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IMPLEMENTATION COMPLETION AND RESULTS REPORT

TF 0A2550

ON A

SMALL GRANT

IN THE AMOUNT OF US\$ 4.27 MILLION

TO THE

Energy4Impact

FOR

AFCC2/RI SECOND ENERGY SMALL & MEDIUM ENTERPRISES (ESME) SUPPORT
PROJECT (P154495)

August 28, 2019

Energy and Extractives Global Practice
Africa Region

ABBREVIATIONS AND ACRONYMS

APROVAG	Association Des producteurs de banana de la vallee du fleuve Gambie (Banana Growers Association of the Gambia River Valley)
ASER	Senegalese Rural Electrification Agency
CAS	Country Assistance Strategy
CPIA	Country Policy and Institutional Assessment
CPS	Country Partnership Strategy
CQS	Consultant's Qualification
DC	Direct Contracting
E4I	Energy 4 Impact (formally GVEP)
EBD	Energy Business for Development
ESME	Energy Small and Medium Enterprises
FM	Financial Management
GVEP	Global Village Energy Partnership
IBRD	The International Bank for Reconstruction and Development
IC	Individual Consultants
IDA	International Development Association
IFIs	International Financial Institutions
IFR	Interim Financial Report
kW	Kilowatt
kWh	Kilowatt-hours
LCS	Least cost selection
M&E	Monitoring and Evaluation
MSME	Micro and Small and Medium Enterprises
MW	Megawatt
PAYGO	Pay-As-You-Go
PDO	Project Development Objective
PNB	Programme Nationale de Biogas (National Biogas Program -Senegal)
PREMS	Projets Energetiques Multi-Sectoriels (Mult-sectoral Energy Projects -Senegal)
PUE	Productive Use of Energy
QCBS	Quality and Cost Based Selection
REA	Rural Energy Agency (Tanzania)
SE4ALL	Sustainable Energy for All
SSA	Sub Saharan Africa
SSS	Single Source Selection
TOR	Terms of Reference

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DATA SHEET

BASIC INFORMATION

Product Information

Project ID	Project Name
P154495	AFCC2/RI Second Energy Small &Medium Enterprises(ESME) Support Project
Country	Financing Instrument
Africa	Investment Project Financing
Original EA Category	Revised EA Category

Organizations

Borrower	Implementing Agency
Energy4Impact	Energy4Impact

Project Development Objective (PDO)

Original PDO

The project objective is to strengthen the capacity of small and medium enterprises to provide access to energy in selected countries in Sub-Saharan Africa.

FINANCING

	Original Amount (US\$)	Revised Amount (US\$)	Actual Disbursed (US\$)
Donor Financing			
TF-A2550	4,267,902	4,249,661	4,249,661
Total	4,267,902	4,249,661	4,249,661
Total Project Cost	4,267,902	4,249,661	4,249,661



KEY DATES

Approval	Effectiveness	Original Closing	Actual Closing
31-May-2016	31-May-2016	28-Aug-2017	28-Feb-2019

RESTRUCTURING AND/OR ADDITIONAL FINANCING

Date(s)	Amount Disbursed (US\$M)	Key Revisions
21-Aug-2017	2.47	Additional Financing Change in Results Framework Change in Components and Cost Change in Loan Closing Date(s) Change in Implementation Schedule
23-Aug-2018	4.17	Additional Financing Change in Components and Cost Change in Loan Closing Date(s) Change in Implementation Schedule
29-Nov-2018	4.17	Change in Loan Closing Date(s)

KEY RATINGS

Outcome	Bank Performance	M&E Quality
Satisfactory	Satisfactory	Substantial

RATINGS OF PROJECT PERFORMANCE IN ISRs

No.	Date ISR Archived	DO Rating	IP Rating	Actual Disbursements (US\$M)
01	27-Oct-2016	Satisfactory	Satisfactory	1.17
02	04-Aug-2017	Satisfactory	Satisfactory	2.30
03	19-Apr-2018	Satisfactory	Satisfactory	3.81
04	12-Apr-2019	Satisfactory	Satisfactory	4.17



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I. PROJECT CONTEXT AND DEVELOPMENT OBJECTIVES

Context

1. At the time of appraisal of the project in 2016 only 35 percent of the population in Sub-Saharan Africa (SSA) had access to electricity, that is, an estimated 589 million people in SSA had no access to electricity. Across large areas on the continent, electricity remained unaffordable, unreliable and inaccessible. The lack of access to electricity was one of the many reasons contributing to the overall high poverty levels. The United Nations declared the decade 2014-2024 as the Decade of Sustainable Energy for All (SE4ALL), thus underscoring the importance of energy issues for sustainable development, with the objective to achieve universal access to modern energy by 2030. Most governments in SSA had insufficient financial resources to meet the enormous needs of the investments necessary to maintain sound electricity networks while expanding them to include their population centers. Many remote locations could not readily be supplied by the national network, opening the opportunities for micro-grids, mini-grids, and stand-alone solar systems to fill the gap. Despite several initiatives by the Bank, other IFIs, donors, NGOs and the governments, little measured progress had been achieved towards the goal of energy access at that time, as population growth exceeded progress in energy access across most of SSA.

2. The World Bank maintained a strong commitment towards strengthening and expanding access to modern energy across SSA. Apart from financing the mainstream projects targeting the public sector utilities in the power sector, it considered the importance of supporting small, private sector power generators and distributors as essential to meet the overall goal of universal access. To better enable electrification and to promote the actual use of this power once it reached village areas, micro, small and medium enterprises (MSMEs) emerged as a key player to engage in the electrification process. The initiative for Energy Small and Medium Enterprise (ESME) Support in SSA was launched by the Bank to engage small and medium enterprises towards increased energy access in a few SSA countries. It was considered that MSMEs were a key source of employment and income generation in newly electrified areas, whether they were conventionally electrified by national grid or by mini-grids. Support to spur the growth of these MSMEs effectively contribute to increased sales of their energy related products and thus increased access to energy. Besides, increased productive use of energy not only helps the electricity consumers to generate income, but also provides better return to the utility or mini-grid operators. In March 2009, the Government of Russia established a US\$ 30 million Trust Fund ("Parent Fund" - TF-071223) to support energy access in SSA countries which was administered by the World Bank. The Global Village Energy Partnership (GVEP), initially a partnership initiated by UNDP and the World Bank with support of bilateral donors emerged as a key agency to support and implement energy access initiatives in these countries. By 2006, the GVEP's initial structure as a partnership evolved to become GVEP, International, an independent non-profit organization, registered in UK. Upon entering the second phase of its operations, GVEP International changed its name to Energy for Impact (E4I) to better reflect its impact and focus.

3. The ESME-SSA (P115401), approved on March 19, 2009 was the first project to finance MSME enterprises from a Recipient Executed Trust Fund (TF-094542), which was funded from TF-071223 (Parent). A Grant Agreement between the World Bank and GVEP International was signed on June 19, 2009. The ESME-SSA project with a total funding envelope of US\$ 10.2 million was aimed to foster local private sector entrepreneurship and investment in the provision of energy services in remote, un-served and under-served regions within some of the SSA countries. The project, which closed on October 31, 2014 played a constructive role in strengthening energy services to poor communities in SSA and facilitated establishment of energy-SME programs in each participating country, namely Kenya, Tanzania, Uganda, Rwanda, Mali



and Senegal. It also promoted rural electrification investments undertaken by private sector entities. The ESME-SSA project extended financing and technical assistance to SMEs in those countries to strengthen their capacity in providing energy services to poor communities. The components of the project were technical assistance and advisory services to SMEs, rural energy agencies (REAs) and other local private funds. It further included financing of small sub-grants administered by the implementing agency; modifying the safeguard category of the project to consider the potential environmental and social impact of new activities. The ESME-SSA project provided useful intervention to MSMEs in Kenya, Tanzania, Uganda, Rwanda, Mali¹ and Senegal, which established a significant role for MSMEs in the energy access landscape of these countries. However, in case of Mali following a coup in 2012 and emerging risk to the project towards achieving its objectives, the project activities had to be suspended in the country. The ESME-SSA project accomplished a satisfactory rating, which was confirmed by IEG.

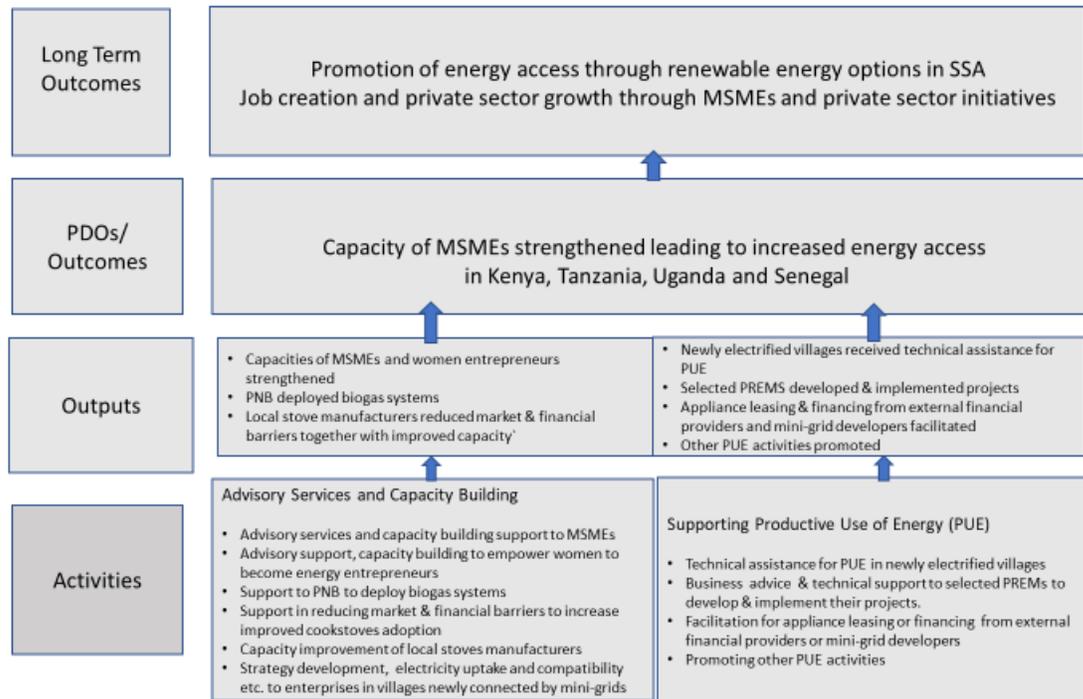
4. Building on the successful achievement of the ESME-SSA project and lessons learned, a second project was designed for supporting energy access in selected SSA countries - a logical extension of the initiative under its predecessor project. The second ESME project, with a relatively limited budget was thus directed towards fewer countries. Results achieved by the predecessor ESME project justified inclusion of Kenya, Tanzania, Uganda and Senegal as beneficiaries. Inclusion of Senegal was done to include a Francophone country so that the experience could be gained in a country with significantly different set of conditions. Mali had to be excluded in the project given the poor security situation in the country. In Rwanda, although the predecessor ESME project was found effective, at the time of preparation for this project (i.e. ESME 2), similar initiatives were launched for Rwanda by other donors. It was thus found appropriate to exclude Rwanda in the ESME 2 project. The proposed project was strategically aligned with the existing World Bank Group's Country Assistance Strategy (CAS) or Country Partnership Strategy (CPS) for these four SSA countries (Kenya, Tanzania, Uganda and Senegal), which highlighted the promotion of an environment for capacity building and strengthening of MSMEs capability. Effectively a regional project, the overarching objective of the new project was to create conditions that incentivize the private sector and expand the capacity of MSMEs in promoting energy access in these countries. The second ESME project was funded from the Recipient Executed Trust Fund (TF-0A2550), with the exception that the supervision budget was funded by TF-0A2549, a Bank Executed Trust Fund. These two trust funds were financed by the parent trust fund (TF- 071223). The grant agreement was signed on May 20, 2016. Project's focus was to support small businesses to both supply electricity in rural areas and to make use of energy in small businesses in these newly-electrified areas. Its development objective was targeted to increase sales by the micro, small and medium energy enterprises reached by the project and indirect project beneficiaries that had improved access to energy by this project. The project would help the policies of the governments for private sector development and job creation. In keeping with the design of the ESME-SSA project, implementation of the project was entrusted to E4I (previously GVEP).

