and analysis of both qualitative and quantitative data. Since the main purpose of the study is to make an in-depth analysis of hindering and contributing factors to project implementation, if any, and to understand reasons for having such factors, the analysis of qualitative data was particularly underscored. Thus, research methods adopted for the fieldwork period mainly centered on the qualitative data collection method including in-depth interviews, observation, and questionnaires with many open-ended questions.

The study team formulated the Evaluation Grid (ANNEX 3) based on PDM Version 3.1 to clarify data collection methods, the types of data to be collected and their sources of information. The following table summarizes methods used and information sources the study team accessed during the study period.

Table 1 Data collection methods and source of information

Data collection method	Source of information
Literature/document review	Various project documents and reports written by experts, meeting minutes and other documents

Questionnaires	Project Experts and counterpart personnel (C/P)
Interviews	Project Experts, C/Ps and staff of other related organizations
Observation and interviews	Site Visit to Lot 1 sites: Iltumtum Primary School and Olkinyei Dispensary in Narok County and Irikilinyeti Dispensary in Kajiado County

Review of literature/documents had been undertaken before the Japanese study team visited Kenya. The main purpose of the literature/document review was to understand the level of the project performance and to examine the implementation process. At the same time, questionnaires were prepared for the Project Experts and Kenyan C/Ps. After the Japanese evaluation team arrived in Kenya, in-depth interviews were conducted with key informants such as the C/Ps, Project Experts, and staff of relevant organizations including development partners. The interviews were to supplement information gathered by the literature review and the questionnaire survey.

The evaluation team also observed project activities as they occurred in a natural setting and undertook interviews at several pilot sites: Iltumtum Primary School and Olkinyei Dispensary in Narok County and Irikilinyeti Dispensary in Kajiado County. The information generated by these methods was then analyzed based on the five evaluation criteria.

3.3. Limits and constraints of the study

Due to time and resource constraints, it was not possible to interview all the Experts and Kenyan C/Ps who were involved in project implementation. It was not possible to visit all the pilot sites either. Efforts were made, however, to gather the information by literature review or by interviewing other personnel in a similar field so as to reduce possible sample biases. The study team was able to gather data from the majority of the personnel directly and actively involved in project implementation. Therefore, it is reasonably said that the information collected within the evaluation framework maintains a substantial level of reliability and validity.

4. Project performance and implementation process

4.1. Inputs from Japan

4.1.1. Dispatch of Project Experts

A total of 11 positions of short-term experts such as Team Leader, Rural Electrification, Photovoltaic Power Generation, Wind Power Generation, Micro-Hydropower, Biomass/gas Power Generation, Financial Management, Socio-economic Survey, Community Mobilization, Environment and Social Consideration, etc. have been dispatched since the commencement of the Project. The total Man/Month spent is 90.96.

For more detailed information on the dispatch of the Experts, see "ANNEX 4: List of Project Experts".

4.1.2. Training of C/Ps in Japan and in Third Countries

Three C/Ps participated in the training in Japan and seven C/Ps attended training in third countries, namely, India and Thailand. For the details on the training courses, see "ANNEX 5: List of Counterpart Training in Japan and Third Countries".

4.1.3. Machinery and equipment provided by Japan

Equipment and machinery including a current meter, satellite phone, computers, photocopiers, etc. which are worth 2,119,484 Kenyan Shillings (approx. 2.5 million yen) in total, has been provided. They are generally in good condition and being used on a daily basis. For the details of the items provided, see "ANNEX 6: List of Provided Machinery and Equipment".

4.1.4. Local cost borne by Japan

By the end of the third year of project implementation, a total of 51,642,688 Kenyan Shillings (approx. 62.1 million yen) has been disbursed by the Japanese side for daily project operation (Table 2).

Table 2 Local cost borne by Japan

(unit: KSh.)

	1st Year (FY 2012)	2nd Year (FY 2013)	3rd Year (FY 2014)[1]	3rd Year (FY 2014)[2]	Total
Salary and Allowances	5,751,215	5,890,252	3,576,895	3,220,000	18,438,362
Vehicle related expenses (fuel, Maintenance, etc.)	3,217,107	6,861,977	4,543,732	3,350,000	17,972,816
Rent-a-car and Taxi	1,510,86	2,483,163	1,710,700	1,150,000	6,854,723
Office Airtime , Internet	354,293	399,470	273,040	150,000	1,176,803
Meeting (Workshop and Seminars)	6,150	87,850	0	580,000	674,000
Consumables	899,425	560,795	60,170	290,000	1,810,390
C/P Travel Expenses	0	0	0	560,000	560,000
Overseas Training	997,000	1,531,760	1,215,000	0	3,743,760
Printing for book Binding Report Making (Outside Office)	1,564	55,000	33,030	132,000	221,594
Equipment Maintenance	0	95,120	95,120	0	190,240
Total	**12,737,614**	**17,965,387**	**11,507,687**	**9,432,000**	**51,642,688**

4.2. Inputs from Kenya

4.2.1. Assignment of C/Ps

A total of 19 staff members of REA and MoE&P have been working as the C/Ps and receiving technical transfer from the Experts. This number is a substantial increase from nine in April 2012 when the Project started. While all of them are in possession of sufficient ability to undertake project activities, many of the C/Ps are overloaded with various other duties at REA or MoE&P and timely execution of some of the activities are challenging at many occasions.

[1] Up to August.
[2] After September. Planned amount, not actual amount.

For more detail see "ANNEX 7: List of Counterpart Personnel".

4.2.2. Local cost borne by Kenya

The Kenya Government shares the cost of project implementation, which amounts to 2,360,404 Kenyan Shillings (approx. 2.8 million yen) since the inception of the Project (Table 3).

Table 3 Local cost borne by Kenya

(unit: KSh.)

	FY 2012	FY 2013	FY 2014	Total
International Per Diem (Overseas Training)	574,980[3]	736,690[4]	962,984[5]	2,274,654[6]
Domestic Per Diem	2,250	45,250	38,250	85,750
Total	**577,230**	**781,940**	**1,001,234**	**2,360,404**

4.2.3. Facilities provided by Kenya

An office space including desks, chairs, a lockable cabinet, electricity, water, drinking water and tea have been provided for the Project Experts. The location of the project office, however, is far from REA/MoE&P and the long distance, coupled with heavy traffic in Nairobi, is preventing easy travel between the project office and C/P offices.

4.3. Achievement of outputs

4.3.1. Output 1

Output 1 is "A practical model for PV electrification of health service institutions in nonelectrified areas is developed through pilot projects." Table 4 indicates the achievement of each Objectively Verifiable Indicator specified in PDM version 3.1.

Table 4 Achievements of Objectively Verifiable Indicators for Output 1

Objectively Verifiable Indicator	Achievement
0. All level 0-0 All sub-group working members for Output 1 participate in monitoring at least twice as a monitoring team member.	0-0 Lot 1: 3 times 2 time, Ilkilnyeti: financial training 1 time, Olkinyei: monitoring Lot 2: 1 time 1 time to 3 dispensary: baseline survey
0-1 Monitoring trainings for the monitoring team members including both technical and environmental/community development staff at REA and MoE&P are provided based on their Objective & Achievement Sheet through on-the-iob Training (OJT).	0-1 Lot 1: 5 times Lot 2: 1 time
0-2 At least 3 monitoring team members achieve their	0-2.

[3] USD6,845 was the actual expense.
[4] USD8,720 was the actual expense.
[5] USD11,145 was the actual expense.
[6] USD26,710 was the actual expense.

objectives through trainings. Achievements are confirmed by trainee's self-assessment and evaluation by Project Experts (JEs).	Objective & Achievement test are not carryout yet (It will be conducted around November 2014)
0-3 PV electrification, operation and maintenance manual for health service institutions with battery charging business is prepared for C/Ps including user manual and accounting manual.	0-3. Draft Guideline (Manual) and user manual were prepared. It will be finalized in January 2015.
0-4 At least 2 people from health institution and management committee as well as the operator of charging center are trained to have accurate understanding and to be able to conduct proper O&M of PV facilities including disposal of solar panels, batteries and toxic materials.	0-4. Lot 1: Olkinyei O&M1: 7 people, O&M2: 15 people Ilkilnyeti O&M1: 5 people, O&M2: 10 people, O&M3: 5 people Lot2 : Langata: O&M: 5 people South Horr: O&M: 3people Angata Nanyukie: O&M: 3people
1. National Level 1-1 Collaboration among relevant governmental agencies is started and maintained at national level to support the establishment and dissemination of the model.	1-1. Information sharing meeting was carried out among MoH, REA and MoE&P. (March 11, 2014) The second meeting will be carried out around January 2015.
1-2 Key criteria of the site selection are analyzed and established and sites for Lot 1 and Lot 2 are selected accordingly.	1-2 . Sites for Lot 1 and Lot 2 were selected according to the following criteria. ・Not near to the existing grid line ・Not belonging to private or mission ・Not overlapping with candidate sites of other donors ・Confirmed Safe security environment
2. County/Sub-county Level 2-1 Collaboration among C/Ps, County and Sub-county medical officers is initiated and maintained to support the establishment, operation and maintenance of the model.	2-1 . Information sharing meeting was carried out among County health department, REA and MoE&P. (Kajiado County: June 13, 2014, Narok County: June 16, 2014 , Samburu County: June19, 2014)
3. Local/Institutional Level 3-1. The target health institutions secure the money from battery charging business and other financial source(s) for sufficient maintenance cost such as future purchase of batteries.	3-1 Memorandum of Understanding (MOU) on O&M will be signed between County health department and REA
3-2. Periodical monitoring is carried out by the monitoring team at least 3 times for Lot 1 and twice for Lot 2. Satisfaction for the system is conformed through monitoring.	3-2. Lot 1: 5 times Lot 2: 1 time (31 Aug 2014)
3-3. Awareness raising activities on installed solar PV system at target health institutions and community are held at least 3 times for each Lot 1 sites and 2 times for Lot 2 sites.	3-3. Lot 1: 9 times Lot 2: 6 times

Conclusion of the achievement level of Output 1

Output 1 is judged to be achieved to some degree at present and many of the activities for achieving this output, such as further monitoring, synthesizing monitoring results, finalizing financial analysis, developing guidelines/user manuals and, finally, completing the models are still ongoing.

Furthermore, there is still a certain level of uncertainty with regard to nationwide applicability of O&M of the solar PV systems. More efforts to ensure sustainable O&M models of the solar PV systems, particularly financial and institutional arrangements, need to be made in the remaining implementation period.

Reasons for the above conclusion

Current status of solar PV systems installation at health service institutions is shown in Table 5.

Table 5 Solar PV systems Installation at health service institutions

Lot No.	Name of facility	County	Installation
Lot 1	Olkinyei Dispensary	Narok	July 2013
Lot 1	Ilkilnyeti Dispensary	Kajiado	July 2013
Lot 2	Latakweny Dispensary	Samburu	April 2014
Lot 2	South Horr Dispensary	Samburu	April 2014
Lot 2	Angata Annyokei Dispensary	Samburu	April 2014

The Project installed two solar PV systems at Olkinyei Dispensary in Narok County and Ilkilnyeti Dispensary in Kajiado County as Lot 1 in July 2013, after four to five months delay from the originally-planned schedule. This delay was caused mainly due to prolonged discussions between the Experts and JICA HQs regarding appropriate system designs. On top of that, solar PV systems installation at Meto Dispensary in Kajiaro County which was selected as one of Lot 1 sites was cancelled in July 2013, just before installation, because grid extension work had started in the area. Before the decision on cancellation was made, activities such as the Orientation for Financial Management, Technical Transfer Seminar on Bookkeeping, Stakeholder Meeting and so forth, inviting Community Chief, Head Teacher and Head Nurse and so on had already been conducted in Meto and discussions on details of the plan had started among the community stakeholders. In the same breath, it was revealed, after the completion of solar PV systems installation, that grid extension to Olkinyei Dispensary would start shortly.

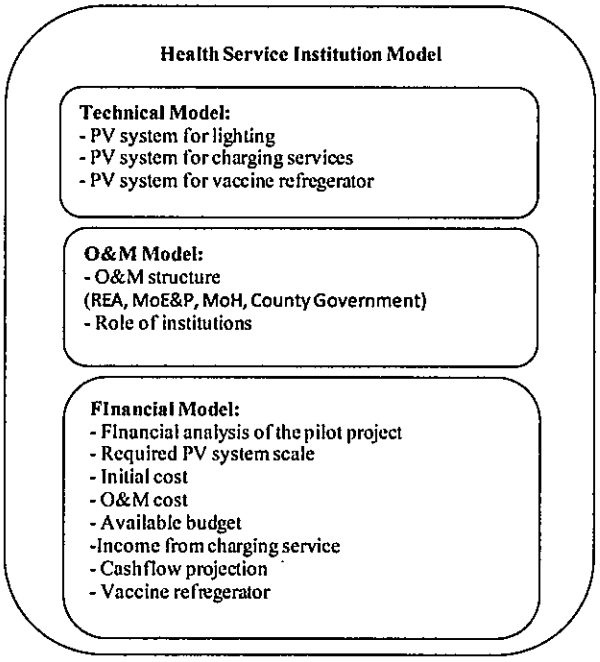
For Lot 2, three dispensaries, namely Latakweny, South Horr, and Angata Annyokei in Samburu County were selected in September 2013 and the systems were installed in April 2014. These three sites were finally selected after repeated re-identification processes because it had been realized later that REA's grid extension plan would cover several planned sites. This problem caused eleven months' delay in finalizing the Lot 2 sites.

Such delays in activities in Lot 1 and 2 gave rise to inefficiency in the production of Output 1 (and Output 2, equally), in that the Project had to spent time and human resources, which were later wasted, and also in that the Project could not have sufficient amount of time for monitoring after

systems installation. Information and data gathered during monitoring activities, therefore, are able to attain only a moderate level of reliability for developing optimal models, which was particularly the case with the Lot 2 facilities.

Despite several system troubles which happened after solar PV systems installation, the Project is now in the process of monitoring these two Lots by involving local stakeholders such as County and Sub-county medical officers. Four of these officers attended a training course held at Jomo Kenyatta University of Agriculture and Technology (JKUAT) and improved their technical capacity in solar PV system O&M.

Through these activities of installation, stakeholder involvement and monitoring, the Project is on the right track of developing practical models which are basically composed of (1) a system design, (2) sustainable O&M, and (3) sustainable financial plans (Figure 1).



Source: JICA Expert Team (2014) Project for Establishment of Rural Electrification Model Using Renewable Energy in the Republic of Kenya (p.29), Progress Report 5

Figure 1 Health Service Institutions Model

The Objectively Verifiable Indicators listed in Table 4 indicate that some of the activities are still ongoing and the achievement levels need to be measured later towards the end of the project period. Such indicators include the sub-group working members conducting monitoring for Lot 2 (Indicator 0-0), the Objective & Achievement Test (Indicator 0-2), the preparation of the operation and maintenance guidelines and user manuals (Indicator 0-3), the signing of the MOU (Indicator 3-1), and periodical monitoring for Lot 2 (Indicator 3-2).

Among these activities in progress, the progresses which merits most attention are the Objective & Achievement Test as it practically measures the level of improved capacity of the monitoring team

members, the preparation of the guidelines and user manuals, and the last but not least is the signing of the MOU[7]. The successful signing of the MOU and the manifestation of the MoH County Offices' commitment to the O&M of the solar PV systems will be a remarkable milestone for the Project since it will be a significant step towards institutional and financial sustainability to the models developed. The MOU would particularly endorse the sustainable O&M and financial plans proposed by the Project. In this sense, successful signing of the MOU and subsequent action taken by the MoH and REA in accordance with the MOU would significantly alleviate uncertainty associated with O&M of the solar PV systems, both financially and institutionally.