5. Theory of Change. The project paper didn't include any description of the theory of change or results chain for the project. As part of this report, Figure 1 below represents the theory of change linking the project inputs, outputs, project objectives and outcomes as identified at appraisal.

¹ It may be noted the Bank's operations had been stopped on June 30, 2012 in Mali due to political instability and a military coup.



Figure 1: Theory of Change Diagram



Project Development Objectives (PDOs)

6. The objective of the Project is to strengthen the capacity of small and medium enterprises to provide access to energy in selected countries of Sub-Saharan Africa.

Key Expected Outcomes and Outcome Indicators

7. The main PDO level results indicators of the project for the four participating countries (namely Kenya, Tanzania, Uganda and Senegal) were:

- Increased sales by the micro, small and medium energy enterprises reached by the project;
- Indirect project beneficiaries that have improved access to energy (number).²

8. In addition, the following intermediate level indicators were established for tracking the progress of other project activities.

- Increased sales by female headed micro, small and medium energy enterprises reached by the project.
- Number of biogas units sold.
- Number of schools with improved cookstoves.
- Number of PREMs units successfully delivered.

² Sales volume figures is collected from supported businesses and an estimated number of indirect beneficiaries based on that will be made (e.g. X stoves to households of average size of Y people).



- Numbers of enterprises supported in villages newly connected by ASER's mini- grid program.

Components

9. Project consists of the following components:

- A. Component 1: Advisory Services and Capacity Building Support for Energy Sector Micro, Small and Medium Enterprises. (Original Amount. US\$ 2,000,308; Revised Amount. US\$ 2,619,627)

Support MSMEs in the renewable energy sector to develop their supply chain and route-to- market strategies, and to access finance required for growth. The activities include:

- (a) Provision of advisory services and technical capacity building of selected MSMEs through business planning techniques, sales and marketing, strategic and financial planning, supply chain and operational management.
- (b) Support for selected women to become energy entrepreneurs in rural areas, including development and growth of small and renewable energy projects.
- (c) Support to deploy biogas systems for rural households by providing business advice and technical assistance related to selected biogas activities.
- (d) Engagement with cookstove manufacturers, schools, and financial institutions to reduce market and financial barriers to increase adoption of improved cookstoves for schools.

- B. Component 2: Supporting Productive Use of Energy. (Original Amount. US\$ 834,438; Revised Amount US\$ 1,019,312)

Support selected MSMEs to design, develop and implement energy projects and encourage the productive use of energy and its benefits. The activities include:

- (a) Carrying out set of activities for productive use of electricity in selected villages.
- (b) Engagement with the Senegalese Rural Electrification Agency (ASER) to provide technical assistance for productive use of energy in newly electrified villages
- (c) Assistance to selected Projects Energetiques Multi-Sectoriels (PREMS – multisector, energy SMEs) requiring business and technical support to develop and implement their projects (Senegal).

- C. Component 3: Project Management (Original Amount US\$ 395,155, Revised Amount. US\$ 628,963)

This component will cover cost associated with the coordination of the projects in the selected countries as well as monitoring and evaluation (M&E), financial management, procurement, environmental and social management, and general administration and logistics.

10. **Result Indicators.** No changes took place in the PDOs. The targets of result indicators were revised, as provided in Table 1 below:



Table 1: Original and Revised Targets of Main and Intermediate Indicators

Indicator	Baseline	Unit of Measure	Original Target - Aug. 28, 2017	Revised Target - of Aug. 31, 2018	Comments
Indicator One: Increased sales by the micro, small and medium energy enterprises reached by the project.	0	Percent	15	30	Revised given funds availability, potential for increasing the target.
Indicator two: Indirect project beneficiaries that have improved access to energy as a result of this project.	0	Number	500,000	1,230,000	Revised due to increase in other targets – consequential.
<i>Intermediate Result Indicator 1:</i> ³ Increased sales by female headed micro, small and medium energy enterprises reached by the project. (note 1)	0	Percent	10	20	Revised given the funds availability, potential for increasing the target.
<i>Intermediate Result Indicator 2:</i> Number of Biogas units sold	0	Units	1,050	1,550	As above
<i>Intermediate Result Indicator 3</i> Number of schools with improved cook stoves	0	Number	240	350	As above
<i>Intermediate Result Indicator 4</i> Numbers of PREMS projects successfully delivered	0	Number	5	10	As above
<i>Intermediate Result Indicator 5</i> Numbers of enterprises supported in villages newly connected by ASER's mini- grid program	0	Number	100	274	As above

11. Project Restructuring. On August 21, 2017 the first restructuring of the project took place along with an additional financing of US\$ 1.0 million. The closing date was extended by one year to August 31, 2018. The results framework was changed with increased targets for the indicators. Most of the additional financing (almost US\$ 0.6 m) was allocated to advisory services component, whereas the balance of US\$ 0.4 million was shared equally between “productive uses” and “project management” activities. The closing date was extended to expand the implementation activities for the components 1 and 2, to enhance the sustainability of the project activities and maximization of its impact.

3. This indicator was considered as a main result indicator by E4I apparently due to some miscommunication between the Bank team and E4I.



12. Subsequently, under the second restructuring of August 23, 2018, the project closing date was extended from August 31, 2018 to November 30, 2018 with an additional financing of US\$ 38,000 (to cover the cost of a final project results video to facilitate the dissemination of project achievements).
13. Under the third restructuring of November 30, 2018, the project was granted a final no-cost extension to February 28, 2019 to enable completion of remaining activities. No other change was made in the project.
14. With the extended time for implementation and additional funds, the expected rate of growth of sales for the supported enterprises was targeted to increase from 15 percent in the original proposal to 30 percent, whereas the target for indirect project beneficiaries that improved access to energy would increase from 500,000 to 1,230,000 at the end of the project. The financing commitment was increased by US\$ 1.0 million on August 2017 and by US\$ 38,000 on August 2018. The total disbursements made by the project were US\$ 4,249,661.44, whereas the grant amount was US\$ 4,267,902.
15. Other Changes. During project's implementation following changes took place.
 - The sub-component (d) under component 1 was aimed to support Senegal's National Biogas Program (PNB) to deploy biogas systems for rural households. The activity had to provide business advice and technical assistance related to selected biogas activities (Senegal). E4I proposed to increase the target number of bio-digestors in September 2017 from the original 1,050 to 1,550. Until then the PNB in Senegal was doing well; had imported 1,000 new digesters and had received 3,000 orders for installations to be done between 2017 and 2018. E4I's proposal for one year's extension was based on the premise to reach the original target of 1,050 digesters by December 2017 and install an additional 500 digesters in January to April 2018. The EU decided to withhold funding PNB in October/November 2017 and suspended financing for the program because it considered the consumer-facing subsidy of 80 percent of the biogas units' cost to be exceptionally high. This large subsidy was deemed necessary by the PNB's team to ensure that the sales figures met the target, but with such a high subsidy, the program was viewed as completely unsustainable over the longer term. As a result, the sale of biogas units plummeted, and only half of the targeted number of digesters under the project were built. In fact, even the original target couldn't be achieved.
 - Sub-component (b) under component 2 related to engagement with the Senegalese Rural Electrification Agency (ASER) to provide technical assistance for productive use of energy in newly electrified villages. The ASER project failed to take off due to the failure to secure financing from the Islamic Development Bank. In early 2016 the resources of ESME 1 were diverted to support enterprises in newly electrified villages other than those selected by ASER.
16. Rationale for Changes and their implication on the original theory of change
 - The additional financing and changes in the allocation were needed to enable achievement of increased targets of result indicators. The changes in the result



indicators were needed as there existed adequate potential in the project to achieve higher targets for various indicators with reasonable increase in the project cost and completion period.

- The first two extensions in closing date of the project enabled completion of all the activities considering that the targets for some of the result indicators and intermediate indicators were significantly enhanced to improve project's impact, as indicated in Para 8 above. The last extension was for enabling completion of an activity which was added nearly at the end of the second extension. Under this activity a project video was prepared by E4I, which will remain a useful tool for knowledge dissemination of project's key activities and achievements.
- The changes in the targets of result indicators increased the expected benefits (outputs) from the project by providing additional capacity of medium and small enterprises towards increasing the energy access in the four countries. The increase in financing and extension in closing date facilitated the enhanced level of outputs (increased result indicators) with exception to the activity for increasing the sales of biogas units in Senegal. Apparently, better planning for inclusion of this activity and coordination with the financiers of this activity was needed. E4I and the Bank should have considered at project appraisal that a subsidy of 80 percent on the sale price of biogas units may not be sustainable.

II. OUTCOME

Assessment of Achievement of Each Objective/Outcome

A. RELEVANCE OF PDOs

17. The PDO is to strengthen the capacity of small and medium enterprises to provide access to energy in selected countries of Sub-Saharan Africa. The relevance of PDOs is rated high. The Project contributed to the Bank Group's Country Partnership Strategy (CPS) or County Partnership Framework (CPF) in the four beneficiary countries of SSA, namely Kenya, Tanzania, Uganda and Senegal. There is adequate evidence of the alignment of the project's PDO to the respective strategies of the four countries. The project's contribution to energy access is aligned with Kenya's CPS of FY 2014-2018. Project directly contributed to the CPS between the World Bank and Government of Kenya's first domain of engagement aiming at improving the infrastructure and business environment, while being responsive to environmental pressures. The project's technical assistance to MSME contributed to achieving the CPS target of increasing the number of people provided with electricity (combined for Kenya and Tanzania – around 700,000). Further, the project has contributed to the second domain of engagement which aimed to protect the vulnerable and help them develop their potential by enhancing access to improved healthcare facilities and employment creation in the supported mini-grid companies, energy products manufacturers and retailers as well as in enterprises that are connected to the mini-grids and making productive use of the supplied electricity.

18. The project supported the CPF of FY 2018-2022 of Tanzania for increased access to energy under the Focus Area 1. It further provided for enhanced energy connectivity for improved services to rural areas. The project contributed to increased access to energy as part of enhancing public infrastructure, which is in line with CPF of Uganda for 2016-2021.



The Project contributed to increased sales by medium and small enterprises and increased access to a wide range of indirect project beneficiaries. Overall, the project increased the thrust towards energy access in these three East African countries. The project’s development objectives remained consistent with the CPS or CPF for these four countries.

19. In Senegal improved access to affordable electricity was provided as an outcome under Pillar 1 of the CPS of FY2013-2017, together with improved investment climate for power sector and improved agricultural productivity and marketing and improved rural access to electricity. In summary, the four countries were benefited from the project without any direct involvement of their governments in project’s implementation.

20. The relevance of the project after restructuring remained unchanged, as there were no changes in the objectives or policies of the four governments related to increased assistance to energy access. The changes made in the project were related to scope and no changes occurred on the relevance of the project. The project remains highly relevant to the World Bank’s higher-level energy sector objectives given that Bank has been consistently affirming its increased interest towards the energy access in SSA countries. **Thus, relevance of PDOs for the project is rated as high.**

B. ACHIEVEMENT OF PDOs (Efficacy)

21. Overall efficacy of the project is rated as substantial. The objective of the Project is to strengthen the capacity of small and medium enterprises to provide access to energy in selected countries of Sub-Saharan Africa. The outcome described is a single element, namely increased access of energy, hence assessment of PDO will be done as a single objective.

22. A wide range of activities were undertaken in the four countries to achieve outputs needed for achievement of targets established for result indicators. These are listed in the Table 2 below.

Table 2 – Project Activities

Serial No.	Description of Activity
A	Facilitation for access to finance, door-to-door selling, sensitization, diversification of suppliers, business and technical monitoring to women entrepreneurs in Senegal– this contributed to improved managerial, technical and marketing skills (which helped them become more effective energy entrepreneurs by achieving higher sales and revenues for their business enterprises).
B	Support to schools in reducing market and financial barriers to increase improved cookstoves adoption.
C	Provision of training relating to strategy development, electricity uptake and compatibility etc. to enterprises in villages which were newly connected by mini-grids.
D	Technical support to PNB to deploy bio gas systems. E4I provided business mentoring comprising improvement of business skills in marketing, accounting, bookkeeping and entrepreneurship spirit for the employees.
E	Support to local stoves manufacturers to increase their knowledge of market thus improving their capacity.
F	Technical assistance to energy customers for productive use of energy in newly electrified villages.
G	Business advice and technical support to selected PREMs to develop and implement their projects. These projects were provided business advice, mentoring and technical support to develop and implement their projects. Training included financial education training, business plans consultations, effective use and operations of equipment after installation and support in finding new areas for business for sales enhancement.
H	Facilitation to enterprises for appliance leasing or financing from external financial providers or mini-grid developers
I	Support to promote other PUE activities to users of energy.



23. The implementation of project activities was entrusted to E4I, which through its previous engagement in the predecessor project (ESME-SSA) gained a valuable insight into the energy sector MSMEs of the four countries. Day to day implementation in the four countries was managed by country-based managers and staff with a regional manager based in the regional office in Nairobi, Kenya. The manager for M&E was also based in Nairobi, who would interact with his local team members based in the country offices. The chief executive of E4I based in London retained the overall responsibility of the operations, who was assisted by a finance officer also based in London. The activities undertaken are categorized under the three components. The first component comprised of advisory and capacity building activities for the energy sector MSMEs. Much of the support to MSME's was in the form of initial outreach workshops, followed by one-on-one mentoring and advising; and assistance with financing proposals and linkages. E4I worked closely with the MSME's to develop a business plan and match the entrepreneurs with willing financiers. These included advisory services to early stage MSMEs serving the energy market in Kenya and Tanzania as well as technical assistance to project developers to support and accelerate the development and growth of small, renewable energy projects in Kenya and Tanzania. Besides, support was provided in Senegal for women towards becoming energy entrepreneurs in rural areas. In addition, business advice and technical assistance related to selected biogas activities was provided in Senegal. In Uganda, engagement with cookstove manufacturers, schools and financial institutions was organized to reduce market and financial barriers to increase adoption of improved cookstoves for schools. Under the second component, productive use activities were provided in newly electrified villages in Kenya and Tanzania. Engagement with ASER helped in providing of technical assistance for productive use of energy in newly electrified villages in Senegal. In addition, business and technical support was provided to multisector energy SMEs, named as PREMS to help them develop and implement their projects. Under the third component "project management", E4I provided coordination, monitoring & evaluation (M&E), financial management, procurement, general administration and logistics. Table 3 below provides a summary of targets achieved at the PDO and intermediate indicators.



Table 3: Summary of Achieved Results

Indicator	Baseline	Target	Target Achieved	Percentage Achieved	Remarks
PDO Indicator One: Increased sales by the micro, small and medium energy enterprises reached by the project.	0	30%	29 ⁴ %	97	Target achieved.
PDO Indicator two: Indirect project beneficiaries that have improved access to energy as a result of this project.	0	1,230,000	1,209,947	98	Target achieved
<i>Intermediate Result Indicator 1:</i> ⁵ Increased sales by female headed micro, small and medium energy enterprises reached by the project. (note 1)	0	20%	48%	240	Target achieved and exceeded
<i>Intermediate Result Indicator 2:</i> Number of Biogas units sold	0	1,550	717	46	Target not achieved
<i>Intermediate Result Indicator 3</i> Number of schools with improved cook stoves	0	350	398	114	Target achieved
<i>Intermediate Result Indicator 4</i> Numbers of PREMS projects successfully delivered	0	10	15	150	Target achieved and exceeded
<i>Intermediate Result Indicator 5</i> Numbers of enterprises supported in villages newly connected by ASER's mini- grid program	0	274	274	100	Target achieved

24. The project adequately met the target for the first PDO indicator namely achieving increased sales⁶ by micro, small and medium enterprises of their products for increased access to energy in selected countries in SSA. Overall, the enterprises supported by the project increased sales by an average of 29 percent at the end compared to the baseline. This achievement is more than targeted 15 percent increase in sales for the period of up to August 2017 and is 97 percent of the revised target for the period of up to project closing on end February 2019 (which was 30 percent). Besides, a total of 1,209,947 individuals are project indirect beneficiaries⁷ i.e. they have benefited from access to improved energy services compared to the target of 500,000 by August 2017 and 1,230,000 by project closing.

⁴ Total sales increased from around US\$ 19.106 million to US\$ 24.742 million.

⁵ This indicator was considered as a main result indicator by E4I apparently due to some miscommunication between the Bank team and E4I.

⁶ Growth in sales over the review period is calculated as the percentage increase in sales volume by comparing the current sales against the baseline.

⁷ The number of project beneficiaries is calculated as the number of products sold (solar home systems, solar lantern, a mini-grid connection, cookstove etc.) multiplied by the number of estimated users per unit, or the beneficiary factor. The number of users per unit is the average number of members of a household who will use the product and was established from official demographic information. Assumptions - 5 persons per household in East African countries, 9 persons per household in Senegal; For schools the number of users is the actual number of students, teachers, staff etc. who are benefitting from the use of product.



25. All but one of the project’s original targets—together with the revised enhanced targets for intermediate result indicators—were achieved by the project. In the context of “increased sales by female headed MSME enterprises reached by the project”, women entrepreneurs in Senegal recorded a high growth (almost 100 percent growth) in sales after the start of project implementation. Even if the baseline is set as an average of the first 3 months of sales, the growth percentage was 48 percent, much higher compared to the target of 20 percent. Regarding the improved cooking stoves in Uganda, end target for sales increased significantly (almost 14 percent) through the project’s supported advisory and capacity building measures. Project exceeded the revised increased target for “numbers of PREM projects successfully delivered” by 50 percent. Besides, the project accomplished the target for “number of enterprises supported in Senegal”. The objective of this component was initially to stimulate and promote productive use of electricity in 90 villages where ASER would install 56 mini-grids. Since the mini-grids were not constructed, the project was changed from focusing on mini-grid villages to those which were being electrified through the national grid extension. A total of 43 enterprises were supported in those villages that were recently connected to the national grid at that time.

26. The only intermediate indicator which couldn’t be fully achieved, was the end target for “number of biogas units sold”. The under-achievement for the sales of biogas units is attributed to the decision of European Union (EU) during project implementation (2017) to suspend financing of the program. This resulted in removal of financing subsidy, which was rather huge at that time (80 percent). The major deficiency came from the failure to continue the subsidy program by PNB and the measures should therefore focus on dealing with government agencies such as PNB. One of the key measures should be to work closely with the government agencies. In that case E4I could have facilitated constitution of a project steering committee or an advisory group in which the project issues would be regularly discussed to identify challenges and develop solutions. Moreover, it would have been useful for EU to engage a project advisor or a consultant to implement the market development aspects of the project such as training, mentoring, demand activation, end users financing, monitoring and reporting. Two measures were taken to develop different approaches that weren’t dependent on PNB up to 80 percent subsidy. The measures were: i) to develop commercial market for compost from bio-digestors which would generate additional income revenues to the bio-digester owners and increase their ability to afford non-subsidized bio-digestors plants, ii) to develop partnership with organizations that would facilitate outreach to farmers/potential bio-digester clients and facilitate financing to enable them to pay for the bio-digestors. Such organizations included APROVAG, Association of Banana Producers of the Gambia River Valley, which presented an opportunity to sell at least 100 bio-digestors. The un-utilized resources allocated for this sub-component were re-allocated to other activities under the project. Based on above, the overall efficacy of the project is rated as “Substantial”.