The other important aspect regarding Output 1 is to what extent technical transfer from the Experts to C/Ps has been realized through the process of models development. To answer this question, one needs to wait until the Objective & Achievement Test is conducted in November this year. However, the interviews with the Experts and C/Ps during the evaluation study aptly suggest that the C/Ps' involvement was rather limited to participation in discussions with the Experts as they developed ideas about system design. The C/P participation in discussion on sustainable O&M and financial plans was very much limited mainly due to the reason that there are unclear roles and responsibilities at the REA's side with regard to the O&M issues. Basically speaking, REA is responsible for installing systems and after the handover of solar PV systems, it is the users' responsibility to look after O&M matters. As such, who and what departments should be responsible for developing sustainable O&M and financial plans for the model with the Experts are not so clear. In fact, the Project's latest Progress Report 5 (drafted in September 2014) states the followings.

> *"Technical transfer of the so-called soft component issues from JET to REA is one the main purposes of the Project but not enough techniques and knowhow were transferred so far in the soft-component field. REA's mission is up to construction and installation but it does not cover O&M. Thus, they have no personnel, budget and experience for O&M of installed electric systems. This situation is same for MoE&P."(p.96)*

Apart from participation in discussion, the C/Ps' involvement in pilot site visits was also very much limited mainly owing to the C/Ps' unavailability. The C/Ps were always very much occupied with other duties including the Laptop Program and could not find time to visit pilot sites, particularly to go to Lot 2, which was very far from Nairobi. Their limited participation in field visits was a big challenge for the Experts to transfer their technical skills and knowledge to the C/Ps in building

[7] The MOU asks for the MoH's financial contribution to the major expenses, such as repair and replacement of batteries, inverters and charge controllers, required for sustainable operation and maintenance of the PV systems. It is not financially feasible for each dispensary to bear such costs since the amount is far larger than the income it can generate from its routine battery charging business.

optimal electrification models using solar PV systems.

4.3.2. Output 2

Output 2 is "A practical model for PV electrification of schools in nonelectrified areas is developed through pilot projects." Table 6 indicates the achievement of each Objectively Verifiable Indicator specified in PDM version 3.1.

Table 6 Achievements of Objectively Verifiable Indicators for Output 2

Objectively Verifiable Indicator	Achievement
0. All level 0-0 All sub-group working members for Output 1 participate in monitoring at least twice as a monitoring team member.	0-0 Lot 1: 2 time Iltumtum, Olemoncho: monitoring and technical monitoring Lot 2: 1 time 3 schools: baseline survey
0-1 Monitoring trainings for the monitoring team members including both technical and environmental/community development staff at REA and MoE&P are provided based on their Objective & Achievement Sheet through OJT.	0-1 Monitoring Lot 1: 5 times Lot 2: 1 time
0-2 At least 3 monitoring team members achieve their objectives through trainings. Achievements are confirmed by trainee's self-assessment and evaluation by JEs.	0-2 Objective & Achievement test are not carryout yet (It will be conducted around November 2014)
0-3 PV electrification, operation and maintenance manual for schools with battery charging business is prepared for C/Ps including user manual and accounting manual.	0-3. Draft Guideline (Manual) and user manual were prepared. It will be finalized in January 2015.
0-4 At least 3 people from school and management committee as well as the operator of charging center are trained to have accurate understanding and to be able to conduct proper O&M of PV facilities including disposal of solar panels, batteries and toxic materials.	0-4 Iltumtum O&M1: 35 people, O&M2: 4 people Olemoncho O&M1: 30 people, O&M2: 10 people Marti: O&M: 7 people Tuum: O&M: 10 people Illaut: O&M: 3 people
1. National Level 1-1 Collaboration among relevant governmental agencies is started and maintained at national level to support the establishment and dissemination of the model.	1-1. Information sharing meeting was carried out among MoEST, REA and MoE&P. (March 14, 2014) The second meeting will be carried out around Januar 2015.
1-2 Key criteria of the site selection are analyzed and established and sites for Lot 1 and Lot 2 are selected accordingly.	1-2 ・Not near to the existing grid line ・Not belonging to private or mission ・Not overlapping with candidate sites of other donors ・Confirmed Safe security environment
2. County/Sub-county Level 2-1 Collaboration among C/Ps, County and Sub-county education officers is initiated and maintained to support the establishment, operation and maintenance of the model.	2-1 Information sharing meeting was carried out among County education department, REA and MoE&P. (Narok County: June 16, 2014 , Samburu County: June 19, 2014)

3. Local/Institutional Level 3-1. The target schools secure the money from battery charging business and other financial source(s) for sufficient maintenance cost such as future purchase of batteries.	3-1 MOU on O&M will be signed between County education department and REA
3-2. Periodical monitoring is carried out by the monitoring team at least 3 times for Lot 1 and twice for Lot 2. Satisfaction for the system is conformed through monitoring.	3-2. Lot 1: 5 times Lot 2: 1 time (31 Aug 201)
3-3. Awareness raising activities on installed solar PV system at target schools and community are held at least 3 times for each Lot 1 sites and 2 times for Lot 2 sites.	3-3. Lot 1: 9 times Lot 2: 6 times

Conclusion of the achievement level of Output 2

The achievement of Output 2 is basically the same as that of Output 1. Output 2, however, has more challenges than Output 1 in terms of institutional and financial arrangements of sustainable O&M of solar PV systems since involvement of MoEST in establishing the O&M mechanism is still nascent.

Reasons for the above conclusion

Current status of solar PV systems installation at schools is shown in Table 7.

Table 7 Solar PV systems Installation at schools

Lot No.	Name of facility	County	Installation
Lot 1	Olemoncho Primary Boarding School	Narok	July 2013
Lot 1	Iltumtum Primary Boarding School	Narok	July 2013
Lot 2	Tuum Primary School	Samburu	April 2014
Lot 2	Illaut Primary School	Samburu	April 2014
Lot 2	Marti Primary School	Samburu	April 2014

The reasons for the above conclusion are basically the same as those of Output 1. However, Output 2 faces more challenges than Output 1 in terms of O&M.

Two schools in Narok County, namely Olemoncho Primary Boarding School and Iltumtum Primary Boarding School had solar PV systems installed in July 2013 (Lot 1). Tuum, Illaut and Marti Primary Schools in Samburu County also had their solar PV systems installed in April 2014 (Lot 2). Unlike Lot 1 for Output 1, none of the schools were cancelled for systems installation because of grid extension. However, just like Olkinyei Dispensary, it has become known that grid extension to Iltumtum Primary Boarding School would commence shortly although installation was already completed there.

The schools with solar PV systems are also facing the same financial problem as dispensaries of

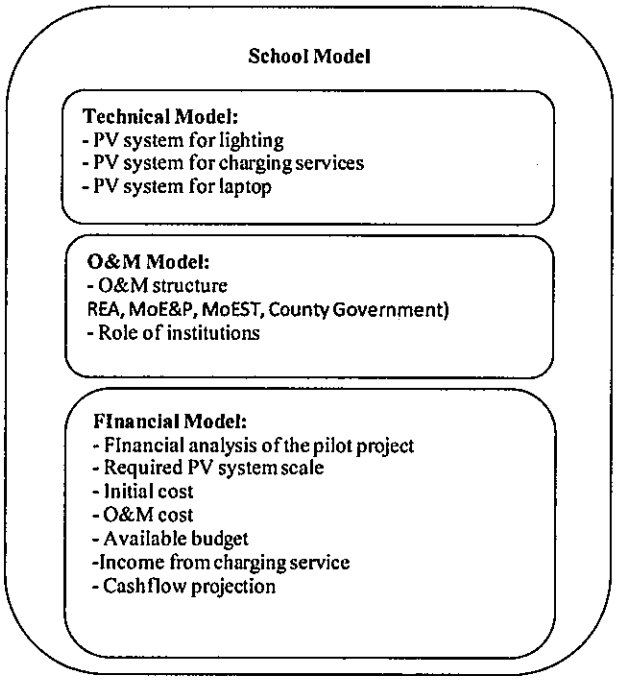
Output 1 in that they cannot generate enough income for future repair and replacement of batteries, inverters and charge controllers, etc. through their battery charging businesses. Although the County Offices of MoH are now positively considering bearing the O&M costs on behalf of the dispensaries (Output 1), the MoEST has not started discussing this issue at the institutional level. Since it has already been decided that implementation of the education policy will not be decentralized, it is unlikely that County Offices of MoEST will bear the cost for O&M. Thus, the issue of "Who will bear the O&M cost?" needs to be clarified in future discussions.

On top of that, on the technical side also, none of the staff of MoEST, County Offices and schools have attended solar PV O&M skills training so far. This is mainly due to the fact that institutional frameworks for O&M of school solar PV systems are yet to be clarified due to the initial stage of coordination and dialogues between MoEST and REA/MoE&P. Therefore, compared with the situation of Output 1, Output 2 still has many issues of institutional arrangement for budgeting O&M to be addressed in the remaining project period.

The instalment of solar PV systems at pilot sites for Output 2 was delayed just like Output 1. The delay in Lot 2 activities, in particular, resulted in getting the installation period to coincide with REA's busy time in deciding solar PV systems specifications for the Kenyan Government's "Laptop Program to Primary Schools (or simply "Laptop Program" for short)"[8]. The Project, as a result, could not give technical input to REA's decision at the time, which culminated in the Project's missing the chance to influence Laptop Program. This issue will be taken up in detail later in "5.4 Impact".

On the other hand, the positive side is that Kenyan Government's Laptop Program which aims at supplying one laptop computer per child and electrifying all the primary schools in Kenya is accelerating solar PV installation efforts at REA. If the models consisting of (1) a system design, (2) sustainable O&M and (3) sustainable financial plans (Figure 2), which are to be proposed by the Project, are adopted by this nation-wide initiative, the Project's impact would be significant. At the moment, however, the Project is giving little impact as will be examined in "5.4 Impact" later in this report.

[8] The Laptop Program aims at installing 3,000 solar PV systems between March 2014 and June 2015. The completed number of installation at schools is 215 as of 13 August 2014.



Source: JICA Expert Team (2014) Project for Establishment of Rural Electrification Model Using Renewable Energy in the Republic of Kenya (p.42), Progress Report 5

Figure 2 School Model

4.3.3. Output 3

Output 3 is "The capacity of REA/ MoE&P to undertake project using MHP, Biogas and Wind technologies is enhanced." Table 8 indicates the achievement of each Objectively Verifiable Indicator specified in PDM version 3.1.

Table 8 Achievements of Objectively Verifiable Indicators for Output 3

Objectively Verifiable Indicator	Achievement
3-1. Training is conducted for at least 2 C/Ps for each renewable energy technology.	3-1. MHP: 3 Biogas: 2 Wind: 2
3-2. Guidelines are established for each renewable technology (MHP, Biogas and Wind).	3-2. Draft Manuals (guidelines) were developed in Progress Report 5. Manual Development Committee will be established around October for meetings.
3-3. Guidelines are utilized by relevant ministries, governmental agencies and County/Sub-county offices.	3-3. Manuals (guidelines) will be used by staff of REA and MoE&P.
3-4. Seminar and training for technical transfer are conducted for C/Ps based on their Objective & Achievement sheets.	3-4. MHP: 1time Biogas: 1 time Wind: 1 time
3-5. At least 6 C/Ps achieve their objective through training. Achievements are confirmed by trainee's self-assessment and evaluation by JEs.	3-5.The Objective & Achievement Test will be carried out in November.

3-6. At least one pre-feasibility study document for future practical model for MHP, Biogas and Wind is prepared.	3-6. Progress of simple pre-F/S: MHP(60%), Biogas (80%), Wind (70%). All simple pre F/S will be completed by the end of November 2014.

Conclusion of the achievement level of Output 3

Output 3 is expected to be achieved to some degree if the ongoing activities, such as the preparation of guidelines and documentation/ presentation of Simple Pre- Feasibility Study (F/S), are completed as planned. Since the pilot projects for Output 3 were cancelled toward the end of the first year of the project period, mot of the C/Ps had little chance to practice in the actual implementation what they have learned in trainings. The C/Ps' more active participation is needed in the ongoing activities for Output 3 so that their practical knowledge will improve in the remaining project period.

Reasons for the above conclusion

The Project spent eight to nine months in the first year discussing its possible collaboration with "Community Power Centres (Energy Kiosks)" undertaken by the United Nations Industrial Development Organization (UNIDO). However, after discussions with REA, MoE&P, JICA, and the UNIDO, it was decided the Project would not collaborate with the UNIDO in implementing pilot projects for MHP, biogas and wind since it was realized that the UNIDO's activities were facing many challenges.

The final decision was made in March 2013 and since then the focus of Output 3 shifted from pilot project implementation to offering trainings to C/Ps for capacity development. Because of this alteration, transferring practical skills and techniques from the Experts to C/Ps became difficult and, as an alternative, the Project gave intensive training through seminars and periodical instruction about study and planning to the C/Ps with occasional practical guidance when the C/Ps had a chance to visit fields and when C/Ps were available in the office. The Experts also embarked upon preparing guidelines for each of the technologies, i.e. MHP, biogas and wind.

As shown in Table 8 (Indicator 3-1), three C/Ps for MHP, two for biogas, and two for wind technologies went through training. Since the level of capacity improvement of these C/Ps will be measured later in November when the Project conducts the Objective & Achievement Test (Indicator 3-5), it was not possible for the evaluation team to objectively measure the Project's effect at the time of evaluation. However, the interviews with the Experts and C/Ps suggest that although the C/Ps were able to increase their theoretical knowledge in each field of technology, they were not fully confident in putting the knowledge into practice since they didn't have such opportunities in the Project. Besides, the time spent for the seminar was relatively short for all the technology fields, ranging from half-day to one and a half day in the whole project period. It is hoped that the C/Ps will utilize the guidelines developed by the Experts for future REA project implementation in the field.

With regard to Indicator 3-6, a pre-F/S document for each of MHP, biogas and wind, was prepared mainly with the initiative of the Experts, except for the paper on biogas which one of the two C/Ps took the initiative to write. The papers are expected to be presented by the C/Ps at the JKUAT's 9th Scientific, Technological and Industrialization Conference to be held in November this year.

4.3.4. Output 4

Output 4 is "Necessary policy and institutional frameworks for rural electrification using renewable energy are recommended." Table 9 indicates the achievement of each Objectively Verifiable Indicator specified in PDM version 3.1.

Table 9 Achievements of Objectively Verifiable Indicators for Output 4

Objectively Verifiable Indicator	Achievement
4-1. International workshop is held to share the results of the project (e.g. EAC conference).	4-1. International workshop will be held in February 2015.
4-2. Technical transfer workshops for C/Ps are held 3 times.	4-2. total 3 times Solar PV: 1 time (Sept 27, 2013) MHP/Biogas: 1 time (Oct 25, 2013) Wind: 1 time (Oct 25, 2013)
4-3. Recommendations for C/P to implement the effective electrification by renewable energy are provided to be reflected on their rural electrification policy.	4-3. Recommendation will be finalized in project completion report.

Conclusion of the achievement level of Output 4

Output 4 is expected to be achieved to a relatively high degree if the remaining activities, such as holding the International Workshop and proposition of recommendations are completed as planned. On the other hand, whether or not the Project can present effective and realistic recommendations depends largely on successful production of Output 1 through 3. The Experts are now preparing recommendations based on findings from the three Outputs. Close discussions with the C/P institutions need to be undertaken in order to produce truly useful recommendations.