27. The achievement of the PDO indicators are shown in the Table 4 below. The first indicator for the PDO objective, namely “increased sales by MSME enterprises” achieved (the end target. Similarly, the other indicator “indirect project beneficiaries that had improved access to energy” for the PDO objective almost achieved the end target. **Overall, the PDO objective was successfully achieved thus efficacy for this objective is rated Substantial.**

Table 4: Achievement of Main Indicators

Target	Unit	Baseline	End Target	Actual	Achieved (%)
Increased sales by MSME enterprises reached by the project	Percentage (%)	0	30	29	97 ⁸
Indirect project beneficiaries that have improved access to energy (number)	Numbers	0	1,230,000	1,209,947	98%

⁸ Total sales increased from around US\$ 19.106 million to US\$ 24.742 million.



C. Efficiency

28. Efficiency for the project is rated as Substantial. As the project is a technical assistance project, no economic and financial analysis of the project was included at appraisal. Project resources and inputs were converted adequately towards achieving project results. The costs involved in the project even after including the additional financing, are considered reasonable - if some weightage is given to the diverse set of activities that were undertaken for achieving project results in the four countries. The project completion period agreed under the financing agreement was found challenging and had to be extended by a year initially and thereafter by another six months in two steps. This is considered reasonable given the diverse array of services completed under the project and involvement of four countries.

29. The Table 5 below summarizes estimated figures for unit sales, beneficiaries, baseline sales, total sales by MSMEs and annual savings by beneficiaries, as provided by E4I.

Table – 5: Detailed Beneficiaries, Sales and Savings Information

Products Sold – Units, Services Beneficiary Country	Units Sold	Beneficiaries Numbers	Baseline Sales US\$	Total Sales US\$	Savings by Beneficiaries US\$	Remarks
Improved Cookstoves – Domestic (Dom.) Kenya, Tanzania	72,350	361,750	2,387,789	2,507,178	5,209,200	Savings of 1 household (HH) US\$6/month (mo.). Cost-1 Stove-US\$34.65
Improved Cookstoves – Dom. Senegal	1,821	16,389	-	36,420	131,112	Same as above
Improved cookstoves (Institutions) Uganda	398	278,600	-	387,332	477,600	Savings for a school with an improved cookstove - US\$100/mo.
Solar Lanterns – Kenya, Tanzania	257,750	257,750	7,835,027	8,931,931	18,558,000	Savings of 1 ⁹ HH - US\$ 6 / mo. 1 Lantern cost- US\$ 35.0
Solar Lanterns – Senegal	7,316	7,316	-	292,640	526,752	Same as above
Solar Home Systems Kenya, Tanzania	50,000	250,000	6,750,000	7,425,743	3,720,000	Savings of 1 HH - US\$6.2 / mo. Cost of SHS - US\$ 150
Solar Home Systems, Senegal	1,821	16,389	-	364,200	135,482	Same as above

⁹ In this instance, the US\$6/household is based upon a figure of US\$6 per month spent on kerosene to achieve the same level of lighting as delivered by the PV lamp. This is a well-established surrogate measure, and is in fact, quite conservative compared to the equivalent measure that strictly calibrates the lumen output from PV lanterns to the cost of the precise lumen output from kerosene lamps.



Products Sold – Units, Services Beneficiary Country	Units Sold	Beneficiaries Numbers	Baseline Sales US\$	Total Sales US\$	Savings by Beneficiaries US\$	Remarks
Mini-grids (Solar, Hydro) - Connections Kenya, Tanzania	1,500	7,500	-	100,446	-	No annual savings
Mini-grids (Solar, Hydro) - Consumption Kenya, Tanzania	1,125 (MWh)	-	-	450,000	-	No annual savings
PUE Enterprises On Mini-grids and On-grids Kenya, Tanzania	-	-	2,131,501	2,664,376	210,432	PUE enterprises save 25 percent of their business expenditures – which is a profit to business
Briquettes Uganda	360 tons	1,800	1,626	1,951	2,160	Limited savings
Biogas Senegal	717	6,453	-	1,434,000	51,624	Savings here include only energy component. Thus, limited savings
PREMS (standalone SHS for productive uses) Senegal	NA	6,000	-	145,860	11,520	PUE enterprises save 25 percent of their business expenditures – which is profit to business
Total		1,209,947	19,105,943	24,742,077	29,033,882	

30. *Benefits to Beneficiaries.* The savings of around US\$ 29.0 million to around 1.2 million beneficiaries due to the project until August 2018 is considered significant. However, there may be factors other than the project that contributed to increase in the savings to the beneficiaries. These factors could be governmental policies, tax incentives and others. Computation of these factors would need a deeper study, therefore a conservative figure of 10 percent of annual savings is attributed to this project – that is US\$ 2.9 million in one year (on a conservative side). Annual savings of US\$ 2.9 million to the beneficiaries from a project investment of US\$ 4.3 million indicates a return of over 60 percent (it is assumed here that beneficiaries were not making any investment to the project from their own resources).

31. *Benefits to MSMEs.* The project resulted in a 29 percent increase in sales of the energy enterprises (MSMEs) in the four countries (Estimated sales of MSMEs- US\$ 24.7 million; Baseline sales-US\$ 19.1 million). As this increase of 29 percent took place for 2.5 years (say 3 years), the percentage annual increase of sales is 9.7 percent. It is assumed that 5.0 percent of increase in sales may have happened without this project, such as governmental policies. As such, sales increase of 4.7 percent per year is attributed to the project. Sales are likely to sustain over the years given the lack of availability of grid supplied electricity until other interventions in the market take place.

32. Achievement of above stated results within a period of less than three years through an investment of around US\$ 4.3 million spread over four countries is considered cost efficient as the benefits have been passed to both end beneficiaries and MSME enterprises.



33. One key reason for achievement of these results, which are highly satisfactory, is the experience already gained by E4I in executing the ESME-SSA project. Besides, the experience gained by the Bank team in that project was equally valuable in a fast track operation in all the areas of implementation. E4I's understanding of the Bank's processes—both pre-existing and acquired by training under the project—with respect to procurement, financial management, and disbursements further enhanced the efficiency of project implementation. From a comparative viewpoint, operations in Senegal, a West African country was quite challenging given the increased logistics and working in a far different environment compared to the three East African countries.

34. The budget allocation for the project management undertaken by E4I was increased from US\$ 395,155 to US\$ 590,963. This was needed due to increase in target indicators, implementation period, increased travel costs for the management team and the M&E staff and final video preparation. The number of trips from Nairobi to Kampala, Dar es Salaam, Mwanza and Dakar increased in response to the need to support the project teams on site with setting performance objectives, monitoring and reporting. The M&E team was strengthened by more qualified staff to improve the data collection, analysis and reporting.

35. The project has strengthened capacities of many small and medium energy enterprises to provide access to energy in Kenya, Tanzania, Uganda and Senegal in different business areas. Given the high potential for increasing energy access in these countries, these MSMEs are expected to consolidate and enhance their activities in one or more business areas. At the same time, the local populations that benefited (indirectly) from the project—estimated at more than 1.2 million beneficiaries—is still a fraction of the population of close to 170 million in these countries. For impact on a larger segment of population, there is a compelling case for replication of similar projects with necessary adjustments in the structure and components considering the unique conditions in the respective economies. This project, as implemented in multiple countries, may not be replicable by itself. Rather, this approach highlights the benefits to these types of activities which can be included in future energy access projects. Adding a US\$3-4 million, energy access outreach, cooking and productive use component to future access projects would not increase the cost much, and if well-designed, it will reduce the payback time to the utility and/or mini-grid operator and make local electricity customers better off as a kind of “win-win” activity. Furthermore, the institutional experience gained by E4I itself is noteworthy: the organization has been actively promoting the energy access efforts in several countries across SSA, with the support of development partners. As for regulatory and policy frameworks, mini-grid regulations are the biggest policy bottleneck across Africa—if the mini-grid regulations are not right, they will not be built and access to remote parts of the country will be delayed further. Obviously, there is no need for subsidization as productive users are better advised to live within the tariff and other policy constraints. Micro-financing serves as a great boon to such MSME investments, if credible MFI's operations are targeted in rural areas.

D. Overall Outcome Rating

36. The overall outcome of the project is rated Satisfactory, based on high relevance of the PDO, substantial efficacy of project objectives, and substantial efficiency.

E. Other Outcomes and Impacts

37. **Gender.** The project has positive gender impacts. Sales of SMEs headed by women executives increased by 48 percent due to project's support. This is indicative of the active involvement of women in the SMEs at higher management levels. Women are benefited from the project given that the combined indirect project beneficiaries exceeded by a million



in the four countries. The achievement in other areas have a significant impact on women. For example, increase in number of schools with improved cookstoves has positive impact on women (including girls) as the impact extends to female students, teachers and the parents.

38. **Institutional Strengthening.** The introduction of mini-grids creates opportunities for women to set up and expand their small-scale business, farming and similar other opportunities. The platform of E4I in the four countries facilitated the stakeholders including MSMEs to network with each other and find ways to seek help from others. The stakeholders included manufacturers, businessmen, engineers, consultants, financiers, developing agencies and governmental bodies. This helped development work for energy access. Even with the project completion, the capacity created will remain available in promoting the cause of energy access.

39. **Private Sector Impact.** The project provides a road map to MSMEs as well as large segment of population to work together as suppliers, contractors and users of available technology towards increased access of energy. This helps the small-scale private sector to take a role across the entire landscape of these countries in delivery of energy to the far-flung population. Introduction of private sector, even in a small way, provides encouragement for improved delivery and higher efficiency in providing improved access of energy.

40. **Poverty Reduction.** The business model enabled the project to reach rural under-privileged populations to enable them to benefit from energy access. It reduces the burden on the Government to provide electricity development facilities in areas with lower population density or those which are located far from the national grid. Job opportunities become available to the direct or indirect beneficiaries and to those who participate in the project as suppliers, experts and actual users of appliances. The productive uses of electricity in the communities enhance the income generation of population with lower resources. In summary, the project contributes to poverty reduction by facilitating increased energy access to the population and using productive uses from the available electricity.



III. KEY FACTORS THAT AFFECTED IMPLEMENTATION AND OUTCOME

A. Key Factors during Preparation

41. E4I provided a workable structure bringing staff from the recipient countries together with a limited number of international experts to build a cohesive and supportive working atmosphere. Being a follow-on project, the E4I as the implementing agency already had accumulated a sound experience on MSMEs and the energy sectors of the four countries from its predecessor project (ESME-SSA).

42. Bank provided necessary support to facilitate prompt engagement of consultants for the project. In this context the Bank team agreed to increase the thresholds of post review for the selection of Consulting Services for QCBS, LCS and CQS estimated cost less than the equivalent of US\$200,000 to US\$300,000 per contract; and from US\$ 50,000 to US\$ 100,000 for IC. The turnaround times for the Bank's response and approval for procurement and financial management activities were both improved compared to response and approval times during the predecessor project (ESME-SSA).

B. Key Factors during Implementation

43. E4I provided a workable structure bringing staff from the recipient countries together with a limited number of international experts to build a cohesive and supportive working atmosphere.

44. To expedite the hiring, the Bank team agreed to increase the thresholds of post review for the selection of Consulting Services for QCBS, LCS and CQS estimated cost less than the equivalent of US\$200,000 to US\$300,000 per contract; and from US\$ 50,000 to US\$ 100,000 for IC. The turnaround times for the Bank's response and approval for procurement and financial management activities were both improved compared to response and approval times during ESME I.

45. E4I team possessed experience in procurement related to World Bank policies and procedures, however, additional training for the new staff was considered necessary because of relatively high turnover rates. The Bank team arranged training for relevant E4I staff to address this issue. E4I staff were provided training on implementation including financial management, procurement and disbursement, leading to a familiarity and relative ease of operations during implementation.

46. The program in Senegal faced challenges, especially in the sub-component intended to support Senegal's National Biogas Program (PNB) to deploy biogas systems for rural households. The main reason was the shift in policies of EU in 2017—the main funding agency of the PNB—who decided to suspend financing for the program because the user-facing subsidy of 80 percent was determined to be unsustainable. Therefore, fewer biodigesters were constructed compared to the original target, but funds were re-allocated to other activities in Senegal.

47. The productive use activities of newly electrified villages in Senegal included engagement with the Senegalese Rural Electrification Agency (ASER) to provide technical assistance for this activity. Unfortunately, the ASER project never kicked off due to delays in securing financing and procurement within both the financier (IDB) and ASER. As such, in first quarter of 2016, the focus of ESME2 had to be shifted to support enterprises in newly electrified villages rather than the villages selected by ASER.



Overall, the results were not impacted under this activity due to close coordination between ASER and E4I.

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

A. Quality of Monitoring and Evaluation (M&E)

48. Monitoring and Evaluation (M&E) design was adequately planned. The indicators selected covered the project objectives and outputs and were aligned with achieving the PDO. However, the project paper didn't include a theory of change or results chain, which would have been more helpful to monitor progress toward the PDOs and assess the project outcome. The result indicators and the intermediate indicators were revised upward during the restructuring due to increased potential of various activities. M&E process as designed by E4I was aimed to deliver following objectives: a) to maintain an up-to-date record of the project's progress, particularly in relation to its performance on the key result indicators, and b) to generate analysis, evaluation and review materials, based on qualitative and quantitative data, to add to the understanding of the program and its operating context.

49. Building on the successes and lessons of the previous project, the project's M&E arrangements were updated to reflect the requirements of this project. The results chain for the activities were well understood by the E4I project team, and data quality assurance methods were of high quality. A major area of weakness identified during the early part of the project pertained to the lack of consistency in indicator wording, and definitions, across several project documents, reflecting the need for the project to reconcile its internal documentation to match the master log-frame, to avoid misinterpretations or miscalculations of progress data. Another shortcoming encountered was the lack of an M&E Coordinator for the project. This deficiency was acknowledged by E4I, and a competent person was selected and hired for this position.

50. M&E implementation activities became more effective upon hiring of a full-time manager for M&E based in the E4I head office in Nairobi. The M&E manager remained responsible for day-to-day activities for managing and populating the results framework, ensuring compliance with reporting cycles and data quality standards, producing relevant reports and analysis, maintenance of the M&E database comprising historical records and performance data for all enterprise clients of E4I. The manager was supported by country-based project managers (Senegal PM, Uganda PM, Head of Advisory Services), who took ownership of results and progress within their areas of responsibility, ensuring their teams comply with the data reporting cycles and quality standards agreed with the M&E manager. Finally, the local field/operational staff and field mentors remained responsible for collecting data from client enterprises and feeding to M&E manager. Where necessary, independent verifiers were used to check on questionable numbers. The transition from paper-based monitoring to computerized monitoring was accomplished in a smooth manner. Monthly reports were sent from the field to the home office based in UK by the program director based in Nairobi.

51. The Bank's supervision was adequate and effective implementation support was made available to E4I and the beneficiary countries. Presence of E4I's team in its regional office (Nairobi) together with Regional Manager and Manager of M&E greatly facilitated the Bank's supervision – moreover it obviated the need for separate country missions for each country, in some cases. . A key reason was that the project, which was relatively a small-scale project, was spread over four countries. Much of the



coordination was maintained during the implementation period with E4I to assist in assessment of project progress with relation to ongoing activities, targets for result indicators and key issues. No difficulties towards coordination with E4I were found during project implementation.

52. **M&E utilization.** The design and implementation data and reports were regularly reviewed by E4I team in Nairobi and other offices. Changes from paper-based data to computerized data management facilitated the reporting by E4I internally and externally, to the Bank. M&E team strived for accuracy and timeliness of information even though 100 percent accuracy, when working with informal and start-up businesses in rural Africa, may be challenging. Local supervisors and senior managers undertook checks in the field to validate reported M&E data, and computer-based checks to check for anomalous patterns in reported data to ensure that, notwithstanding a challenging operating environment, E4I staff maintained professional and ethical standards in data reporting.

53. **Justification of Overall Rating of Quality of M&E.** Overall rating of quality of M&E is high. Adequate emphasis was given to M&E design and implementation. Both E4I and the Bank were able to efficiently utilize the information on project status to monitor progress and undertake adjustments.

B. Environmental, Social and Fiduciary Compliance

54. Given that the project was rated as environmental category C, no Bank Safeguard policy was triggered. However, there was scope for enhancing the environmental and social capacities of E4I and MSMEs on environmental and social safeguards and thus advance the sustainable development benefits of the project. It was envisaged that increased capacity will be integral in the development of any environmental and social plans that may be necessary as part of the activities of MSMEs that may have adverse environmental and social impacts. No specific activities were planned or undertaken under the umbrella of this project.

C. Bank Performance

55. **Quality at entry was Satisfactory.** The project components were established considering the results of predecessor project and interaction with E4I. Issues relating to absence of a baseline for one of the Indicator (e.g. Increased sales by female headed micro, small and medium energy enterprises reached by the project) was addressed in early part of project's implementation.

56. **Quality of supervision was adequate and facilitated by main project office of E4I in Nairobi.** This helped in dealing implementation issues rather proactively. Given the relatively short implementation period of the project, hands on support by the task team on Bank's process (financial management, procurement) helped in smooth flow of funds. By October 2016 almost 27 percent of the approved amount was already disbursed (this was also possible as the retroactive financing was allowed from September 2015). Project's restructuring and additional financing were done in a timely manner to scale up the targets for result indicators and extending the closing date of the project. However, regular missions to the four countries of the project couldn't be taken, which may have helped in dealing with a few issues for improving project's results.



57. **Justification for Overall Rating of Bank Performance.** Overall Bank performance was Satisfactory. Despite the difficulties faced in implementing one of the subcomponents in Senegal, the Bank's efforts positively contributed towards project's success. The biogas investment in Senegal was mainly impacted by policies of EU rather than E4I or the Bank, thus there wasn't much that could have been done by the Bank. Although a project of small scale, it was spread over four countries with multiple activities. Involvement of MSMEs towards supporting energy access is a unique and challenging business model and contrasts with large projects and TA's where large energy sector companies are beneficiaries and provide design and implementation support.

D. Risk to Development Outcome

58. Energy access is recognized as the key challenge for the SSA region and the four recipient countries attach high importance to efforts towards meeting this challenge. The business model with the involvement of MSMEs together with a central role for E4I has definite merits. As the model doesn't directly encroach upon the territories of energy companies and other players, it is likely to succeed if effectively replicated, particularly in these countries. The sales of MSMEs may either continue as before or increase, ignoring extraneous effects. There is no reason to expect that a policy environment less conducive to MSMEs, and thus private sector development, would be adopted in any country. However, as we have seen in Tanzania, the policy environment for mini-grids has indeed become less conducive due to policy shifts. As far as replacement of equipment at the end of its life is concerned, this is a difficult question to be answered - although if it has provided economic benefits, it would be assumed that replacement will take place.

59. The project has duly contributed to increase in capacity of medium and small enterprises towards providing access to energy in the four SSA countries. The momentum developed by the project and the role played by E4I could be replicated in other similar projects with support of the governments, IFIs and bilateral donors. The funding constraints to such initiatives offer challenges and risk to the project's outcome and sustainability of the business model. Besides, funding requirements for such initiatives are rather not exorbitant and projects of smaller scale in one or more countries may be developed. The role and involvement of the Government in such projects may be kept limited to avoid burden on the machinery of the governments. It is also worth noting that E4I is resourceful in the areas of community education and outreach for electrification, partly through the support of this project. They have won contracts with key donors already through deploying these skills.

V. LESSONS LEARNED AND RECOMMENDATIONS

60. The implementation of biodigesters as an activity has provided more insight into the large potential that exists with their usage. Biodigesters can be used for multiple benefits, and energy may not be the most attractive output. The use of the dried slurry from biogas is an important manure substitute and soil conditioner that is very much in demand in many countries around the world. While the energy outputs alone may not provide enough incentive to drive the sales and uptake of this technology as a pure-energy play, if its role in producing fertilizer and operating as a waste disposal processing technology can be better quantified and marketed, the multi-product nature of the product would likely be more effective in stimulating market demand. In each market segment, one end-use may dominate the other



in terms of marketability. Working to promote multiple aspects of the entire value chain should make the biogas producers financially more attractive, thereby reducing the need for a high subsidy. In Senegal, the unsustainability of this high subsidy is what led the EU to withdraw from supporting the technology. In retrospect, the development of a value-proposition covering both energy and other end-uses of the technology will be required to allow users to optimize the technology for their own purposes. The first lesson is that the product should have been less subsidized and promoted not just for their energy benefits, but probably more for their agricultural benefits, with energy as a secondary benefit. Katy Kennedy Freeman's project in Mexico has been successfully deploying biogas in medium-sized agricultural enterprises in Mexico. The second lesson is to organize more coordinated efforts with country agencies given that this is a somewhat unique implementing arrangement where an NGO (E4I) is the recipient of the grant and may not be part of the sector dialogue in the respective country.