Reasons for the above conclusion

The achievement of Output 4 is highly dependent on Indicator 4-3, proposition of recommendations on effective electrification by using renewable energy. The achievement of Indicator 4-3 cannot be realized without successful production of Output 1 through 3. In this sense, the achievement of this output is regarded to be still in half-way.

Nevertheless, the Project is steadily heading its way for making practical recommendations based on its experiences both in the field and in policy analysis. The most significant contribution of the Project to the C/Ps' policy on renewable energy would be its comprehensive and meticulous analysis of the four technologies, solar PV, MHP, biogas and wind, which incorporates elements including

institutional frameworks (policy, regulation and system), financial arrangements, technical arrangements, and consumer benefits.

It was confirmed during the interviews with the C/Ps that before the Project REA was not paying so much attention to such multiple dimensions in applying renewable energy technologies in the field. Now their awareness has increased and the C/Ps have realized the importance of appropriate design, sustainable O&M which involves optimal institutional frameworks, and sustainable financial plans.

The Experts are now drafting recommendations based on their findings and learnings from Output 1, 2 and 3. In order to make effective, realistic and useful recommendations for the C/P, close discussions between the Expert team and C/P, both at the working level and high level, need to be conducted before the Project finalizes the recommendations in Project Completion Report.

4.4. Achievement of the project purpose

The project purpose is set as "Rural electrification models using renewable energy are established." Table 10 indicates the achievement of each Objectively Verifiable Indicator specified in PDM version 3.1.

Table 10 Achievements of Objectively Verifiable Indicators for the Project Purpose

Objectively Verifiable Indicator	Achievement
1. The developed guidelines and manuals are applied to the projects implemented by the REA and MoE&P (C/P).	1. In the solar PV project that REA carries out in 2014/2015 and 2015/2016, guideline and manual prepared in this project are expected to be adopted.
2. The Outputs of the Project are incorporated into implementation of REA Annual Renewable Energy Work Programme (Performance Contract).	2. In 2015/2016 Annual Renewable Energy Work Programme of REA, implementation of the demonstration project using developed model will be written.
3. Renewable energy facilities installed by the Project are operated and maintained properly with sustainability.	3. Ownership of the pilot plants will be transferred to MoEST and MoH through REA around November 2014. MOU on O&M will be signed between REA and Ministries.
4. Implementation structures of national/county governmental agencies and local stakeholders are established.	4. Implementation structures will be established by the MOU on O&M between REA and Ministries.
5. Variety of expertise in renewable energy is increased among members of C/P (C/Ps).	5. Technical transfer on MHP, Biogas and Wind were conducted to the counterpart. Expertise is increased among member of CPs.

Conclusion of the achievement level of the Project Purpose

The Project Purpose is achieved to some degree at present. If unfinished activities are conducted successfully, the achievement level is expected to be relatively high at the end of the project period.

Successful completion of all the activities for the four Outputs with full participation from the C/Ps is required to attain a high level of achievement.

Reasons for the above conclusion

The Objectively Verifiable Indicators for the Project Purpose are concerned with the C/P's application of guidelines and manuals the Project develops, adoption of the models proposed, sustainable O&M of the pilot solar PV systems, and increased expertise in a variety of renewable energy technologies.

The achievement level of the Project Purpose depends largely on successful preparation and signing of MOU with MoH/ MoEST and subsequent implementation of O&M of solar PV systems in accordance with the MOU. The C/P's commitment to the utilization and adoption of the guidelines and models proposed by the Project also directly influences the effects of the Project.

The Project needs to complete all the remaining activities identified earlier in this report so that the guidelines, manuals, models and recommendations would be practical, realistic and effective. The Project also needs to continue having close discussions with REA, MoE&P, MoH, MoEST and county governments for establishing optimum institutional and financial frameworks for O&M as well as for the C/P's leveraging the Project's outputs.

4.5. Implementation process

The following items are identified as salient factors which influenced the Project, either positively or negatively, during the course of project implementation.

4.5.1. Factors which influenced the Project positively

There is one factor which influenced the Project positively, particularly in terms of raising efficiency.

(1) Collaboration with JKUAT and the BRIGHT Project

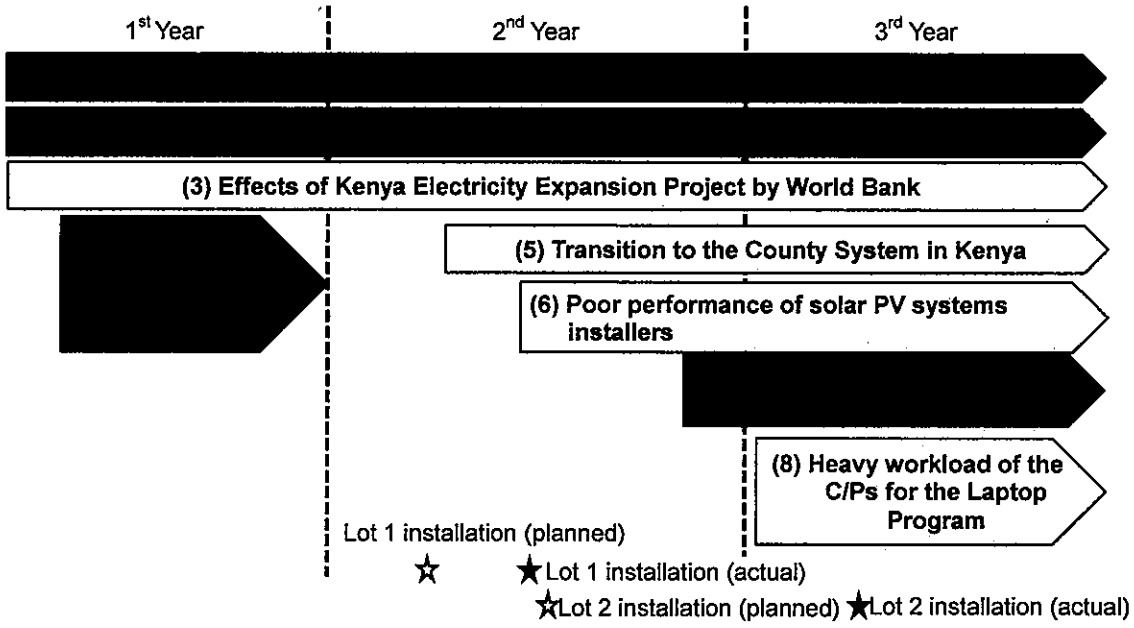
The C/Ps and staff of County Offices of the MoH have been attending and/or making presentations at various seminars and trainings organized by the JKUAT and/or JICA's technical cooperation project "The Project for Capacity Development for Promoting Rural Electrification Using Renewable Energy (the BRIGHT Project)". Such collaboration with JKUAT and the BRIGHT Project is contributing to raising efficiency of the Project.

4.5.2. Factors which stand as challenges to the Project

One of the most noticeable characteristics is that the Project has been faced with so many factors which stand as challenges to the overall or specific activities in the course of project implementation. Eight factors, from (1) to (8) below, are identified as key challenges which significantly influenced

the Project's efficiency and effectiveness. Figure 3 depicts a timeline of the eight factors as they occurred along the course of the Project's progress.

Figure 3 Timeline of the eight challenges to the Project



(Source: The Evaluation Team)

Among these factors in the figure, the dark shaded arrows (1, 2, 4, and 7) should be considered as endogenous factors which were fairly within the control of the project implementers, i.e. REA, MoE&P and JICA. These factors could have been avoided to a large extent if the implementers took appropriate action beforehand or during the problem.

The light shaded arrows (3, 5, 6, and 8), on the other hand, are more likely to be exogenous factors which were beyond the control of the project implementers. The implementers should have identified these problems before they had happened and took appropriate risk control measures, such as continuous and frequent information sharing among implementers.

Here are more detailed explanations of each factor listed in the figure.

(1) Demanding work volume of the C/Ps

Demanding work volume of the C/Ps outside the Project, such as work for diesel power generation, has been impeding effective and efficient technical transfer from the Experts to C/Ps. In particular, the C/Ps have been having a hard time finding time to go to the pilot sites (for Output 1 and 2) and pre F/S sites (for Output 3). Hence much of the field activities, particularly activities for Output 1 and 2, have been conducted by the Expert Team alone, without much participation from the C/Ps.

(2) Inconvenient location of the project office

The project office is located far from REA/ MoE&P, making the Experts and C/Ps difficult to see each other in person. This physical distance inhibits smooth project operation to a significant degree.

(3) Effects of rapid grid extension in Kenya

REA has been vigorously extending electrical grids to non-electrified areas in Kenya. The sites extended by grid, by nature, often overlap with the Project's potential and existing solar PV pilot sites. In fact, the Project had to re-select the pilot sites for Lot 2 several times since it became apparent the area would be soon covered by grid extension plans. It took much longer time for the Project to finalize its selection of the pilot sites, particularly for Lot 2.

(4) Time spent for planning collaboration with UNIDO

In the first year of the Project, the Project Team spent about nine months planning the details of collaboration with UNIDO. The collaboration was planned to facilitate pilot activities of MHP, biogas and wind power, which was for Output 3. However, after research, it was realized that such collaboration would not be effective and a decision was made to cancel the plan. The Project had to modify the plan for Output 3 substantially and the time spent for planning since the commencement of the Project was wasted[9] to a large extent except for utilization to Pre-FS and Guidelines.

(5) Transition to the County System in Kenya

Kenya has seen a transition to the County System in the last few years. The roles and responsibilities of the central government and county governments dramatically changed particularly in mid to late 2013 (for Output 1). This change has caused the Project to spend a lot time for coordination with both national and sub-national stakeholders with regard to the O&M of the pilot solar PV systems.

(6) Poor performance of solar PV systems installers contracted by the Project

The level of skills and techniques of local solar PV systems installers contracted by the Project was much lower than anticipated. The solar PV systems at the pilot sites are facing repeated technical and mechanical troubles which need to be rectified frequently by the Project. The Project Team has to spend such a long time shooting troubles in the fields that some of the work that needs to be done in Nairobi is being delayed.

(7) Remoteness of the pilot sites of Lot 2

[9] It is not appropriate to say the time was completed wasted since part of information gathered by the research conducted during the preparation period was later utilized for developing seminar materials for the revised Output 3. Still, it is clear that the Project had to spend a large amount of resources during the nine months' preparation period.

The Project had to select pilot sites for Lot 2 which were far in the distance from Nairobi because there was no other choice. The selection was appropriate considering typical areas where off-grid electrification systems operate. However, the sites have security issues and require a long travel time. It is not possible for the Experts and C/Ps to visit the sites often within the limited timeframe of the Project, which in turn hampers technical transfer activities for Output 1 and 2.

(8) Heavy workload of the C/Ps for the Laptop Program

The C/Ps' work volume for the Kenyan Government's Laptop Program has become increasingly large since around April 2014. The time they can spend for project activities has become even less than before.

5. Evaluation results[10]

5.1. Relevance

Summary: Relevance is relatively high. The project is well aligned with Kenya's development priority as well as with Japan's ODA policy towards Kenya. The project is also appropriately responding to the needs of the target group, especially the needs of those public facilities in nonelectrified areas by mobilizing Japan's comparative advantage of expertise in renewable energy, community participation, O&M, and business analysis. On the other hand, Kenya has been seeing rapid grid extension in recent years and some of the sites selected for the pilot project have become covered by such an extension. Such a situation could have been avoided if strategic and systematic planning on rural electrification had been in place at REA/MoE&P before the commencement of the Project.

(1) Relevance to the development plan of Kenya

In its VISION 2030, the Republic of Kenya is adamant about all Kenyan citizens having electricity by 2030. VISION 2030 also promises that renewable energy sources will be exploited to increase the supply of energy in Kenya. The Rural Electrification Master Plan (REMP) for 2008-2018 targets electrifying 40% of rural households by 2020. In the REMP, tapping renewable sources of energy, such as solar technologies, wind turbines, hydropower and biogas engines is considered where on-site conditions for resource availability are favourable.

More recently, the National Energy Policy was drafted in 2013, therein the importance of renewable energy in terms of enhanced energy security, climate change mitigation, income generation, job creation and generation of foreign exchange savings is recognized. It also acknowledges Kenya's renewable energy potential including wind, solar and biomass.

These policy directions and development priorities of Kenya concerning rural electrification and the

[10] The levels of the five evaluation criteria are rated based on the scale of "High", "Fair" and "Low".

development of renewable energy are, in no doubt, in alignment with the Project's aim and scope in pushing forward developing a rural electrification model using renewable energy.

(2) Relevance to Japan's ODA policy towards Kenya

Japan's Country Assistance Policy to Kenya (2012) set forth Japan's support in improving access to electricity in Kenya. The policy underscores Japan's cooperation to Kenya in promoting stable supply of electricity which is indispensable for maintaining Kenya's economic growth. Japan's Rolling Plan for Kenya (2012) positions the Project as part of Japan's program entitled "Improvement of Generation and Transmission Capacity", which focuses on meeting the increasing demand of electricity in Kenya.

Given this policy context, it is fair to say that the Project is highly consistent with Japan's ODA policy.

(3) Responsiveness to the needs of the target group

The Project's target groups are diverse. They range from MoE&P, REA, MoEST, MoH, County/Sub-County Education/Medical Officers in pilot project sites, to members of pilot project school and dispensary management committee and other related persons at pilot project facilities in rural areas.

The Project endeavours to develop the capacity of people and organizations of the target groups, particularly the C/P staff at MoE&P and REA, in developing and establishing rural electrification models using renewable energy. The Project's focus is considered to be appropriate since both the C/P organizations as well as beneficiaries of the Project at sub-national levels recognize the needs for building capacity of establishing and operating electrified public facilities by solar PV in rural areas. MoE&P and REA are also in need to acquiring skills and knowledge for MHP, biogas and wind technologies.

On the other hand, Kenya has been seeing rapid grid extensions in recent years and Meto Dispensary in Kajiaro County selected for the pilot project (Lot 1) has become covered by such an extension. Olkinyei Dispensary and Iltumtum Primary Boarding School in Narok County (Lot 1), where solar PV systems were already installed are scheduled to have grid extension shortly. Such a situation could have been avoided if strategic and systematic planning on rural electrification had been in place at REA/MoE&P.

Therefore, it is reasonable to say that the Project is well addressing the need of the target groups by practically pushing forward the agenda of promoting renewable energy use. A reservation is made, however, since some of the pilot sites are being covered by grid extension plans.

(4) Appropriateness of Japan's technical knowledge and skills

The Expert Team is composed of personnel who have rich experience of working in the renewable energy sector, coupled with experts in socio-economic fields including community participation, O&M, environmental assessment and business analysis. The Experts aim at transferring comprehensive technical skills and knowledge to the C/Ps, which are necessary for establishing and sustainably operating facilities in rural settings. Thus, it is fair to say that Japan's expertise in renewable energy is effectively leveraged by the Project.

(5) Appropriateness of the implementation approach

The Project employs a capacity development approach, rather than a service delivery approach as a technical cooperation project. The former focuses on working with the C/Ps on a daily basis to gradually attain a set goal of improving their skills and knowledge in a certain field, in this case, renewable energy. The latter, on the other hand, tends to concentrate on delivering tangible services (or deliverable) such as facilities, policy documents, operation manuals and so forth, more often than not, without much involvement from the C/Ps. The burning issue the C/P organizations faced before the inception of the Project was, and still is, to acquire knowhow and skills pertaining to establishing models which can be easily replicated. In this respect, sharing and exchanging the knowledge between the Experts and C/Ps through working together to implement pilot projects is considered to be the best capacity development approach.

Therefore, it is fair to say that the Project is appropriately designed in concordance with the needs of the target groups and the Project's implementation approach maintains validity in terms of developing capacity of the C/Ps.