61. Under the project, almost 400 schools in Uganda were able to procure and install IICS. However, the improved cookstoves study under the ESME project indicated that out of the total schools interviewed (almost 2,300), a much larger number of schools had installed IICS during the period of engagement. Indeed, the linkage provided by the ESME project worked well as many of the schools directly reached out to the manufacturers. The E4I's engagement with the Government of Uganda, its ministries (energy, education) and manufacturers contributed to the increased usage of IICS by the schools. For sustainable IICS markets and development of long-term strategies, the manufacturers were encouraged to participate in stakeholders and industry associations. Such initiatives merit continuous support from the broader development communities as it provides a 'low-cost', 'win-win' opportunity.

62. The project's design of including four countries spread across the African continent proved challenging. The project's implementation in Kenya, Tanzania and Uganda was relatively smooth given the similarity in these countries' structures, languages, governance, economic state and E4I's significant presence in Nairobi. In Senegal, successful implementation was challenging given the distance from the three Eastern African countries; the lack of cultural similarities witnessed by different languages, different cultures, and different governance systems; and differing financial opportunities (i.e., in Senegal, buyer's credits were required whereas in Eastern Africa, PAYGO solutions deployed through MFIs were a standard financing approach). In future, it would be better to avoid such mismatches in a regional project.

63. Support to productive uses of electricity arguably has positive impacts on economic development. The economic benefits of the project in grid-connected settings is recognized. In the context of mini-grids, the additional value of productive users is that they can serve as anchor clients that are crucial to the commercial viability of the operation. Larger mini-grid operations generally require relatively larger consumption per consumer and by the volume of consumers to break even. Hence, mini-grid developers must focus on stimulating demand within their service areas by stimulating productive uses of electricity. Studies on productive uses conducted by E4I were targeted to find out the best approach to develop larger demand in each mini-grid site based on natural resources and opportunistic economic activities around the site location. They encountered many cases where a single productive user's consumption dwarfed the consumption of the remainder of the customers. Failure to focus on growing the electricity demand of both businesses and households in areas served by mini-grids will make the mini-grid initiatives economically non-viable and leave rural consumers in a low-level equilibrium trap.



64. Even sites which are connected to the national grid must focus on increasing the productive use of electricity by their customers (both household and commercial), as that is where electricity can really lead to development and rising incomes. For example, the Government of Tanzania is now promoting the provision of grid electricity to the entire country. While important to their future development, this goal lies beyond its short-term capabilities. However, if the utility TANESCO—in working with the Rural Energy Agency (REA)—can reach the entire country with the network, TANESCO will only lose more money if the only consumers in rural areas are residential and consume within the lifeline tariff. The rural feeder lines will remain financial liabilities to the utility unless rural consumers begin to use larger quantities of power in households, businesses and industry. The three East African countries all have a life-line tariff structure where the first 50 kWh's are at a subsidized price. It is thus a key for both grid and mini-grid operators for consumers to be using more than that minimum, so that the operators can begin recovering their costs sooner. E4I's approach has been useful for both the utilities and consumers—by getting consumers to use electricity productively to raise their income, which leads to scaleup of the utility's revenues. Hence, in this context, electrification can provide a “win-win” situation for both.

65. E4I prepared a project video which covers various aspects of the implementation. The Bank and E4I may consider sharing the video and other aspects of the project within the access community in the Bank and possibly with the stakeholders involved in moving the access agenda in SSA. The most important dissemination is through informing Bank staff working on access projects that focusing on consumer education, MSME start-ups, capacity building and PUE are key components that belong to almost every access project—beyond just the traditional focus on establishing distribution infrastructure. This approach will be cost effective and should justify the support given to such a component in possibly every access project measured in terms of economic growth and return to utility or mini-grid operator.



ANNEX 1. RESULTS FRAMEWORK AND KEY OUTPUTS

A. RESULTS INDICATORS

A.1 PDO Indicators

Objective/Outcome: Strengthen the capacity of small and medium enterprises to provide access to energy in selected countries in Sub-Saharan Africa.

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Increased sales by the micro, small and medium energy enterprises reached by the project	Percentage	0.00 01-Sep-2015	15.00 28-Aug-2017	30.00 31-Aug-2018	29.00 28-Feb-2019

Comments (achievements against targets):

Revised given the availability of funds, potential for increasing the target and closing date extension.

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Indirect project beneficiaries that have improved access to energy (number) as a result of this project.	Number	0.00 01-Sep-2015	500000.00 28-Aug-2017	1230000.00 31-Aug-2018	1209947.00 28-Feb-2019



Comments (achievements against targets):

Revised due to increase in targets for first indicator and intermediate indicators. (the increase of this target is consequential).

A.2 Intermediate Results Indicators

Component: Advisory services and capacity building support for energy sector micro, small and medium enterprises

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Increased sales by female headed micro, small and medium energy enterprises reached by the project.	Percentage	0.00 01-Sep-2015	10.00 28-Aug-2017	20.00 31-Aug-2018	48.00 28-Feb-2019

Comments (achievements against targets):

Revised given the availability of funds, potential for increasing the target and closing date extension.

Component: Developing productive use activities for newly electrified villages

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Number of enterprises	Number	0.00	100.00	274.00	274.00



supported villages newly connected by minigrids		01-Sep-2015	28-Aug-2017	31-Aug-2018	28-Feb-2019
Comments (achievements against targets): Revised given the availability of funds, potential for increasing the target and closing date extension.					

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Increased sales by female headed micro, small and medium energy enterprises reached by the project.	Percentage	0.00 01-Sep-2015	10.00 28-Aug-2017	20.00 31-Aug-2018	48.00 28-Feb-2019
Comments (achievements against targets): Revised given the availability of funds, potential for increasing the target and closing date extension.					

Component: Project management

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Number of schools with improved cookstoves	Number	0.00 01-Sep-2015	240.00 28-Aug-2017	350.00 31-Aug-2018	398.00 31-Aug-2018



Comments (achievements against targets):

Revised given the availability of funds, potential for increasing the target and closing date extension.

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Number of biogas units sold	Number	0.00	1050.00	1550.00	717.00
		01-Sep-2015	28-Aug-2017	31-Aug-2018	28-Feb-2019

Comments (achievements against targets):

Revised given the availability of funds, potential for increasing the target and closing date extension.

Unlinked Indicators

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Number of PREMS Projects successfully delivered	Number	0.00	5.00	10.00	15.00
		01-Sep-2015	28-Aug-2017	31-Aug-2018	28-Feb-2019

Comments (achievements against targets):

Revised given the availability of funds, potential for increasing the target and closing date extension.





B. ORGANIZATION OF THE ASSESSMENT OF THE PDO

Objective/Outcome 1 Strengthen the capacity of small and medium enterprises	
Outcome Indicators	<ol style="list-style-type: none"> 1.Increased sales by the micro, small and medium energy enterprises reached by the project. 2. Indirect project beneficiaries that have improved access to energy (number).
Intermediate Results Indicators	<ol style="list-style-type: none"> 1.Increased sales by female headed micro, small and medium energy enterprises reached by the project. 2.Number of biogas units sold. 3.Number of schools with improved cookstoves. 4. Number of PREMs projects successfully delivered. 5. Number of enterprises supported in villages newly connected by ASER’s mini-grid program.
Key Outputs by Component (linked to the achievement of the Objective/Outcome 1)	<p>Component 1 – Advisory Services and Capacity Building Support</p> <ol style="list-style-type: none"> a. Capacities of MSMEs and women entrepreneurs strengthened b. PNB deployed biogas systems in rural areas in Senegal c. Local stove manufacturers reduced market & financial barriers together with improved capacity in Uganda <p>Component 2. Supporting Productive Use of Energy</p> <ol style="list-style-type: none"> a. Newly electrified villages received technical assistance for PUE b. Selected PREMS developed & implemented projects c. Appliance leasing & financing from external financial providers and mini-grid developers was facilitated



	d. Other PUE activities promoted Component 3. Project Management - Project procurement, financial management etc.
Objective/Outcome 2 Increased energy usage in newly electrified areas	
Outcome Indicators	Indirect project beneficiaries that have improved access to energy (number) as a result of this project
Intermediate Results Indicators	1.Number of PREMS projects successfully delivered 2.Number of enterprises supported in Senegal villages newly connected by ASER’s mini-grid program
Key Outputs by Component (linked to the achievement of the Objective/Outcome 2)	1.Productive use activities of newly electrified villages developed



ANNEX 2. PROJECT COST BY COMPONENT

Sub-component	Original Budget as of 28 Aug 2017 (US\$)	Revised Budget as of 31 Aug 2018 (US\$)	Revised Budget as of 30 Nov 2018 (US\$)
Component 1: Advisory Services and Capacity Building Support for Energy Sector Micro, Small and Medium Enterprises	2,000,308	2,619,627	2,619,627
Component 2: Productive use support activities for SMEs in newly electrified villages	834,438	1,019,312	1,019,312
Component 3: Program Management	395,155	590,963	628,963
	3,229,901	4,229,902	4,267,902

Project Benefits Key Performance Indicators

	Indicators name	unit of measure	Original Target as of 28 Aug 2017	Revised Target as of 31 Aug 2018	Achieved Results	Achieved of the revised targets
Indicator 1	Increased sales by the micro, small and medium energy enterprises reached by the project	%	15	30	29	97
Indicator 2	Increased sales by female headed micro, small and medium energy enterprises reached by the project	%	10	20	48	100
Indicator 3	Indirect project beneficiaries that have improved access to energy (number) as a result of this project	number	500,000	1,230,000	1,209,947	98.4%
Indicator 1	Number of biogas units sold	Biogas units	1,050	1,550	717	46.3%
Indicator 2	Number of schools with improved cookstoves	Schools	240	350	398	114%
Indicator 3	No of PREMS projects successfully delivered	number	5	10	15	150%



	Indicators name	unit of measure	Original Target as of 28 Aug 2017	Revised Target as of 31 Aug 2018	Achieved Results	Achieved of the revised targets
Indicator 4	Number of enterprises supported in villages newly connected by mini-grids.	number	100	274	274	100%

Budget and Expenses during Implementation.

Stage of Project Cycle	Staff Time and Cost	
	No. of staff weeks	US\$ Thousands
Supervision and ICR		
FY16	1.10	4.49
FY17	12.24	114.99
FY18	2.06	42.05
FY19	28.35	206.09
Total:	43.75	367.62

Note. Staff cost figures include travel and consultant costs.



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

BORROWER'S IMPLEMENTATION COMPLETION REPORT

Assessment of project objective and design at entry

Original Objectives

The Program's Development Objective (PDO) is to strengthen the capacity of small and medium enterprises to provide access to energy in selected countries in Sub-Saharan Africa.