5.2. Effectiveness

Summary: Effectiveness is fair at present. Although the project purpose is expected to be achieved to a relatively high degree by the end of the planned period, there is still uncertainty regarding the achievements of all the Outputs, from Output 1 through 4. If ongoing activities are completed smoothly and effectively and the concerned institutions take action in accordance with the recommendations to the Project specified in this report, effectiveness is expected to be higher at the completion of the Project.

(1) Prospect of the achievement of the project purpose

The Project Purpose is "Rural electrification models using renewable energy are established". Judging from the progress of the project activities and the current situation of the achievements of the four Outputs, it is fair to say that the Project Purpose is still halfway to achieving its target. Perhaps the most remarkable achievements the Project have made so far are helping the C/P institutions realize the importance of (1) adopting appropriate designs in response to the particular

situations in which the system would operate, (2) assessing financial feasibility and (3) ensuring practical and functional institutional arrangements for O&M. The achievements also include REA's stronger initiative to carry out appropriate social and environmental responsibilities as guided by the Experts in environmental issues. The Project, furthermore, contributed to the C/Ps' increasing knowledge on a variety of technologies of renewable energy, i.e. PV, MHP, biogas and wind.

Nevertheless, there are still many challenges that need to be tackled in the remaining project period. For Output 1 and 2 (solar PV model development), sustainable models should be completed by the Project Team and the agreement from concerned institutions, particularly from MoH and MoEST, need to be reached in the area of O&M. As for Output 3, the C/Ps need to synthesise the knowledge they gained through the seminars/ Simple Pre-F/S and comprehensive documents need to be prepared. They also need to finalize the guidelines in the upcoming Manual Development Committee. The final output, Output 4, will be culmination of all the outputs produced, where useful policy suggestions are presented for the improvement of Kenya's rural electrification endeavour using renewable energy. The C/P institutions are advised to have constructive discussions with the Project Team to pave the way to institutionally adopting the recommendations made by the Project, which, in turn, will lead to the achievement of the Project Purpose.

(2) Project management system

Insufficient communication among the Experts and C/Ps was pointed out as a hindering factor to effectiveness during the Mid-term Review. This issue was appropriately addressed by the C/P organizations, particularly by the Project Manager at REA, through means such as holding a monthly meeting to share information and monitor progress. The management of the Project, particularly the communication issue, is judged to be handled appropriately after the Mid-term Review.

However, due to reasons such as C/Ps' demanding work volume and physical distance between the project office and REA/MoE&P explained in "4.5.2 Factors which stand as challenges to the Project", close communication, particularly face-to-face communication between the Experts and C/Ps, has remained as a challenge throughout the project period

(3) Promoting and hindering factors to the achievement of the Project Purpose

Notable factors which influenced the Project Purpose either positively or negatively are as already explained in "4.5.1 Factors which influenced the Project positively" and "4.5.2 Factors which stand as challenges to the Project". While one item regarding collaboration with the JKUAT and BRIGHT Project was identified as a promoting factor, as many as eight items in 4.5.2 are identified as hindering factors. The negative influence of the eight items on the Project was significant in that the Project's overall efficacy has become reduced throughout the project period. The area which was affected most was the Project's effort to develop the C/Ps' capacity in planning and implementing

rural electrification projects through imparting hands-on information and know-how to them. Not enough participation from the C/Ps was materialized for such activities since the C/Ps were occupied with other duties most of the time. Although tangible outputs such as manuals, guidelines, ideas for models and scientific papers are being produced as planned by the Project, the C/Ps' contribution to producing such deliverables cannot be considered sufficient. In other word, technical transfer from the Experts to the C/Ps has been insufficient as shown in the current situations of Output 1, 2 and 3.

5.3. Efficiency

Summary: Efficiency is fair. Inputs from both Japanese and Kenyan sides are basically provided as planned. However, the C/Ps, having many other duties, are not able to spend sufficient amount of time for project activities especially before the Mid-term Review, hence lowering the level of technical transfer from the Experts to the C/Ps. The plan for pilot projects at industrial facilities was cancelled in the first year and it took time to rearrange the project framework. Various key activities were delayed due to reasons such as solar PV pilot site re-identification to avoid grid extension, system troubles at solar PV systems and Lot 2 being in a remote area. Furthermore, Kenya's transition to the County System around mid-2013 required time to identify stakeholders and their roles and responsibilities regarding O&M of solar PV systems. On the other hand, collaboration with the JKUAT and BRIGHT Project is contributing to raised efficiency to a certain extent.

(1) Provision of inputs – the Japanese side

The interviews with the C/Ps have confirmed that the areas of expertise of the Experts are well addressing the needs of capacity development of the C/Ps and contributing to the generation of expected Outputs. The Experts have sufficient knowledge and skills not only in the area of systems design but also in the fields of finance, environment and community participation, which are equally important areas of expertise in developing appropriate rural electrification models and guidelines. As for the training for the C/Ps outside Kenya, the designs and contents of the training courses held in India and Thailand were particularly appropriate and appreciated by the C/Ps since they were able to have hands-on experience on a variety of renewable energy facilities in countries whose socio-economic situations and technology levels are quite similar to those of Kenya.

(2) Provision of inputs – the Kenyan side

Among the various inputs provided by the Kenyan side, the Project's office space located far from the C/P institutions caused inefficiency. Although the appointment of the C/Ps for each specific technology field was appropriately done, the C/Ps' demanding workload hampered effective technical transfer from the Experts to the C/Ps especially before the Mid-term Review. Timely completion of project activities is difficult from time to time and some activities had to be done

mostly by the Experts, without sufficient participation from the C/Ps.

(3) Contributing factors to efficiency

As already explained in "4.5.1 Factors which influenced the Project positively", collaboration with the JKUAT and Bright Project increased efficiency.

Further collaboration is now being planned where some C/Ps participate in the JKUAT's 9th Scientific, Technological and Industrialization Conference to be held in November this year.

The Project, on the other hand, accepted participants from the BRIGHT Project to come visit Iltumtum Primary School for training purposes, which facilitated information sharing between the two projects.

(4) Hindering factors to efficiency

The hindering factors to efficiency were already identified and explained in "4.5.2 Factors which stand as challenges to the Project". While each factor itself is giving considerable negative impact to smooth execution of project activities, the combination of these eight factors hindered efficiency as well as production of expected outputs to a considerable degree.

5.4. Impact

Summary: Impact is fair. The achievement level of the Overall Goal will largely depend on that of the Project Purpose. It will also depend on the practicality and replicability of the electrification models to be finalized in the remaining project period. Since there is a certain level of uncertainty regarding the achievement of the Project Purpose at the moment, the Overall Goal is also subject to uncertainty. Positive impacts of the Project are: (1) Stakeholders of renewable energy technologies increased their awareness regarding the high O&M cost and (2) It is likely that REA will discuss O&M issues with potential facility owners/users in future implementation of systems instalment. There are also impacts at the community-level which improved daily lives of the community members after the installation of solar PV systems at the pilot sites. For instance, personal security of female pupils and staff has improved with lighting at evening and night time. The community members, particularly women and children, are now enjoying improved public health services such as being provided better care during delivery at night and getting immunizations at local dispensaries. On the other hand, REA could not adopt some specifications suggested by the Project regarding the solar PV systems design for the Laptop Program due to time constraints, which, if realized, would have been a remarkable impact affecting as many as 3,000 primary schools in Kenya.

(1) Prospect of the achievement of the overall goal

The overall goal of the Project is "Rural electrification models using renewable energy are

disseminated in the country to improve the quality of Kenyan's life". The numerical targets for the Objectively Verifiable Indicators of the overall goal are "Number of public facilities who apply and follow the model has increased all over the non-electrified areas in Kenya" and "Dissemination structure of national and county governmental agencies is established."

The prospect of the achievement of the first indicator is that if the Project is able to present practical models to REA, there is a fair chance the number of public facilities applying the models will gradually increase throughout rural Kenya. In fact, discussions have started between the Expert team and REA regarding applying the model for the 2015/2016 REA solar PV projects. In particular, possibilities of applying the systems design and battery charging stations are discussed as the most probable "first step" towards utilization of the models.

As for the second indicator, the dissemination structure of national and county governmental agencies is in the process of being established by presenting a draft MOU on O&M of solar PV systems to the C/P organizations and related institutions such as MoH, MoEST and county governments. If these institutions endorse and sign the MOU with institutional commitment, their continuous efforts will lead to the establishment of a model dissemination structure.

It is surmised that if the project purpose is sufficiently achieved at the end of the cooperation period, the overall goal can be achieved likewise as long as the C/P organizations and related institutions continue to facilitate the dissemination of rural electrification models.

(2) Intended impact

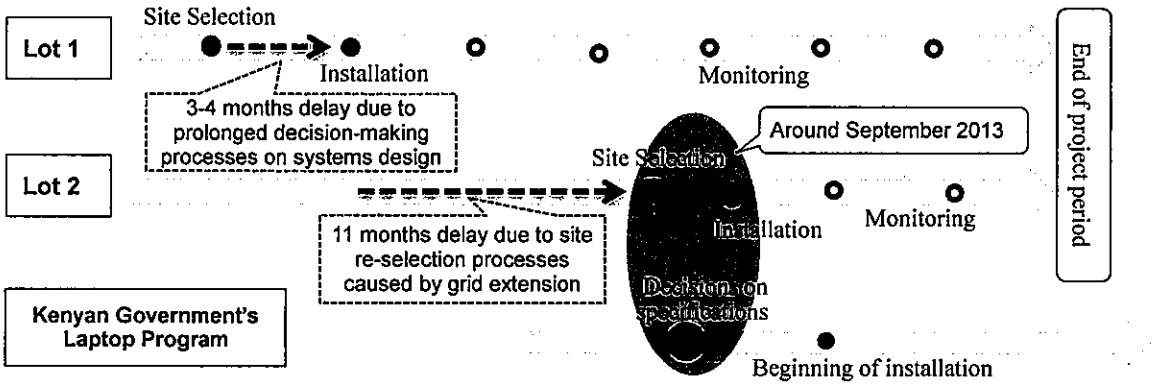
The impacts of solar PV systems installation at the community level include improved convenience of the users of the facilities such as that the school children can now study early in the morning or late in the evening. Personal security of the female pupils and staff has improved with lighting at evening and night times. Patients at the dispensaries can have better treatments or deliveries at night. Mothers can easily have their children immunized at local dispensaries where refrigerators for vaccines are kept. Undoubtedly, the Project is giving a positive impact on women and children in particular. On top of that, community people near the facilities can use the services of the battery charging stations and, as a result, their livelihoods are improving by increased convenience.

On the other hand, there is something worth mentioning regarding "unrealized" intended impact, so to speak. As has been already explained "4.3.1 Output 1", there were delays in installing solar PV systems at both Lot 1 and 2 schools and dispensaries. In retrospect, the eleven months' delay in Lot 2 subsequently led to missing the chance to make a great impact on solar PV systems at primary schools in rural Kenya. The Project team became very much occupied with preparing solar PV systems installation for Lot 2, after having finished selecting the pilot schools and dispensaries in September 2013. It was exactly around that time when REA became also busy deciding detailed specifications for solar PV systems under the Laptop Program. Although REA asked the Experts'

help in deciding the optimum system design, the Experts were too much pressed for time for their Lot 2 activities to respond to REA's request. For instance, the Experts later realized that the power voltage REA adopted as part of the specifications was not appropriate from a technical point of view. Despite REA's and the Experts' effort to modify the specifications from DC12V to DC 48V, it was too late to do so since the contractors, or solar PV systems installers, had already procured some materials based on the DC12V design[11]. The Experts feel that if the peak period of the Lot 2 activities had been several months earlier, they could have been worked together with REA to decide on the optimal specifications. This indicates that the eleven months' delay in selecting Lot 2 sites resulted in a critical negative consequence in that the Project missed the invaluable chance to make a nationwide impact on as many as 3,000 primary schools in terms of solar PV systems design.

Figure 4 illustrates critical timings of activities for the Project's Lot 1 and 2 and REA's Laptop Program. The shaded oval shape indicates when the Project was too busy with Lot 2 activities to assist REA in deciding specifications for laptop Program.

Figure 4 Timing of activities for the pilot projects and Laptop Program



(Source: The Evaluation Team)

(3) Unintended positive/ negative impact

Unintended negative impact was not observed by the evaluation team.

Some facilities began hair cutting services using electric hair clippers for enhancing the functions of the battery charging stations. Starting hair salons for women is also being considered at some facilities, which, if realized, would not only provide extra convenience to the local people but also offer community women a venue for socialization and social cohesion. These innovative ideas regarding the use of battery charging stations are considered to be unintended positive impact.

(3) The influence of external factors on the achievement of the overall goal

[11] REA, nevertheless, succeeded to have one contractor change their plan to install DC48V at two primary schools.

The identified external factors to influence the achievement of the overall goal in the PDM are: "REA Annual Renewable Energy Work Programme (Performance Contract) are prepared and implemented" and "Involvement of relevant national and county government is maintained". The former is the assumption that the solar PV models produced by the Project will be incorporated into the REA's departmental performance contract so that actual application of the models on the ground is made possible. The Project is now having discussions with REA about this incorporation and there is a chance that part of the models, specifically the battery charging system, will be introduced in REA's self-funded activities in future, if not next year. Since more inclusion of other elements of the models into the performance contract is advisable, the Project and REA are encouraged to continue discussing this issue.

The latter factor is directly linked to the issue of sustainability of the solar PV electrification model the Project is going to propose. At present, there is no solid guarantee that MoH, MoEST, and County Offices of these Ministries will be actively involved in the O&M of solar PV systems. However, constructive discussions have started with the initiative of the Project and REA. This issue will be taken up in "5.5 Sustainability" in detail.

5.5. Sustainability

Summary: Sustainability is fair. Presently, the level of policy and institutional sustainability is difficult to judge since REA is planned to be transformed into the National Electrification and Renewable Energy Authority (NERA). However, if the suggestions from the Project are incorporated into the current policies on renewable energy in future, policy sustainability will be high. The roles and responsibilities regarding the O&M of solar PV systems need to be further clarified and ensured among the national and county governments for better institutional sustainability. Technical sustainability is facing challenges because the C/Ps' practical skills has room for improvement compared with their theoretical knowledge in all four renewable energy technologies. Financial sustainability also needs to be improved, particularly for the appropriate O&M of solar PV systems, since the governments' budgets for pushing forward model dissemination is yet to be secured.

(1) Policy and institutional sustainability

As promised in REMP (2008-2018) and National Energy Policy (draft), REA and MoE&P will continue implementing policies on renewable energy. If the suggestions from the Project are incorporated into the current policies on renewable energy in future, policy sustainability will be high.

In the National Energy Policy, it is stated that REA will be "transformed into the National Electrification and Renewable Energy Authority (NERA) to become the lead agency in the

development of renewable energy resources[12]. When NERA is established, it will be NERA's responsibility to coordinate with national and county governments for implementation of rural electrification and renewable energy programmes. There is a likelihood that the Project's outputs will be eventually taken over by NERA but institutional arrangements for such transitions are still unclear.

The Project plans to galvanize REA, MoE&P, MoH, MoEST and county governments into their efforts to work on the O&M plans for the solar PV models. If this plan is carried out smoothly, through means such as having high-level dialogues for building a consensus and entering into MOUs, institutional sustainability will be higher.

(2) Technical sustainability

As the achievements of Output 1, 2 and 3 suggest, the C/Ps could not spend sufficient amount of time for receiving technical transfer from the Experts all through the cooperation period, except for one C/P on biogas. Although there is enough testimonials that the C/Ps all increased their theoretical knowledge on a variety of renewable energy technologies, their practical skills to apply the knowledge in actual projects on the ground are still not sufficient mainly due to their limited participation in activities in the field. As the Project is developing various guidelines which can serve as practical reference materials for strengthening the C/Ps' skills required in the field, REA and MoE&P are advised to make most use of such documents and improve the C/Ps skills and knowledge during and after the Project.

In order to raise technical sustainability both at the national and sub-national levels, REA's continuous collaboration with JKUAT and other related organizations with regard to capacity development trainings/ conferences will be beneficial. County-level stakeholders of MoH and MoEST should continue attending trainings on solar PV systems operation so that facility managers and operators will have enough skills and knowledge on solar PV systems.

(3) Financial sustainability

Financial sustainability should be examined at two levels. One is at the central level, i.e. the financial outlook of MoE&P/REA in leveraging the effects of the Project after the cooperation period. The other is at the local level where solar PV systems based on the developed model actually operate on a daily basis.

At the national level, MoE&P/ REA have various sources of funds for electrifying rural areas using renewable energy. For installation of solar PV systems, REA relies heavily on external sources which include loans and grants from international development partners such as the World Bank, Spain and French Agency for Development (AFD). Therefore, the financial prospects in

[12] Excluding geothermal and large hydros.

disseminating the models developed by the Project are largely dependent on the situations of projects implemented by other development partners. Still, disseminating and utilizing the models inherently do not require much additional financial resources. Application of the models in future REA projects should be financially feasible, though it may not be completely easy as it takes human resources particularly for planning, sensitizing, supervising and monitoring.

Perhaps financial challenges lie more at the local level. The pilot projects have revealed that much larger amount of money is required than previously assumed by REA for the O&M of solar PV systems. The Project is still in the process of discussing the issue about "who should bear such costs?" with both national and local level stakeholders. Strong involvement and commitment of MoH and MoEST as well as their County Offices are prerequisite for the successful O&M. Furthermore, the Ministry of Finance (national treasury) also needs to understand the necessity of O&M expenses and allocate sufficient budgets to the MoH and MoEST as requested. When all these institutions become financially committed to O&M of the solar PV system, not just the ten pilot systems installed by the Project but also all the future systems to be installed by REA, the models established by the Project will have high financial sustainability.

6. Conclusions

At the time of the Terminal Evaluation, the achievement level of the Project Purpose was fair. However, the achievement level will be higher if the remaining activities are completed successfully without delay in the remaining project period and appropriate action is taken in accordance with the recommendations proposed in this report.

The Project Team has been conducting planned activities despite the challenges of multiple adversities which contributed to lowering efficiency. There are still many issues to be addressed in the remaining implementation period until the Project can present practical and sustainable models. In particular, presenting optimal O&M mechanisms of solar PV systems requires obtaining understandings and agreement from relevant organizations. The Project will then need to give effective recommendations to C/P organizations, which should be authorized and endorsed, so that the models will take root at the C/P organizations. If these issues are addressed properly, the achievement level of the Project Purpose will be much higher.

The Project is advised to take action explained above as well as to follow recommendations presented in the next section. The Project should be completed in February 2015 as originally planned.

7. Recommendations

Recommendation to the Project (To be addressed in the remaining project period)

(1) Ensuring sustainability by establishing the O&M models

The Project should continue discussing the O&M models of solar PV systems with relevant institutions including MoH, MoEST, county governments and so forth so as to ensure sustainability of the solar PV systems. Having high-level dialogues and then entering into MOUs with relevant institutions is strongly recommended since it would officially promise institutional and financial commitment to the O&M models. Providing quantitative data on projected annual O&M cost, both total and itemized, by the Project to the prospective signees of the MOUs would facilitate informed decision-making at the signees' sides.

With regard to MoEST's institutional framework for O&M, an option such as giving a stronger facilitator role to County Education Offices is to be considered. The Offices could then effectively link the solar PV-installed schools and MoEST when the schools are in need of financial resources for solar PV O&M.

Furthermore, appropriate management and handling of cash generated from the battery charging business needs to be discussed in order to prevent possible misconduct at the facilities.

The proposed O&M models, on the other hand, should be authorized by the C/P organizations. Departments/persons responsible for continuous improvement of the models should also be identified and appointed.

(2) Conducting and presenting a quantitative analysis on applicability of the models

A quantitative analysis on applicability of the proposed models is recommended to be conducted and presented to REA/MoE&P. It is beneficial for the C/P organizations to be equipped with quantitative information on, but not limited to, (1) a projected scope of applicability of the proposed models to their future rural electrification plans, (2) the estimated number of applicable cases, and (3) required O&M costs. When conducting the quantitative analysis, site-selection criteria for battery charging stations need to be clarified also. Thus, the Project is advised to build upon its knowledge acquired through its experience on the pilot activities and propose most appropriate criteria.

(3) Formulating realistic policy recommendations

In order to complete the work for Output 4, which is about proposing recommendations on policy and institutional frameworks for rural electrification using renewable energy, the Project is advised to have close dialogues with relevant institutions regarding the proposed solar PV models. The Project, then, should formulate realistic policy recommendations and garner support for their implementation by the concerned institutions. It is important to facilitate active adoption of the proposed models by REA in future. Therefore, if the models are deemed effective in the Project Completion Report, application of the models is advised to be specified in REA's "Annual Renewable Energy Work Programme (Performance Contract)" as well as in the Rural Electrification Master Plan (REMP) at the time of updating. The Project and REA are encouraged to work on this

issue before the Project terminates.

(4) Working on intensive technical transfer with strong participation from the C/Ps

In order to fill the knowledge/skills gap, it is advised that the technical transfer from the Experts to C/Ps be undertaken actively during the remaining project period. Strong participation from the C/Ps in such activities is key for attaining satisfactory levels of technical transfer in each field of renewable energy technology. The C/Ps' participation includes, but not limited to, preparation and presentation of papers for the International Workshop to be held in February next year.

(5) Recording the achievements of the Objectively Verifiable Indicators, challenges and recommendations

At the time of the Terminal Evaluation, some of the key Objectively Verifiable Indicators in PDM have not reached their targets. They are expected to be attained in the next few months as the Project progresses. When writing the Project Completion Report to be submitted in February 2015, the achievement levels of those indicators should be clearly written so that an objective judgment of project performance can be made easily. Furthermore, remaining challenges and measures to be taken for raising sustainability should be discussed with the C/P and other related organizations and the results of the discussions should be delineated in the Project Completion Report.

Recommendation to the C/P institutions (To be addressed as medium- to long-term measures)

(1) Utilizing and improving the proposed models continuously

The C/P organizations are recommended to continue utilizing and improving the solar PV models proposed by the Project. Assignment of the departments/persons responsible for the coordination with relevant institutions is also recommended to make an institutional effort to improve the models.

(2) Utilizing and revising the guidelines continuously

As for MHP, biogas and wind technologies, pilot project implementation was cancelled in the first year of the project period. Thus, the C/Ps did not have a chance to experience the whole cycle of planning, analysis, system designing, installation and monitoring which are necessary for carrying out activities on the ground. The Project, instead, gave intensive training to the C/Ps and guidelines are being developed for future use. It is strongly recommended that the C/Ps will build on their training experience in the Project and leverage their increased knowledge in actual implementation of MHP, biogas and wind technologies in the field. In doing so, utilizing and revising the guidelines, including one on solar PV systems, should be conducted continuously. REA should be responsible for revising and updating the guidelines.

(3) Improving database on the Rural Electrification Master Plan (REMP)

Current database for the REMP needs to be improved making use of Geographical Information System (GIS). The improvement will help relevant organizations including development partners avoid duplication or overlap of future project sites. It will also facilitate easier decision-making concerning locations of future development.

(4) Exchanging knowledge and human resources with JKUAT

REA's and MoE&P's knowledge sharing and exchange with JKUAT have been proved to be beneficial. Continuous exchange of knowledge and human resources with JKUAT is advisable for strengthening capacity on renewable energy technology at REA and MoE&P. Such knowledge exchange includes, but not limited to, sharing REA's guidelines and other documents produced by the Project so that JKUAT can utilize them in their training courses. With regard to JKUAT's trainings on solar PV systems, regular attendance to such trainings by MoH, MoEST, and County Governments should be ensured.

(5) Improving basic skills for installation work of electrical facilities

It has been observed that the quality of basic installation work for wiring, switches, breakers, etc. was rather low. Thus, the responsible Expert became fully occupied with fixing those poor installations. Without the supervision of the Experts, most solar PV systems installed by local contractors may soon experience faults and malfunctions. In order to improve the quality of basic installation works, it is important for REA to compile detailed appropriate designs and rigorously supervise/ inspect the contractors' job accordingly.

8. Lessons Learnt

(1) Taking appropriate measures to minimize negative factors before and during the Project

There is no doubt that the current delay in producing sufficient outputs is largely attributable to many negative factors which are identified earlier in this report, "4.5.2 Factors which stand as challenges to the Project". There are as many as eight factors, both internal and external, which have been negatively influencing the Project throughout the implementation period. The project implementers should have made more efforts to identify and tackle these critical issues both before and during the project period so that unfavourable ramifications would be minimized. In some cases, drastic modifications on project design and modalities, including revision in project scope and change in the mode of expert dispatch, to name a few, could have been considered so as to best address major issues.

END

ANNEX 1: Study Schedule

	Date		Dr. Shuto (Evaluation/ Analysis)	Mr. Ogawa (Team Leader) Ms. Masuya (Cooperation Planning)
1	Sep.30	Tue	Narita 22:30 -	
2	Oct.1	Wed	- 03:20 Doha (OR807) Doha 12:15 - 17:30 Nairobi (QR1337)	
3	Oct.2	Thu	Interview with Eng.Ephantus Kamweru, Chief manager, Renewable Energy Department, REA (Project Manager) Interview with Ms. Judith Kimeu, Assistant Engineer, Renewable Energy Department, REA and Mr. Anthony Wanhara, Technician, Renewable Energy Department, REA (micro hydro power) Interview with Ms. Caroline Kelly, Assitant Officer, Renewable Energy Department, REA (biomass) Interview with Ms. Caroline Wambu, Assistant, Corporate Planning Department, REA (Finance) Interview with Ms. Lucy Muricho, Senior Communications Officer, Communications Department, REA Mr. Hannington Gochi, Senior Technician, Renewable Energy Department, REA (PV, Wind)	
4	Oct.3	Fri	Interview with Dr. Kepha M. Ombacho, Director, Public Health, Ministy of Health Interview with Mr. John K. Temba, Head of ICT for Education, Ministry of Education, Science and Technology Interview with Mr. Samson Kasanga, Assistant Director, Reneable Energy, MOE&P Interview with Mr.Bista Deepak (Project Expert)	
5	Oct.4	Sat	16:00 Interview with Mr. Otake from Bright Project	
6	Oct.5	Sun	Data compilation	
7	Oct.6	Mon	Site visit with a JICA Expert and Joint Evaluator 7:00 Nairobi - 11:30 Narok 13:00-14:00 Olkinyei Dispensary Stay in Narok	
8	Oct.7	Tue	Site visit with a Japanese Expert and Joint Evaluatior 9:00-10:00 Interview with Mr. Makori Antonym, County Director of Education's Office, Narok County Education Office 10:20-11:00 Interview with Dr. Peter Okoth , Director, Narok County Health Office, Mr. Daniel Sironga, County Public Health Officer, Narok County Health Office, Mr. Robert Mugwery, Deputy Sub-County Public Health Officer, Narok South Sub-County, Mr. Daniel Tubei,Bio Medical Engineering Technician, Narok North Sub-County 12:00-13:00 Iltumtum Primary School 14:00 Narok-17:00 Nairobi	
9	Oct.8	Wed	Data compilation	
10	Oct.9	Thu	Data compilation	Haneda 00:30-06:45 Dubai (EK313) Dubai 10:45-14:45 Nairobi (EK719) JICA Kenya Office
11	Oct.10	Fri	8:20 Courtesy Call to Mr. N'gang'a Munyu, Acting Chief Exective Officer, REA 10:20 Courtesy Call to Eng. Issac N. Kiva, Director, Renewable Energy, MOE&P PM:Internal meeting	
12	Oct.11	Sat	Internal meeting	
13	Oct.12	Sun	Data compilation	Site visit (Irkilinyeti from Lot1) with JICA experts
14	Oct.13	Mon	9:00 Meeting with JICA experts,JICA Kenya Office and the Evaluation team (at JICA Kenya Office) 16:00 Discussion on Draft Minutes of Meeting (M/M) including draft Joint Evaluation Report(JER) with C/P (Mr.Muriithi) and Joint Evaluator	
15	Oct.14	Tue	14:00 JCC-Sharing the outline of terminal evaluation result at JCC 18:30 Report to Jica Kenya Office	
16	Oct.15	Wed	AM: Signing of MM	
			Nairobi18:30→23:40Doha(QR1338)	Nairobi 16:40→22:40Dubai (EK720)
17	Oct.16	Thu	Doha01:45→17:55Narita(QR806)	Dubai02:50→17:35Narita (EK318)

ANNEX 2: Project Design Matrix (PDM) Version 3.1

appendix 1
PDM Version 3.1
Date:2013/10/15

Project Title: The Project for Establishment of Rural Electrification Model Using Renewable Energy

Implementing Agency: Rural Electrification Authority (REA) and Ministry of Energy and Petroleum (MoE&P)

Target Group: Staff of REA and MoE&P, MoEST, MoH, County/Sub-County Education/Medical Officers in pilot project sites, Members of pilot project school and dispensary management committee, Operators of charging business at pilot project facilities, Local PV suppliers and technicians, Staff and users of public facilities of pilot projects in pilot project sites, power users in rural areas

Project Site: Kijiado Central (1), Narok North (1), Narok South (2), Samburu Central (1), Samburu North (5)

Project Period: 2012– 2015 (3 years)

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
Overall Goal: Rural electrification models using renewable energy are disseminated in the country to improve the quality of Kenyan's life.	1. Number of public facilities who apply and follow the model has increased all over the non-electrified areas in Kenya. 2. Dissemination structure of national and county governmental agencies is established.	• Official reports of MoE&P/REA	Promotion measures and policies for rural electrification by renewable energy will be maintained, There will be no major changes in national and county government structures. Recommendations are adopted by relevant organizations.
Project Purpose: Rural electrification models using renewable energy are established	1. The developed guidelines and manuals are applied to the projects implemented by the REA and MoE&P (C/P). 2. The Outputs of the Project are incorporated into implementation of REA Annual Renewable Energy Work Programme (Performance Contract). 3. Renewable energy facilities installed by the Project are operated and maintained properly with sustainable. 4. Implementation structures of national/county governmental agencies and local stakeholders are established. 5. Variety of expertise in renewable energy is increased among members of C/P (C/Ps).	• Financial reports of the target facilities. • O&M records of the target facilities • User survey • Household survey • Numbers of expertise of C/Ps	REA Annual Renewable Energy Work Programme (Performance Contract) are prepared and implemented Involvement of relevant national and county government is maintained.
Outputs: 1. A practical model for PV electrification of health service institutions in non-electrified areas is developed through pilot projects.	0. All level 0-0 All sub-group working members for Output 1 participate in monitoring at least twice as a monitoring team member. 0-1 Monitoring trainings for the monitoring team members including both technical and environmental/community development staff at REA and MoE&P are provided based on their Objective & Achievement Sheet through OJT; On the Job Training. 0-2 At least 3 monitoring team members achieve their objectives through trainings. Achievements are confirmed by trainee's self-assessment and evaluation by Japanese Experts (JEs). 0-3 PV electrification, operation and maintenance manual for health service institutions with battery charging business is prepared for C/Ps including user manual and accounting manual. 0-4 At least 2 people from health institution and management committee as well as the operator of charging center are trained to have accurate understanding and to be able to conduct proper O&M of PV facilities including disposal of solar panels, batteries and toxic materials. 1. National Level 1-1 Collaboration among relevant governmental agencies is started and maintained at national level to support the establishment and dissemination of the model. 1-2 Key criteria of the site selection are analyzed and established and sites for Lot 1 and Lot 2 are selected accordingly. 2. County/Sub-county Level 2-1 Collaboration among C/Ps, County and Sub-county medical officers is initiated and maintained to support the establishment, operation and maintenance of the model. 3. Local/Institutional Level 3-1. The target health institutions secure the money from battery charging business and other financial source(s) for sufficient maintenance cost such as future purchase of batteries. 3-2. Periodical monitoring is carried out by the monitoring team at least 3 times for Lot 1 and twice for Lot 2. Satisfaction for the system is	• Project reports • Account book • Cash flow statement • Financial reports • O&M reports • Periodical monitoring report prepared by the monitoring team • Questionnaire survey • Objective & Achievement sheets of monitoring team members • PV electrification, operation and maintenance manual for health service institutions • Minutes of the meetings with relevant governmental agencies and County/Sub-county Medical officers.	There will be no major changes in national and county government structures.