The program has two immediate objectives:

- a) To provide advisory services and capacity building support to MSME enterprises
- b) To developing productive use activities of newly electrified villages

Revised Objectives

The project objectives remained the same as listed under section 1.1

Original Project Components

The project has three components, namely:

- a) Component 1: Advisory services and capacity building support for energy sector micro, small and medium enterprises (MSMEs)

This component specifically focused on:

- i. Advisory services to early stage MSMEs serving the energy market (Kenya, Tanzania).
- ii. Technical assistance to project developers to support and accelerate the development and growth of small, renewable energy projects (Kenya, Tanzania).
- iii. Support for women to become energy entrepreneurs in rural areas (Senegal).
- iv. Support to Senegal's National Biogas Program (PNB) to deploy biogas systems for rural households by providing business advice and technical assistance related to selected biogas activities (Senegal); and
- v. Engagement with cookstove manufacturers, schools, and financial institutions to reduce market and financial barriers to increase adoption of improved cookstoves for schools (Uganda).

- b) Component 2: Developing productive use activities of newly electrified villages

This component comprises the following activities:

- i. Productive use activities in newly electrified villages (Kenya, Tanzania).
- ii. Engagement with the Senegalese Rural Electrification Agency (ASER) to provide technical assistance for productive use of energy in newly electrified villages (Senegal).
- iii. Assistance to selected Projets Energetiques Multi-Sectoriels (PREMS – multisector, energy SMEs) requiring business and technical support to develop and implement their projects (Senegal).



c) Component 3: Project Management

This component was about coordination of the project in the selected countries as well as monitoring and evaluation (M&E), financial management, procurement, environmental and social management, and general administration and logistics.

Project Changes

There were two minor changes in the components design, implementation schedule and budget as presented below.

Changes in components design

a) Component 1: Advisory Services and Capacity Building Support for Energy Sector Micro, Small and Medium Enterprises

Sub-component	Changes
Support to Senegal’s National Biogas Programme (PNB) to deploy biogas systems for rural households by providing business advice and technical assistance related to selected biogas activities (Senegal).	The end user financing subsidy of 80 percent was suspended in 2017 after the European Commission, which is the main funder of the PNB, temporarily suspended financing the programme following a review. E4I adjusted the approach to operate independent of the 80 percent subsidy including 1) to develop commercial market for compost from bio-digestors which would generate additional income revenues to the bio-digestor owners and increase their ability to afford non-subsidized bio-digestors plants 2) to develop partnership with organizations that would facilitate outreach to farmers/potential bio-digestor clients and facilitate financing to enable them to pay for the bio-digestors. Such organizations included APROVAG, Association of Banana Producers of the Gambia River Valley, which presented an opportunity to sell at least 100 bio-digestors.

a) Component 2: Developing productive use activities of newly electrified villages

Sub-component	Changes
Engagement with the Senegalese Rural Electrification Agency (ASER) to provide technical assistance for productive use of energy in newly electrified villages.	The ASER project never kicked off due to delays in securing financing and procurement within both the financier the Islamic Development Bank (IDB) and ASER. In Q1 of 2016 the EBD project focus was shifted to support enterprises in newly electrified villages other than those selected by ASER.

Changes in implementation schedule, closing dates and deliverables

The initial Program closing date was August 28, 2017. This date was amended three times as follows:

First amendment: In August 2017, the closing date was extended to August 31, 2018 through the World Bank’s amendment letter of on August 24, 2017. The purpose of the extension was to expand the activities under implementation in both components in order to enhance sustainability of the project activities and maximize its impact.

Consequently, the project target results were revised upwards as summarized in the table below.



	Indicators name	unit of measure	Original Target as of 28 Aug 2017	Revised Target as of 31 Aug 2018
Indicator 1	Increased sales by the micro, small and medium energy enterprises reached by the project	%	15%	30%
Indicator 2	Increased sales by female headed micro, small and medium energy enterprises reached by the project	%	10%	20%
Indicator 3	Indirect project beneficiaries that have improved access to energy (number) as a result of this project	Number of individuals	500,000	1,230,000
Indicator 1	Number of biogas units sold	Biogas plants	1,050	1,550
Indicator 2	Number of schools with improved cookstoves	number of schools	240	350
Indicator 3	No of PREMS projects successfully delivered	Number of PREMS	5	10
Indicator 4	Number of enterprises supported in villages newly connected by mini-grids.	Number of enterprises	100	274

Second amendment: In August 2018, a cost extension was granted by the World Bank with additional US\$38,000 and changing of the end date from 31 August to 30 November 2018 in order to allow for sufficient time to produce project video, an additional activity that was added to the project following World Bank's request.

Third amendment: In November 2018, E4I requested for an additional no-cost extension to complete the video production. The end date was set to 28 February 2019 and approved by the World Bank through its letter of 30 November 2018.

Changes in finance

The initial project budget was US\$3,229,902, see Annex 1, was increased to US\$4,229,902 and further to US\$4,268,000 during the first two amendments (discussed in Section 1.4.2 above) as follows:

First amendment: In August 2017, E4I requested additional US\$1,000,000 to expand EBD program activities across all program components. The project budget was increased from US\$3,229,902 to US\$4,229,902, please see the details below.

Sub-component	Original Budget as of 28 Aug 2017 (US\$)	Revised Budget as of 31 Aug 2018 (US\$)
1. Component 1: Advisory Services and Capacity Building Support for Energy Sector Micro, Small and Medium Enterprises	2,000,308	2,619,627
2. Component 2: Productive use support activities for SMEs in newly electrified villages	834,438	1,019,312
3. Component 3: Programme Management	395,155	590,963



	3,229,901	4,229,902
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The proportion of the Programme Management increased from 12 percent in the initial budget to 14 percent in the revised budget because of increased travel costs from Nairobi to Kampala, Dar es Salaam, Mwanza and Dakar following the need to support the projects team on site with the additional activities planning, setting performance objectives, monitoring and reporting.

Second amendment: This was made in November 2018 to provide additional funding for production of the project video at a total cost of US\$38,000. The total project budget was increased to US\$4,267,902 as in the table below.

Sub-component	Original Budget as of 28 Aug 2017 (US\$)	Revised Budget as of 31 Aug 2018 (US\$)	Revised Budget as of 30 Nov 2018 (US\$)
1. Component 1: Advisory Services and Capacity Building Support for Energy Sector Micro, Small and Medium Enterprises	2,000,308	2,619,627	2,619,627
2. Component 2: Productive use support activities for SMEs in newly electrified villages	834,438	1,019,312	1,019,312
3. Component 3: Programme Management	395,155	590,963	628,963
	3,229,901	4,229,902	4,267,902

Project Delays

The Programme started on the agreed dates and there was no delay. The initial Programme end date was extended for one year in order to resolve implementation challenges caused by delays in the two Programme sub-components in Senegal, discussed in detail in Section 1.4.1, and achieving maximum results in the other sub-components such as

- Conducting preliminary appraisal of loan applications by schools in Uganda, introducing them to banks and following up processing of disbursements
- Increased demand for Programme support from SMEs clients in Kenya and Tanzania in 2017,
- Mentoring of entrepreneurs that were recruited under the productive use projects in Kenya and Tanzania took longer time in order to enable them to acquire appliances and equipment that they needed for their businesses.

Achievement of objectives

Our overall assessment of the extent to which the operation's major relevant objectives were achieved, efficiently, is Satisfactory. There were minor shortcomings in the operation's achievement of its objectives, in its efficiency, or in its relevance as follows:

Achievement of objectives

The objectives were partially achieved, please see Annex 2 for more details.

The Project Development Objective (PDO): To strengthen the capacity of micro, small and medium enterprises to provide access to energy in selected countries in Sub-Saharan Africa



- Overall, the enterprises supported by EBD have increased sales¹⁰ by an average of 29 percent as of August 2018 compared to the baseline. This achievement is 97 percent of the revised target for the period of up to August 2018 (which was 30 percent).
- In Senegal, women entrepreneurs recorded a +100 percent growth in sales since they only started selling the products after joining EBD and so their baseline was zero.
- The project has benefited 1,209,947 individuals as indirect beneficiaries i.e. through access and use of improved energy services compared to the targeted 1,230,000 individuals.

Objective 1 - Advisory services and capacity building support for MSME enterprises

- A total of 717 biogas plants have been installed by 36 enterprises that were supported by EBD in Senegal, benefiting at least 6,000 people. This achievement is equivalent to 46 percent of the revised target of 1,550 units of August 2018. The underachievement in sales of biogas plants is a result of suspension of subsidy provided to end users, see section 1.4.1, which slowed down the uptake of bio-digesters as many people cannot afford the full price of the bio-digestors.
- A total of 398 schools have installed improved institutional cookstoves (IICS) as a result of EBD in Uganda, benefiting about 200,000 people including school children, teachers and other support staff. This achievement is equivalent to 114 percent of the revised target of 350 schools. The project managed to reduce the schools' problem of lack of financing by promoting credit sales by stove manufacturers, supporting them to develop appropriate stoves designs and packaging them for different types and sizes of schools. Approximately 50 percent of the 398 schools purchased their stoves through credit provided by stove manufacturers with repayment aligned with the school terms, less paper work and no need to place collaterals, unlike the commercial financing institutions. However, most of the stove manufacturers have limited financial capacity to provide credit to many schools as such some schools had to wait longer to benefit from this arrangement. A financing facility for stoves manufacturers would be useful to enable them to have capacity to provide credit to many schools.

Objective 2 - Developing productive use activities of newly electrified villages

- A total of 15 PREMS have been successfully supported to obtain equipment which is 50 percent more than the revised program target of 10 PREMS by 31 August 2018.
- A total of 274 enterprises have been supported which is 100 percent of the revised target of 274 by 31 August 2018. Across the 274 enterprises, 161 business owners acquired 264 appliances.

Relevance

The operation's objectives, design, and implementation are partially consistent with the country's current development priorities and with current country and sectoral assistance strategies and corporate goals.

- EBD support has directly contributed to the Country Partnership Strategy (CPS) FY14-FY18 between the World Bank and Government of Kenya first domain of engagement aiming at improving the infrastructure and business environment, while being responsive to environmental pressures. The program has provided technical assistance to micro, small and medium (MSME) which have in turn contributed to achieving the CPS target of increasing the number of people provided with electricity by 700,000 (this figure is across both Kenya and Tanzania as the advisory clients supported through EBD did not disaggregate their sales data) through access to solar lanterns and SHS. Further, EBD has

¹⁰ Growth in sales over the period of review is calculated as the percentage increase in sales volume by comparing the current sales against the baseline.



contributed to the second domain of engagement which aims to protect the vulnerable and help them develop their potential by enhancing access to improved healthcare facilities and employment creation in the supported mini-grid companies, energy products manufacturers and retailers as well as in enterprises that are connected to the mini-grids and making productive use of the supplied electricity.