	conformed through monitoring. 3-3. Awareness raising activities on installed solar PV system at target health institutions and community are held at least 3 times for each Lot 1 sites and 2 times for Lot 2 sites.		
2. A practical model for PV electrification of schools in non-electrified areas is developed through pilot projects.	0. All level 0-0 All sub-group working members for Output 1 participate in monitoring at least twice as a monitoring team member. 0-1 Monitoring trainings for the monitoring team members including both technical and environmental/community development staff at REA and MoE&P are provided based on their Objective & Achievement Sheet through OJT. 0-2 At least 3 monitoring team members achieve their objectives through trainings. Achievements are confirmed by trainee's self-assessment and evaluation by JEs. 0-3 PV electrification, operation and maintenance manual for schools with battery charging business is prepared for C/Ps including user manual and accounting manual. 0-4 At least 3 people from school and management committee as well as the operator of charging center are trained to have accurate understanding and to be able to conduct proper O&M of PV facilities including disposal of solar panels, batteries and toxic materials. 1. National Level 1-1 Collaboration among relevant governmental agencies is started and maintained at national level to support the establishment and dissemination of the model. 1-2 Key criteria of the site selection are analyzed and established and sites for Lot 1 and Lot 2 are selected accordingly. 2. County/Sub-county Level 2-1 Collaboration among C/Ps, County and Sub-county education officers is initiated and maintained to support the establishment, operation and maintenance of the model. 3. Local/Institutional Level 3-1. The target schools secure the money from battery charging business and other financial source(s) for sufficient maintenance cost such as future purchase of batteries. 3-2. Periodical monitoring is carried out by the monitoring team at least 3 times for Lot 1 and twice for Lot 2. Satisfaction for the system is conformed through monitoring. 3-3. Awareness raising activities on installed solar PV system at target schools and community are held at least 3 times for each Lot 1 sites and 2 times for Lot 2 sites.	• Project reports • Account book • Cash flow statement • Financial reports • O&M reports • Periodical monitoring report prepared by the monitoring team • Questionnaire survey • Objective & Achievement sheets of monitoring team members • PV electrification, operation and maintenance manual for schools • Minutes of the meetings with relevant governmental agencies and County/Sub-county Education officers.	
3. The Capacity of REA / MoE&P to undertake project using MHP, Biogas and Wind technologies is enhanced.	3-1. Training is conducted for at least 2 C/Ps for each renewable energy technology. 3-2. Guidelines are established for each renewable technology (MHP, Biogas and Wind). 3-3. Guidelines are utilized by relevant ministries, governmental agencies and County/Sub-county offices. 3-4. Seminar and training for technical transfer are conducted for C/Ps based on their Objective & Achievement sheets. 3-5. At least 6 C/Ps achieve their objective through training. Achievements are confirmed by trainee's self-assessment and evaluation by JEs. 3-6. At least one pre-feasibility study document for future practical model for MHP, Biogas and Wind is prepared.	• Prepared Guidelines • Project reports • Objective & Achievement sheets of trainees at REA and MoE&P	
4. Necessary policy and institutional frameworks for rural electrification using renewable energy are recommended.	4-1. International workshop is held to share the results of the project (e.g. EAC conference). 4-2. Technical transfer workshops for C/Ps are held 3 times. 4-3. Recommendations for C/P to implement the effective electrification by renewable energy are provided to be reflected on their rural electrification policy.	• Project reports • Presentation materials for International workshop. • Rural electrification policy of REA and MoE&P	

Activities:	Inputs (Means and Cost)	
For Preparation 1. Set up a Working Group (WG) consisting of 3 sub-groups for Outputs 1, 2 and 3, with clarified roles and functions of the counterpart personnel. For all Outputs 1. A weekly project status report is prepared and shared by both C/Ps and JEs. 2. Monthly project meeting is held by REA. 3. Progress report is prepared by JEs including the progress summary table according to PDM to monitor and report the progress of indicators to achieve outputs. For Output 1 (The health service institution model) 1-1 National Level 1-1-1 Review policies, studies, surveys and projects related to electrification of health service institutions using Solar PV. 1-1-2 Organize a progress and information sharing meetings with REA, MoE&P, and MoH at least twice to discuss on model establishment and dissemination at national level. 1-1-3 Prepare policy recommendations with institutional framework to promote the health institution model(s). 1-1-4 Prepare a proposal for the disposal of solar panels, batteries and toxic materials according to the current conditions and regulations. 1-2 County/Sub-county Level 1-2-1 Account book and cash flow statement are submitted to County Medical Officer(s) of the project sites at least twice for Lot 1 and once for Lot 2. 1-2-2 O&M reports are submitted to County Medical Officer(s) twice for Lot1 and once for Lot 2. 1-2-3 Organize a progress and information sharing meetings with REA, MoE&P (monitoring team members), and County and Sub-county medical officers at least twice to discuss on model establishment and dissemination at County/Sub-county level. 1-2-4 Conduct the baseline survey at the target facilities and surrounding communities 1-2-5 Conduct capacity & needs assessment of County/Sub-county medical officers in terms of renewable energy utilization and dissemination. 1-3 Local/Institutional Level 1-3-1 Conduct capacity & needs assessment of target communities and other stakeholders. 1-3-2 Sustainable financial plan is prepared. 1-3-3 Sufficient financial trainings for the operator of charging center, staff of health institution, and members of management committee are provided through lectures and OJT. 1-3-4 The operator of the charging center accurately records daily sale. 1-3-5 Assigned nurse, a treasurer and a chairperson of the management committee accurately records an account book and cash flow statement. 1-3-6 Assigned nurse and a chairperson of the management committee prepare O&M reports. 1-3-7 Identify and manage to obtain agreement with the agencies and/or organization to provide financial support to sustain the model according to the income by battery charging system. 1-3-8 Prepare detailed plans of the pilot projects including "System design" and "Sustainable O&M" with staff of REA and MoE&P through OJT. 1-3-9 Organize a stakeholder meeting with the members of management committee and owners of facility to discuss on operation and maintenance at least once for each pilot facility. 1-3-10 Organize an information sharing meeting with users of pilot facility and County/Sub-county medical officer(s) at least once for each pilot facility. 1-3-11 Organize an evaluation meeting with the members of management committee and owners and users of facility, County and Sub-county medical officers at the end of the project period at least once for each pilot facility. For Output 2 (School model) 2-1 National Level 2-1-1 Review policies, studies, surveys and projects related to electrification of schools using Solar PV. 2-1-2 Organize a progress and information sharing meetings with REA, MoE&P, and MoEST at least twice to discuss on model establishment and dissemination at national level. 2-1-3 Prepare policy recommendations with institutional framework to promote the school model(s). 2-1-4 Prepare a proposal for the disposal of solar panels, batteries and toxic materials according to the current conditions and regulations. 2-2 County/Sub-county Level 2-2-1 Account book and cash flow statement are submitted to County Education Officer(s) of the project sites at least twice for Lot 1 and once for Lot 2. 2-2-2 O&M reports are submitted to County Education Officer(s) twice for Lot1 and once for Lot 2. 2-2-3 Organize a progress and information sharing meetings with REA, MoE&P (monitoring team members), and County and Sub-county education officers at least twice to discuss on model establishment and dissemination at County/Sub-county level. 2-2-4 Conduct the baseline survey at the target facilities and surrounding communities 2-2-5 Conduct capacity & needs assessment of County/Sub-county education officers in terms of renewable energy utilization. 2-3 Local/Institutional Level 2-3-1 Conduct capacity & needs assessment of target communities and stakeholders. 2-3-2 Sustainable financial plan is prepared. 2-3-3 Sufficient financial trainings for the operator of charging center, staff of school, and members of management committee are provided. 2-3-4 The operator of the charging center accurately records daily sale. 2-3-5 Head teacher, a treasurer and a chairperson of the management committee accurately record an	Japanese Side A. Dispatch of Experts < Short-term Experts> • Team leader / Wind power generation • Sub leader / Rural electrification / Micro-hydro power • Photovoltaic power generation • Biomass/gas power generation • Financial management • Community Development and Monitoring • Procurement and supervision of pilot projects • Environmental and Social Considerations B. Training of Kenyan personnel (in Japan, in the third country) • Counterpart Training, and/or • Group Training Course for Rural Electrification by Renewable Energy C. Provision of Equipment. • Equipment for pilot projects of health service institutions • Equipment for pilot projects of schools Other equipment will be specified depending on the requirement for effective implementation of the Project. D. Local Cost (Seminars, meetings, trainings, local and international consultants, etc.) Kenyan Side: A. Assignment of counterpart personnel B. Provision of office space and facilities at REA (office for JICA experts and Working group members.) C. Allocation of counterpart budget	MoE&P and REA continue to be responsible for rural electrification in Kenya. Related ministries (MoH, MoEST,),agencies and county governments take part in the Project actively. Target communities, institutions, and private sectors agree the Project Purpose and take part in the Project actively. Security is maintained **Pre-conditions** Related ministries (MoH, MoEST,), agencies and county governments agree the Project Purpose and accept their roles in the Project implementation. Counterpart, budget, office space and facilities necessary for the Project are allocated

ANNEX 2-3

account book and cash flow statement. 2-3-6 Head teacher and a chairperson of the management committee prepare O&M reports. 2-3-7 Identify and manage to obtain agreement with the agencies and/or organization to provide financial support to sustain the model according to the income by battery charging system. 2-3-8 Prepare detailed plans of the pilot projects including "System design" and "Sustainable O&M" with staff of REA and MoE&P through OJT. 2-3-9 Organize a stakeholder meeting with the members of management committee and owners of facility to discuss on operation and maintenance at least once for each pilot facility. 2-3-10 Organize an information sharing meeting for the users of the pilot facility and County and Sub-county education officer(s) at least once for each pilot facility. 2-3-11 Organize an evaluation meeting with the members of management committee and owners and users of facility, County and Sub-county education officers at the end of the project period at least once for each pilot facility. <u>For Output 3 (MHP, Biogas and Wind)</u> 3-1. Conduct inventory and review of existing studies on MHP, Biogas and Wind. 3-2. Prepare guidelines for rural electrification using renewable energy (MHP, Biogas, Wind) according to the contents of the technical trainings in terms of planning, design, procurement, monitoring and maintenance. 3-3. Conduct technical training for REA / MoE&P staff on MHP, Biogas and Wind. 3-4. Carry out simple pre-feasibility study focusing on technical examination for MHP, Biogas and Wind. 3-5. Prepare technical recommendation for rural electrification using MHP, Biogas and Wind. 3-6. Collect necessary data and equipment for technical trainings and development of the guidelines. 3-7. Hold workshops for stake holders to validate guidelines on MHP, Biogas and Wind. <u>For Output 4 (Policy recommendations)</u> 4-1 Implement and monitor the preparation activities of policy recommendations of Output 1,2 and 3. 4-2 Organize workshop(s) on rural electrification models using renewable energy and/or present the results of the project by C/Ps at the domestic or international conference for information sharing with other stakeholders and donors in the energy sector of Kenya and East Africa. 4-3 Compile policy recommendations. 4-4 Initiate and strengthen the concept of Academic-Private Sector Platform in collaboration with JICA Experts of "the Project for Capacity Development for Promoting Rural Electrification Using Renewable Energy."		

ANNEX 3: Evaluation Grid

Lit= Literature review, Q= Questionnaire, Int=Interview, Ob= Observation

Aspects/ five evaluation criteria	Evaluation questions		Criteria & method for judgment	Required data	Information source	Data collection
	Question	Sub-question				
Performance	Achievement of inputs	Japanese side: Dispatch of experts, equipment/machinery, training in Japan and third countries, operation cost Kenyan side: Assignment of C/P, facilities, operation cost	Comparison with the plan	Data regarding inputs, opinions of the experts and CP	Project documents, JCC minutes, data regarding inputs, experts, CP	Lit, Int, Q
	Achievement of output 1: A practical model for PV electrification of health service institutions in nonelectrified areas is developed through pilot projects.	0. All level 0-0 All sub-group working members for Output 1 participate in monitoring at least twice as a monitoring team member. 0-1 Monitoring trainings for the monitoring team members including both technical and environmental/community development staff at REA and MoE&P are provided based on their Objective & Achievement Sheet through OJT; On the Job Training. 0-2 At least 3 monitoring team members achieve their objectives through trainings. Achievements are confirmed by trainee's self-assessment and evaluation by Japanese Experts (JEs). 0-3 PV electrification, operation and maintenance manual for health service institutions with battery charging business is prepared for C/Ps including user manual and accounting manual. 0-4 At least 2 people from health institution and management committee as well as the operator of charging center are trained to have accurate understanding and to be able to conduct proper O&M of PV facilities including disposal of solar panels, batteries and toxic materials. 1. National Level 1-1 Collaboration among relevant governmental agencies is started and maintained at national level to support the establishment and dissemination of the	Comparison with the indicator	Indicators, opinions of the experts and CP	Project documents, reports by experts, JCC minutes, indicators, experts, CP	Lit, Int, Q

Aspects/ five evaluation criteria	Evaluation questions		Criteria & method for judgment	Required data	Information source	Data collection
	Question	Sub-question				
		model. 1-2 Key criteria of the site selection are analyzed and established and sites for Lot 1 and Lot 2 are selected accordingly. 2. County/Sub-county Level 2-1 Collaboration among C/Ps, County and Sub-county medical officers is initiated and maintained to support the establishment, operation and maintenance of the model. 3. Local/Institutional Level 3-1. The target health institutions secure the money from battery charging business and other financial source(s) for sufficient maintenance cost such as future purchase of batteries. 3-2. Periodical monitoring is carried out by the monitoring team at least 3 times for Lot 1 and twice for Lot 2. Satisfaction for the system is conformed through monitoring. 3-3. Awareness raising activities on installed solar PV system at target health institutions and community are held at least 3 times for each Lot 1 sites and 2 times for Lot 2 sites.				
	Achievement of output 2: A practical model for PV electrification of schools in nonelectrified areas is developed through pilot projects.	0. All level 0-0 All sub-group working members for Output 1 participate in monitoring at least twice as a monitoring team member. 0-1 Monitoring trainings for the monitoring team members including both technical and environmental/community development staff at REA and MoE&P are provided based on their Objective & Achievement Sheet through OJT. 0-2 At least 3 monitoring team members achieve their objectives through trainings. Achievements are confirmed by trainee's self-assessment and evaluation by JEs. 0-3 PV electrification, operation and	Comparison with the indicator	Indicators, opinions of the experts and CP	Project documents, reports by experts, JCC minutes, indicators, experts, CP	Lit, Int, Q

Aspects/ five evaluation criteria	Evaluation questions		Criteria & method for judgment	Required data	Information source	Data collection
	Question	Sub-question				
		maintenance manual for schools with battery charging business is prepared for C/Ps including user manual and accounting manual. 0-4 At least 3 people from school and management committee as well as the operator of charging center are trained to have accurate understanding and to be able to conduct proper O&M of PV facilities including disposal of solar panels, batteries and toxic materials. 1. National Level 1-1 Collaboration among relevant governmental agencies is started and maintained at national level to support the establishment and dissemination of the model. 1-2 Key criteria of the site selection are analyzed and established and sites for Lot 1 and Lot 2 are selected accordingly. 2. County/Sub-county Level 2-1 Collaboration among C/Ps, County and Sub-county education officers is initiated and maintained to support the establishment, operation and maintenance of the model. 3. Local/Institutional Level 3-1. The target schools secure the money from battery charging business and other financial source(s) for sufficient maintenance cost such as future purchase of batteries. 3-2. Periodical monitoring is carried out by the monitoring team at least 3 times for Lot 1 and twice for Lot 2. Satisfaction for the system is conformed through monitoring. 3-3. Awareness raising activities on installed solar PV system at target schools and community are held at least 3 times for each Lot 1 sites and 2 times for Lot 2 sites.				
	Achievement of	3-1. Training is conducted	Comparison	Indicators,	Project	Lit, Int, Q

Aspects/ five evaluation criteria	Evaluation questions		Criteria & method for judgment	Required data	Information source	Data collection
	Question	Sub-question				
	output 3: The Capacity of REA / MoE&P to undertake project using MHP, Biogas and Wind technologies is enhanced.	for at least 2 C/Ps for each renewable energy technology. 3-2. Guidelines are established for each renewable technology (MHP, Biogas and Wind). 3-3. Guidelines are utilized by relevant ministries, governmental agencies and County/Sub-county offices. 3-4. Seminar and training for technical transfer are conducted for C/Ps based on their Objective & Achievement sheets. 3-5. At least 6 C/Ps achieve their objective through training. Achievements are confirmed by trainee's self-assessment and evaluation by JEs. 3-6. At least one pre-feasibility study document for future practical model for MHP, Biogas and Wind is prepared.	with the indicator	opinions of the experts and CP	documents, reports by experts, JCC minutes, indicators, experts, CP	
	Achievement of output 4: Necessary policy and institutional frameworks for rural electrification using renewable energy are recommended.	4-1. International workshop is held to share the results of the project (e.g. EAC conference). 4-2. Technical transfer workshops for C/Ps are held 3 times. 4-3. Recommendations for C/P to implement the effective electrification by renewable energy are provided to be reflected on their rural electrification policy.	Comparison with the indicator	Indicators, opinions of the experts and CP	Project documents, reports by experts, JCC minutes, indicators, experts, CP	Lit, Int, Q
Implementation process	Ownership of the CP organization	CP organization's involvement in project management	Activity record	Results of the questionnaire, activity record	Project documents, experts, CP	Lit, Int, Q
	Collaboration and communication with relevant organizations	How collaboration with related organizations is undertaken? Is communication among relevant organizations effective and smoothly undertaken?	Activity record	Results of the questionnaire, activity record	Project documents, experts, CP	Lit, Int, Q
	Methods of transferring technology	Is the method of transferring appropriate?	Activity record	Results of the questionnaire, activity record	Project documents, experts, CP	Lit, Int, Q
	Project management system	Are the systems of project monitoring, decision-making, communication within the project members appropriate?	Confirmation of project monitoring activities	Project documents, JCC minutes, opinions of the experts and CP	R/D, Project documents, reports by experts, JCC minutes, indicators,	Lit, Int

Aspects/ five evaluation criteria	Evaluation questions		Criteria & method for judgment	Required data	Information source	Data collection
	Question	Sub-question				
					experts, CP	
Relevance	Consistency with development policies of Kenya	Are the overall goal and project purpose aligned with the national development policies?	Development plans, priority areas	National and regional development policies	Policy documents, JICA Office, experts, CP	Lit, Int
	Consistency with Japan's foreign aid policy for Kenya	Is the project consistent with Japan's aid policy?	Japan's aid policy at present and at the time of project inception	Japan's aid policies for the target countries	Japan's aid policies, experts	Lit, Int
	Appropriateness of the target group setting	Is the selection of the target groups* appropriate? * Staff of REA and MoE&P, MoEST, MoH, County/Sub-County Education/Medical Officers in pilot project sites, Members of pilot project school and dispensary management committee, Operators of charging business at pilot project facilities, Local PV suppliers and technicians, Staff and users of public facilities of pilot projects in pilot project sites, power users in rural areas	Target groups' size and characteristics	Ex-ante evaluation, JCC minutes, opinions of the target groups, experts and CP	Ex-ante evaluation, JCC minutes, reports by experts, target groups, experts and CP	Lit. Int
	Congruency with the needs of the target group	Is the Project catering the needs of the target groups?	The extent of the project's matching needs	Existing study results such as questionnaires, needs analysis, opinions of the target groups, experts and CP	Project documents, reports by experts, JCC minutes, target groups, experts, CP	Lit. Q, Int,
	Japan's technological advantage	Is Japan's technological advantage well reflected in the services provided by the Project?	Comparison with similar services in the target countries	Training materials, questionnaire study results (on target groups), opinions of the experts and CP	Project documents, reports by experts, JCC minutes, target groups, experts, CP	Lit. Q, Int,
Effectiveness	Appropriateness of setting the project purpose, objectively verifiable indicators, numerical targets, means of verification	Are the project purpose, indicators, and means of verification appropriate?	Logical relations between the project activities and outputs, quality of data obtained from the means of verification	PDM, indicators, opinions of the experts and CP	PDM, indicators, experts, CP	Lit, Q, Int
	Achievement of the project purpose: "Rural electrification models using	1. The developed guidelines and manuals are applied to the projects implemented by the REA and MoE&P	Comparison with the indicator	Indicators, opinions of the target groups, experts and CP	R/D, Project documents, reports by experts, JCC minutes, indicators,	Lit, Int

Aspects/ five evaluation criteria	Evaluation questions		Criteria & method for judgment	Required data	Information source	Data collection
	Question	Sub-question				
	renewable energy are established."	(C/P). 2. The Outputs of the Project are incorporated into implementation of REA Annual Renewable Energy Work Programme (Performance Contract). 3. Renewable energy facilities installed by the Project are operated and maintained properly with sustainable. 4. Implementation structures of national/county governmental agencies and local stakeholders are established. 5. Variety of expertise in renewable energy is increased among members of C/P (C/Ps).			target groups, experts, CP	
	Promoting and hindering factors to the achievement of the project purpose	What are the promoting factors to the achievement of the project purpose?	Influence of the promoting factors on the achievement of the project purpose	Data on project activities (CP's policy directions, project's operation, decision-making), opinions of the experts and CP	R/D, Project documents, reports by experts, JCC minutes, indicators, target groups, experts, CP	Lit, Q, Int,
		What are the hindering factors to the achievement of the project purpose?	Influence of the hindering factors on the achievement of the project purpose	Data on project activities (CP's policy directions, staff turnover rates, project's finances), opinions of the experts and CP	R/D, Project documents, reports by experts, JCC minutes, indicators, target groups, experts, CP	Lit, Q, Int,
	The influence of external factors (important assumptions) on the achievement of the project purpose	How are the external factors influencing the achievement of the project purpose? How is the project coping with the factors?	The project's reaction to the external factors	Information on external factors (There will be no major changes in national and county government structures.), opinions of the experts and CP	R/D, Project documents, reports by experts, JCC minutes, indicators, target groups, experts, CP	Lit, Q, Int
Efficiency	Appropriateness of inputs	Inputs from Japan: Japanese experts	Quantity, quality, and timing of the inputs in comparison with the plan	Expertise, numbers of experts, dispatch duration, capacity	R/D, Project documents, reports by experts, JCC minutes, records of inputs, indicators, target groups, experts, CP	Lit, Q, Int,

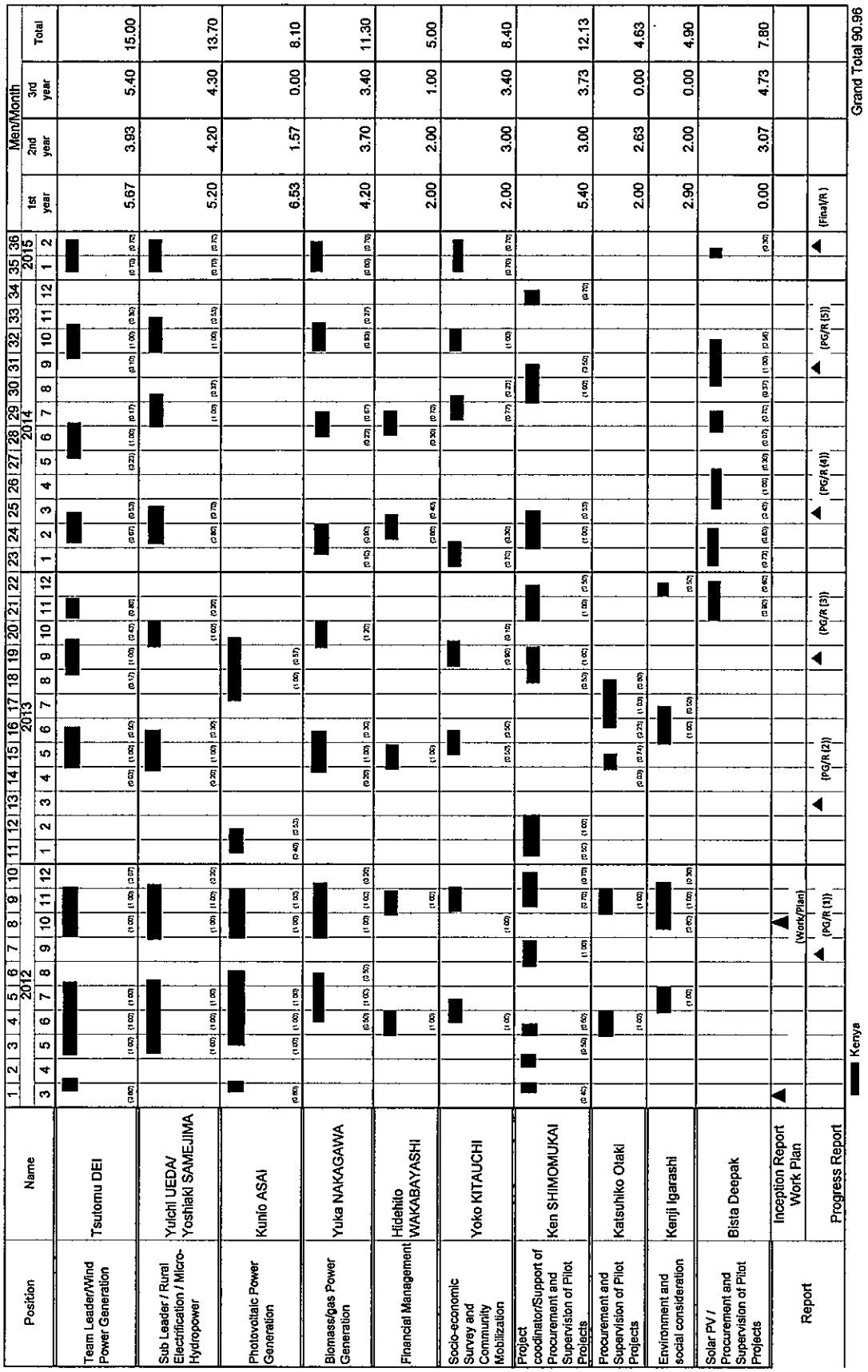
Aspects/ five evaluation criteria	Evaluation questions		Criteria & method for judgment	Required data	Information source	Data collection
	Question	Sub-question				
		Inputs from Japan: Equipment / machinery	Quantity, quality, and timing of the inputs in comparison with the plan	specifications, quantity, units, value, purpose	R/D, Project documents, reports by experts, JCC minutes, records of inputs, indicators, experts, CP	Lit, Q, Int, Ob
		Inputs from Japan: Training in Japan and the third countries	Quantity, quality, and timing of the inputs in comparison with the plan	Trainees' affiliations, number of trainees, training periods, contents of the training	R/D, Project documents, reports by experts, JCC minutes, records of inputs, target groups, trainees, experts, CP	Lit, Q, Int,
		Inputs from Japan: Operation cost	Quantity, quality, and timing of the inputs in comparison with the plan	Budget, expenses	R/D, Project documents, reports by experts, JCC minutes, records of inputs, experts, CP	Lit, Q, Int
		Inputs from Kenya: Assignment of counterpart personnel	Quantity, quality, and timing of the inputs in comparison with the plan	Number of staff, capacity	R/D, Project documents, reports by experts, JCC minutes, records of inputs, target groups, trainees, experts, CP	Lit, Q, Int,
		Inputs from Kenya: Office, work space and relevant facilities	Quantity, quality, and timing of the inputs in comparison with the plan	Conditions of the facility, opinions of the target groups, experts and CP	R/D, Project documents, reports by experts, JCC minutes, records of inputs, target groups, trainees, experts, CP	Lit, Q, Int, Ob,
		Inputs from Kenya: Operation cost	Quantity, quality, and timing of the inputs in comparison with the plan	Budget, expenses	R/D, Project documents, reports by experts, JCC minutes, records of inputs, experts, CP	Lit, Q, Int
	The level of outputs in relation to the inputs	Are the inputs producing sufficient levels of outputs?	Confirmation of inputs and outputs	Achievement of targets, opinions of the experts and CP	R/D, Project documents, reports by experts, JCC minutes, records of inputs, indicators,	Lit, Int, , Ob

Aspects/ five evaluation criteria	Evaluation questions		Criteria & method for judgment	Required data	Information source	Data collection
	Question	Sub-question				
					target groups, experts, CP	
	Progress of the Project	Is the Project implemented as scheduled?	Comparison between the plan and actual project activities	Project documents, opinions of the experts, CP and target groups	R/D, Project documents, reports by experts, JCC minutes, indicators, target groups, experts, CP, site visit	Lit, Q, Int, Ob
	Collaboration with other ODA projects	How does the Project collaborate with other ODA projects including Bridge Project?	Confirmation of collaborations established and/ or collaboration possibilities	Information on other projects (esp. Bridge Project)	Project documents, reports by experts, JCC minutes, target groups, experts, CP	Lit, Int,
	Promoting and/or hindering factors to efficiency	What are the promoting factors to efficiency?	Influence of the promoting factors on efficiency	Data on project activities, opinions of the experts and CP	R/D, Project documents, reports by experts, JCC minutes, target groups, experts, CP	Lit, Q, Int,
		What are the hindering factors to efficiency?	Influence of the hindering factors on efficiency	Data on project activities, opinions of the experts and CP	R/D, Project documents, reports by experts, JCC minutes, target groups, experts, CP	Lit, Q, Int,
Impact	Prospect of achieving the overall goal: "Rural electrification models using renewable energy are disseminated in the country to improve the quality of Kenyan's life."	Are the project activities expected to be sustainably implemented?	comparison with the indicator	Indicators, opinions of the experts and CP	Project documents, relevant statistics	Lit, Int,
	Unintended effects	Are there unintended effects (both positive and negative) the project has brought about?	Confirmation of unintended effects	Opinions of the target groups, experts and CP	R/D, Project documents, reports by experts, JCC minutes, target groups, experts, CP	Lit, Q, Int,
	The influence of external factors (important assumptions) on the achievement of the overall goal	How are the external factors influencing the achievement of the overall goal? How is the project coping with the factors?	Relations between the project and external factors	Information on external factors (REA Annual Renewable Energy Work Programme (Performance Contract) are prepared and implemented Involvement of	R/D, Project documents, reports by experts, JCC minutes, target groups, experts, CP	Lit, Q, Int