- In Tanzania, objective 2 of the Country Assistance Strategy (CAS) FY12-FY15 is to “Build Infrastructure and Deliver Services,” and under this, outcome 2.1 is “Improved access, quality, and sustainability of electricity.” Through the work with MSMEs, EBD has contributed to increasing access to energy by providing access to 700,000 people (this figure is across both Kenya and Tanzania as the advisory clients supported through EBD did not disaggregate their sales data) through access to solar lanterns and SHS. In addition, EBD contributed to achieving CAS outcome 1.3 which focuses on enhanced sustainability and improved management of natural resources, under which promotion of new rural energy solutions are a priority. No new Country Assistance Strategy could be found for comparison.
- For Senegal, EBD relevance was in contributing to achieving the CPS FY13-FY17 Pillar I “Accelerating Growth and Employment” through the provision of non-financial services for MSMEs and enhancing rural access to energy benefiting 40,000 people.
- EBD in Uganda has contributed to reducing depletion of natural resources by increasing schools’ usage of improved cookstoves and alternative fuels such as briquettes. The CAS for 2010-2015 identified the high level of deforestation caused by a demand for charcoal and fuelwood as a key challenge.

Performance of Borrower

Our assessment of the extent to which the Government and the implementing agencies ensured quality of preparation and implementation, and complied with covenants and agreements, toward the achievement of development outcomes, is as follows.

Lessons learned

- Lesson 1: E4I standard approach and methodology in business development support (BDS) services didn’t work well in Senegal and needed significant adjustment. In Senegal unlike in East Africa, there is relatively high levels of rural poverty, low levels of education, low usage of pay-as-you-go end user financing options and women entrepreneurs operates in groups instead of individual which means more work was needed to support very diverse business development and learning needs. E4I adjusted the BDS approach to focus on supporting women groups instead and developed financial mechanisms based on suppliers’ credit at the main source of capital to enable entrepreneurs to acquire stock of products and repay over a longer time. E4I guaranteed some of the entrepreneurs for up to 70 percent of the credit amount.
- Lesson 2: In addition to clean energy supply, the target end users of bio-digestors should be educated on the economic value compost with small gardens farming or selling to other farmers. One biodigester can produce up to 24 tons of compost per year equivalent to US\$2,000 which is a significant amount of money for a last mile household in Senegal. A biogas project should take into account income generating activities related to the biodigester value chain and improved animal rearing where animals stay near the biodigester which will make it easier to fill it with the dung. A financial mechanism can be structured based on the value of the compost to make the whole value chain work.



- Lesson 3: The actual number of schools which have installed IICS could be more than what has been reported. From the improved cookstoves study that was conducted in Uganda in the first half of 2017, out of the total sample of over 2300 schools that were interviewed, 871 had IICS and 286 to 596 of these schools having installed during the period when EBD was operating. Many schools went ahead to procure IICS without reporting to E4I which implies that EBD impact may be more than what has been reported. This result is attributable to EBD because the project team had extensively engaged the schools and for most of them their staff were learning about the stoves for the first time. After engagements with the schools' management there were all indications that they would install stoves after they had known price and were linked to the stoves manufacturers who were participating in the EBD.
- Lesson 4: Most of the IICS manufacturers have been significantly empowered to continue looking for more clients/schools and construct stoves. By August 2018 additional 51 schools installed IICS after the project had ended direct support to entrepreneurs in April 2018, bringing the total to 398 schools. E4I approached focused on sustainable market growth with extensive engagement of Government agencies and Ministries (Energy and Education), IICS entrepreneurs, financial institutions, schools' owners' and teachers associations, stakeholder and industry associations, such as a Uganda National Clean Cooking Association (UNCCA).
- Lesson 5: Mini-grid projects design and strategies have changed over time to include demand stimulation and developing offtaker business. EBD has supported a number of developers to take up the role of PUE themselves and build PUE business cases into the site and resource assessment. This is from E4I lessons learnt on how to develop large demand at each mini-grid site based on natural resources and economic activities found in the area surrounding the site. For instance, in one of the projects in Uganda, the project developer is investing ice block making and water purification businesses which will consume 400kW in total out of available 600kW generation capacity.
- Lesson 6: Promotion of productive uses of electricity is important even in large grid extension and densification projects. Low utilization of electricity is a serious concern to REA and Tanesco in Tanzania in their rural electrification projects. REA requested E4I to support productive uses of electricity in 3 villages that were connected to the national electricity grid. In these villages it was possible to develop and establish large-scale productive activities than what was possible in mini-grid sites where installed generation capacity is limited and tariffs are usually high. The experience and lessons learnt from this project have been utilized in other projects helping REA to stimulate uses of electricity in already connected villages and in planning productive uses support in their future rural electrification projects.
- Lesson 7: Mini-grids provides a solution to rural electrification and enabling productive use activities in rural areas given their superior capacity than stand-alone solar home systems. However unclear rural electrification policies and strategies in some countries have slowed down investments in mini-grids. In Tanzania for instance, the Government wants to connect all the villages and doesn't encourage investments in mini-grids in the mainland. In Rwanda, the government has already developed rural electrification plan which identifies the off-grid areas for mini-grids which is expected to inform the mini-grid developers where they can operate.
- Lesson 8: Success of a PUE project depends on availability of financing to enable acquisition of electrical appliances/equipment and working capital. A large number of mini-grid operators opted to provide financing especially for large equipment such as mills, welding machines and carpentry tools in order to speed up access to financing and increase consumption. In most sites, consumption increased more than double but was varying significantly between months due to factors ranging from availability of appliances, tariff, general economic situation of the village, seasonality (e.g. businesses



are closed during harvesting season), machine breakdown, to personal life situation (e.g. relocation, child birth, funerals etc.), among others. Equipment with longer operating hours, even with small power rating such as barber shops/ hair salons and video shows, tend to consume more electricity than those used for fewer hours. In remote off-grid areas, often formal financial institutions or equipment suppliers are not present and, in that case, mini-grid developers have to close the gap in delivering equipment to end users.

- Lesson 9: Impact of electricity is evident in many newly electrified villages in terms of outputs. Given the short duration of the project, the impact assessment has included measuring increased income, savings and electricity consumption and diversification of products and services in the villages. A proper Impacts assessment should focus on long term, multi-layered results and should include non-quantifiable factors such as customer experiences.
- Lesson 10: A more targeted approach is needed in order to realize the maximum benefit of a technical assistance project on mini-grid. Instead of supporting many enterprises with wide range of needs and at different development stage, it will be useful to select a few that are more likely to succeed and support them to the financial close.
- Lesson 11: Clean energy access is evolving in response to the changing user needs, price, availability, financing options and penetration of the alternatives such as LPG and extension of grid electricity. There is still need to develop new and more efficient products that match the market new demands such as cooling and refrigeration, water pumping, grain milling etc. using solar stand-alone systems and mini-grids. The work that has been done under EBD provides foundation to develop large scale interventions to meet the new energy demands for productive activities.
- Lesson 12: E4I success in this project, providing the 1.2 million people with access to clean energy services during the three years, is a relatively very small proportion of the total population in the project countries, close to 170 million inhabitants. There is still more work to be done, particularly in rural areas where about 70 percent of the population lives which means more support will be required in order to scale up the initiative such as EBD and benefit more people.

Performance of World Bank and other partners

World Bank: Implementation

Our assessment of the extent to which the Bank supported effective implementation through appropriate supervision (including ensuring adequate transition arrangements for regular operation of supported activities after loan/credit closing) is Satisfactory. There were some shortcomings in the proactive identification of opportunities and resolution of threats.

The following shortcomings caused challenges to E4I

- Procurement: there are a number of occasions that the project team requested guidance from the World Bank officials who are specialists in procurement but there were delays in getting responses or no responses at all. The Bank staff could be more available to guide the procurement activities by E4I especially at the early stages of the project.
- Approval of project extensions: the approval of the first request of extension took much longer which resulted into a slowdown in implementation of some activities as it caused uncertainties of employment among staff.
- World Bank refresher training: E4I team was trained by the World Bank on regulations and guidelines for procurement, finance control, disbursement requests and reporting in July 2016. There was no



planned refresher training. It would be useful to conduct such trainings during the course of implementation of a project as a way to ensure understanding of the World Bank's guidelines and regulations.



ANNEX 4. SUPPORTING DOCUMENTS (IF ANY)

1. Project Paper
2. Grant Agreement
3. Integrated Safeguards Data Sheet
4. Project Information Document
5. Restructuring Papers (3)
6. Final Implementation Supervision Report (ISR) archived on April 12, 2019

**ANNEX 5. BANK LENDING AND IMPLEMENTATION SUPPORT/SUPERVISION****Task Team members****During Preparation**

Names	Role	Title	Unit
Siet Meijer	Team leader (ADM Responsible)	Operations Officer	GEE07
Joel Buku Munyori	Procurement Specialist (ADM Responsible)	Senior Procurement Specialist	GG001
Josephine Kabura Kamau	FM Specialist	Senior FM Specialist	GG031
Gulgoren A. Cansiz	Team Member	Consultant	GEE07
Juliana Chinyeaka Victor	Team Member	Senior Monitoring & Evaluation Specialist	GEESO
Maria Luisa Ana Esteban Meer	Team Member	Temporary	GEEDR
Mary C.K. Bitekerezo	Safeguards Specialist	Senior Social Development Specialist	GSU07
Mohammad Nadeem	Legal Analyst		LEGAM
Raymond Peter Von Culin	Safeguards Specialist		GENDR

During Implementation

Names	Role	Title	Unit
Richard H. Hosier	Team Leader	Senior Energy Specialist	GEE08
Joel Buku Munyori	Procurement Specialist	Senior Procurement Specialist	GGOPA
Henry Amena Amuguni	Financial Management Specialist	Senior Financial Management Specialist	GGOAE
Edward Felix Dwumfour	Environment Specialist	Senior Environment Specialist	GENA1
Gibwa A Kajubi	Social Specialist		GSU04
Gulgoren A. Cansiz	Team Member		GSU06
Juliana Chinyeaka Victor	Team Member	Senior Operations Officer	GEE08
Lien Thi Bich Nguyen	Team Member		GTR10
Chita Obinwa	Team Member	Senior Program Assistant	GEE01
Maina Ephantus Githinji	Environment Specialist		GENA1
Mary C. K. Bitekerezo	Social Specialist		GSU07
Mohammad Nadeem	Counsel	Legal Analyst	LEGLE
Sandra M Kuwaza	Team Member		WFACS
Siet Meijer	Team Member	National Resources Management Specialist	GCCFM