Aspects/ five evaluation criteria	Evaluation questions		Criteria & method for judgment	Required data	Information source	Data collection
	Question	Sub-question				
				relevant national and county government is maintained.), opinions of the experts and CP		
Sustainability	Institutional sustainability	CP's position in terms of national and regional policies	Confirmation of CP's position in the policy domain	opinions of the experts and CP	Project documents, reports by experts, JCC minutes, target groups, experts, CP	Lit, Q, Int
		CP's management and decision-making system	Confirmation of CP's management and decision-making system	Opinions of the experts and CP	Project documents, reports by experts, JCC minutes, target groups, experts, CP	Lit, Q, Int
		CP's direction in future	Confirmation of CP's direction in future	Opinions of JICA, Japanese embassy, the experts and CP	Project documents, reports by experts, JCC minutes, target groups, experts, CP	Lit, Q, Int
		CP's assignment of counterpart personnel	Counterpart staff's number, capacity, level of motivation, turnover rate	Opinions of the target groups, experts and CP	Project documents, reports by experts, JCC minutes, target groups, experts, CP	Lit, Q, Int
		Project management	Confirmation of operational management and monitoring	Opinions of the target groups, experts and CP	Project documents, reports by experts, JCC minutes, target groups, experts, CP	Lit, Q, Int
	Financial sustainability	CP's Budget for the project	Confirmation of CP's budget	CP's budget, financial data, opinions of the experts and CP	Project documents, reports by experts, JCC minutes, target groups, experts, CP	Lit, Q, Int
		Transparency of CP's finance	Confirmation of financial data	CP's budget, financial data, opinions of the experts and CP	Project documents, reports by experts, JCC minutes, target groups, experts, CP	Lit, Q, Int
	Technical sustainability	Counterpart personnel's technical skills	counterpart staff's level of technical skills	CP's activities, opinions of the experts and CP	Project documents, reports by experts, JCC minutes, target groups, experts, CP	Lit, Q, Int

Aspects/ five evaluation criteria	Evaluation questions		Criteria & method for judgment	Required data	Information source	Data collection
	Question	Sub-question				
		Operation/ training manuals	Quality of operation/ training manuals and frequency of use	Operation manuals for training and administration, opinions of the experts and CP	Project documents, reports by experts, JCC minutes, target groups, experts, CP	Lit, Q, Int
		Operation and maintenance of equipment and machinery	Confirmation of procedure of operation and maintenance of equipment and machinery	Information on operation and maintenance of equipment and machinery, opinions of the experts and CP	Project documents, reports by experts, JCC minutes, target groups, experts, CP	Lit, Q, Int
		Information management	Confirmation of information management	Confirmation on information management, opinions of the experts and CP	Project documents, reports by experts, JCC minutes, target groups, experts, CP	Lit, Q, Int

ANNEX 4: List of Project Experts



ANNEX 5: List of Counterpart Training in Japan and Third Countries

Overseas trainings for Counterpart members (C/Ps) conducted under the budget of Japanese side are listed below.

1. 1st Year Overseas training (in Japan) for C/Ps conducted under Japanese budget

Duration: 8/27/2012 – 9/19/2012
Content of Training: Renewable energy technologies
Operation and Maintenance of existing system
Appropriate technologies for rural electrification using renewable energy

	Name of Trainee	Position	Organization
1	Mr. Antony Wanjara Oredo	Renewable Energy and Generation, Technician	REA
2	Mr. Edwin Owiti	Renewable Energy Department, Engineer (I)	MOE&P
3	Mr. Jacob Chepkwony	Renewable Energy Department, Engineer (I)	MOE&P

2. 2nd Year Overseas training (in India) for C/Ps conducted under Japanese budget

Duration: 11/9/2013 – 11/22/2013
Main Visiting Institution: The Energy and Resources Institute (TERI)
Content of Training: Renewable energy technologies
Operation and Maintenance of existing system
Business Models
Appropriate technologies for rural electrification using renewable energy

	Name of Trainee	Position	Organization
1	Mr. Semekiah Ongonga	Renewable Energy Department, Assistant Engineer	REA
2	Ms. Caroline Kelly	Renewable Energy Department, Assistant Officer	REA
3	Ms. Peninah Karomoh	Renewable Energy Department, Environmental Scientist	REA
4	Mr. Dickson Musili	Renewable Energy Department, Principal Renewable Energy Assistant	MOE&P

3. 3rd Year Overseas training (in Thailand) for C/Ps conducted under Japanese budget

Duration: 8/2/2014 – 8/16/2014
Main Visiting Institution: School of Renewable Energy Technology, Naresuan University (SERT)
Content of Training: Renewable energy technologies
Operation and Maintenance of existing system
Appropriate technologies for rural electrification using renewable energy

	Name of Trainee	Position	Organization
1	Mr. Gilbert Gichunge	Renewable Energy Department, Training Engineer	REA
2	Mr. Hannington Gochi	Renewable Energy Department, Senior Technician	REA
3	Mr. Benson Mwakina	Renewable Energy Department, Senior Principal Superintending Engineer	MOE&P

ANNEX 6: List of Counterpart Personnel (C/P)

Project Director			
1	Mr. N'gang'a Munyu	Ag. Chief Executive Officer, REA	Renewable energy in general
Project Manager			
2	Eng. Ephantus Kamweru	Chief Manager, Renewable Energy Department, REA	Renewable energy in general
3	Eng. Isaac N. Kiva	Senior Principal Superintending Engineer (RE), MOE&P	Renewable energy in general
Working Group			
4	Mr. James Muriithi	Senior Engineer, Renewable Energy Department, REA	Renewable energy in general
5	Mr. Hannington Gochi	Senior Technician, Renewable Energy Department, REA	PV, Wind
6	Mr. Anthony Wanjara	Technician, Renewable Energy Department, REA	MHP (PV)
7	Ms. Colleta Koech	Assistant Engineer, Renewable Energy Department, REA	PV, Wind
8	Ms. Caroline Kelly	Assistant Officer, Renewable Energy Department, REA	Biogas
9	Mr. Gilbert Gichunge	Project supervisor, Renewable Energy Department, REA	Biogas
10	Mr. Semekiah Ongong'a	Assistant Engineer, Renewable Energy Department, REA	MHP
11	Ms. Judith Kimeu	Assistant Engineer, Renewable Energy Department, REA	MHP
12	Ms. Peninah Karomoh	Environmental Scientist, Renewable Energy Department, REA	Environment
13	Ms. Eunice Wambui	Economist, Corporate Planning Department, REA	Finance
14	Ms. Lucy Muricho	Senior Communications Officer, Communications Department, REA	Community Development
15	Mr. Samson Kasanga	Assistant Director, Renewable Energy, MOE&P	PV, Renewable energy in general
16	Mr. Jacob Chepkwony	Assistant Engineer, Renewable Energy, MOE&P	PV, Renewable energy in general
17	Mr. Edwin Owiti	Assistant Engineer, Renewable Energy, MOE&P	PV, Wind
18	Mr. Mungai Kihara	Engineer, Renewable Energy, MOE&P	Wind
19	Mr. Dickson Kisoa	Principal Renewable Energy Assistant (RE), MOE&P	PV, Renewable energy in general

ANNEX 7: List of Provided Machinery and Equipment

(unit: KSh)

	Item	Specification	Units	Cost
1	Desktops	HP	3	342,000
2	Photocopy Machine	S/NFAJ11641 (2020L)	1	380,000
3	Auto Cad	LT 2013	1	95,000
4	Satellite Phone	Thuraya XT	1	255,351
5	Projector	Epson ES01 2600 Lumens	1	56,000
6	UPS	1500KVA Mercury Smart	3	42,000
7	Printer	HP P 3015DN	1	55,000
8	GPS	Garmin eTrex30	1	35,230
9	Clamp Meter	KEW MATE 2012R	2	32,641
10	Current Meter	UC-200V No. 2329	1	503,553
11	pH Meter	M610T	1	7,068
12	ORP Meter	RM-30P	1	68,913
13	Methane Gas Detector	XP-3140	1	186,595
14	Laser Distance Meter	GLM 80	1	25,163
15	Refractometer	RHA-200ATC	4	34,970
			Total	**2,119,484**

Project for Establishment of Rural Electrification Model Using Renewable Energy

Title : 3rd JCC Meeting **Venue: 23F, Nyayo house**	
Meeting Called By	JICA Expert Team
Type Of Meeting	Project Management Meeting
Date & Time	14th October 2014 / 14:00-16:00
List Of Attendees	1. Eng. Joseph Njoroge - MoE&P (Chairing) 2. Eng. Isaac Kiva - MoE&P (Co -Chairing) 3. Eng. Samson Kasanga - MoE&P 4. Mr. Ng'anga Munyu – REA 5. Eng. Ephantus Kamweru- REA 6. Eng. James Muriithi - REA 7. Judith Kimeu-REA (Secretary) 8. Semekiah Ongong'a-REA 9. Evans Njenga- JICA Kenya 10. Koji Noda- JICA Kenya 11. Tadatuki Ogawa-JICA HQ 12. Masuya Yuki-JICA HQ 13. Kumiko Shito-JICA evaluation team 14. Tsutomu Dei – JET 15. Yuka Nakagawa- JET 16. Ken Shimomukai- JET 17. Deepak Bista- JET 18. Yoshiaki Samejima- JET
Agenda	1. Welcome address from principle secretary (MoE&P) and chair JCC JICA/REA Project 2. Confirmation of 2nd JCC Minutes 3. Overall Progress in Project implementation 4. Terminal project evaluation 5. Work Plan 6. Update of Management issues of JICA/REA project 7. AOB 8. Concluding Remarks

SUMMARY OF DISCUSSION

1. Welcoming address from principle secretary (MoE&P) and chair JCC JICA/REA Project

After a round of introduction the chair welcomed members to the 3rd JCC meeting. The chair thanked the government of Japan for their support in the areas of rural electrification. In the areas of access the chair informed the members that currently the access rate is 32% and the Last Mile Connectivity Project (LMCP) was a government initiative to increase the access rate to 75%-80%. The chair requested JICA support in the LMCP and said he was awaiting announcement from the Japanese government for any support.

2. Confirmation of 2nd JCC minutes

Eng. Kiva confirmed the minutes of the previous meeting to be true.

The confirmation was seconded by Dr Dei.

3. Overall Progress in Project implementation

Eng. Kamweru presented to the meeting a summary of the overall project progress.

The meeting was informed 2 schools and 2 dispensaries were installed in Lot 1 and 3 schools and 3 dispensaries in Lot 2 (including rehabilitation in 2 dispensaries). A total of 10 institutions were installed with solar PV during the project time, and monitoring was currently ongoing. Technical transfer is ongoing.

PROJECT FOR ESTABLISHMENT OF RURAL ELECTRIFICATION MODEL USING RENEWABLE ENERGY IN THE REPUBLIC OF KENYA

LOT 1	COUNTY	INSTITUTION	INSTALLED CAPACITY	STATUS
	Narok 2 schools 1 Dispensary	Iltumtum Primary School	3360 Watts	Completed and being monitored
		Olemoncho Primary School	2640 Watts	Completed and being monitored
		Olkinyei Dispensary	800 Watts	Completed and being monitored
	Kajiado 1 Dispensary	Ilkilnyeti Dispensary	1680 Watts	Completed and being monitored
LOT 2	Samburu 3 schools	Illaut Primary School	4800 Watts	Completed and being monitored
		Tuum Primary School	5040 Watts	Completed and being monitored
		Marti Primary School	6480 Watts	Completed and being monitored
	Samburu 3 Dispensary	Angata Nanyokei Dispensary	720 Watts	Completed and being monitored
		South Horr Dispensary	480 Watts	Completed and being monitored
		Latakweny Dispensary	2400 Watts	Completed and being monitored

CAPACITY DEVELOPMENT ON MHP, BIOGAS AND WIND TECHNOLOGIES

In REA the following were involved in technical transfer with Japanese Experts.

MICRO HYDRO POWER	2 Officers
BIOGAS	2 Officers
SOLAR/WIND	2 Officers
ENVIROMENT	1 Officer

Eng. Kamweru reported that operation and maintenance of the projects was a challenge to the institutions and empowerment of the locals in O&M was key to the success of the project. It was resolved that more people should be trained.

4. Terminal project evaluation

The JICA Evaluation Team gave a presentation on the evaluation results and emphasized on the need to speed up the pending activities in output 1-4. Operation and maintenance model was emphasized and the members present emphasized that a discussion with the relevant ministries should be done to ensure that the overall objective of the project is achieved.

JICA Expert Team (JET) presented to the members present the operation and maintenance model for dispensary, operation and maintenance model for schools, financial model, renewable energy technical assistance and grid connection study.

5. Work Plan

With less than six (6) months to the closure of the project, JET and the counterpart team were advised to come up with a work plan on how the pending activities will be completed before February 2015 to enable the project to achieve its objective.

6. Update of Management issues of JICA/REA project

The members present were informed that a lot of improvement has been noted from the 2nd JCC meeting and concerns raised have been dealt with within the monthly meetings.

7. AOB

- International Workshop

The members present were informed that the tentative days for the workshop were mentioned as February 2nd to 6th 2015. The location was proposed to be in Nairobi but there was a proposal from the meeting for the venue to be in Naivasha. The list of participating countries was shared and there was a request for South Sudan to be included and also for the project to invite a country that has done well in renewable energy (Morocco). JET will discuss with JICA about the possibility of those proposal and requests.

- Guideline Validation Workshop and JKUAT Technical Conference

JET reminded about validation workshop of guideline and JKUAT technical conference scheduled in November 2014 as a part of technical transfer activity, and requested full participation of counterpart staffs.

8. Concluding Remark

Mr. Ng'anga Munyu (Ag. CEO, REA) said he was in agreement with the evaluation report and emphasized on the need to follow and implement the recommendations given in the report to make the project a success.

The chairman concluded the meeting by thanking all the members for the cooperation and also coming to the meeting.

END

Attendant List

Project for Establishment of Rural Electrification Model using Renewable Energy in Kenya

Meeting Title: 3rd JCC Meeting
Venue: Nyayo House 23rd Floor Date: 2014/10/14 Time: 14:30pm

SN	Name	Organization	Title	Mobile or E-mail	Signature
1	Eng Joseph Kinyanjui	MOEP	PS	[redacted]	
2	Eng Isaac Kiva	MOEP	DRE		
3	Dyanga Munya	REA	Ag. CEO		
4	Eng KIHAWTUS IGATUMBU	REA	CMRE		
5	Eng. James Murithi	REA	SNR ENGINEER		
6	Eng. Samson Kasenge	MOEP	ADRE		
7	Judith Kimeu	REA	Engineer		
8	Semekiah Onyonga	REA	Engineer		
9	Ken Shimomura	JET	Coordinator		
10	Yuka NAKAGAWA	JET	Biogas/Grid Connection		
11	DEEPAK BISTA	JET	PV Technology		
12	Yoshiaki SAMEJIMA	JET	Deputy T/L & MHP Techn		
13	TSUTOMU DEE	JET	Team Leader/Wind		
14	Evanson Njeru	JICA	Consultant		
15	Kumiko Shuto	JICA Terminal Evaluation	Consultant		
16	Masuya Yuki	JICA HQ	Project Office		
17	TADAYUKI OGAWA	"	Senior Advisor		
18	Koji NODA	JICA Kenya	Sr. Rep.		
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