

## **First Performance Review and Baseline Report for GET FiT Uganda**

### **Background**

In 2015 the German Financial Cooperation in partnership with the Republic of Uganda procured an independent evaluation and performance review of the Global Energy Transfer Feed-in Tarrif (GET FiT) programme, managed by Kreditanstalt für Wiederaufbau (KfW). The first deliverable under the Terms of Reference was the First Performance Review and Baseline Report which can be found attached.

An advisory group provided oversight and direction to KfW. The role of the advisory group was to review the technical quality of the evaluation and to ensure that the design and implementation were robust and credible and would stand up to external scrutiny. The advisory group comprised of representatives from KfW, the GET FIT Secretariat, the UK Department of Business, Energy and Industrial Strategy (BEIS) and the UK Department for International Development (DFID). Included in this group were evaluation specialists, economists and programme managers.

The advisory group provided feedback to the contracted evaluation team, Castalia, on their deliverables (October 2015 – August 2016), including specifically on the 'Evaluation and Performance Review of the GET FiT Uganda Program, Inception Report' and 'First Performance Review and Baseline Report for GET FiT Uganda'.

Detailed below is a summary of the groups' comments on the First Performance Review and Baseline Report for GET FiT Uganda.

### **Overall**

The advisory group consider that the report identifies some interesting findings and recommendations as well as raising some questions and generic lessons to consider in the future implementation of GET FiT. However, the group consider that that the value of the report has been limited by its design, the application of methods, and the presentation of findings.

- The advisory group consider that the GET FiT Performance Review and Baseline Report has been undertaken in an appropriately independent manner, despite relying heavily on data and information provided by parties directly involved in the implementation and management of GET FiT.
- The group recognise that this is the first report of the proposed three stage evaluation. As such it was not intended to be an evaluation in its own right; however, where evaluation questions were addressed the group felt the report was not of sufficient quality to give confidence in the ability of the consultant to deliver the remaining reports.
- The group consider that the presentation of the final report could have been greatly improved and made more accessible and user-friendly, by use of a leaner, more

concise structure and a clearer linkage from the evaluation questions, methods and approach to the findings, conclusions and recommendations.

### **Methodological concerns**

- Demonstration of the methodological approach outlined in the inception report is severely lacking. Methodological approaches are discussed at a theoretical level but there is no more detail than the inception report, which meant the group was unable to judge the strength of the contribution claims. The report also fails to explain how these methods support the overall evaluation approach (theory-driven that applies realist principles).
- The group found that the report centres on a discussion of the data (surveys, interviews, literature review, and logical framework) rather than data interpretation through the robust methods suggested in the inception report.
- The group felt that the report did not provide sufficient detail to provide an adequate baseline for future reports, in particular lacking information on how it deals with the baseline data requirements and the baseline time frame, against which to compare later progress.
- An explanation of data collection and cleansing approaches is missing. The group felt that the report should state how it has managed data protection, access to information, and beneficiary feedback, and how it will be managed in future evaluations.

**Overall, the advisory group concluded that the report did not meet the minimum quality standards as outlined in the terms of reference and are publishing the attached report for transparency reasons.**



# **First Performance Review and Baseline Report for GET FiT Uganda**

**Report to Government of Uganda  
represented by KfW**

**May 2016**

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The Global Energy Transfer Feed-in Tariff Program (GET FiT) is designed to increase private investment in renewable energy (RE) generation projects in Uganda. It does this by topping-up Uganda's existing Renewable Energy Feed-in Tariff (REFiT) with an additional premium, providing standardized legal documents, mitigating investor risk through guarantees, providing capacity building for the electricity regulator, and supporting the construction of interconnection infrastructure.<sup>1</sup>

GET FiT has run four competitive tenders to select privately financed, small-scale RE projects for support. The first tender was in 2013, the last in 2015. Thirty-nine projects applied for support in these tenders. From these, 17 were selected for support. One of these 17 projects has been commissioned so far. The remaining 16 are in various stages of development.

This Performance Review and Baseline Report is the first of three reports that Castalia will prepare, in evaluating GET FiT over a 5-year period. The next report will be in 2017 and cover the program's performance and impacts through to the end of 2017. The evaluation will be completed in 2019 with the Third Performance Review and End-Term Evaluation Report.

This first report provides initial answers to the performance review, and to evaluation questions that can be answered at this early stage. The most important of these concerns whether GET FiT is contributing to private investment in renewable energy in Uganda, and what the experience so far suggests for the design of similar programs in the other countries.

**To what extent has GET FiT addressed the barriers to private sector investment in RE projects in Uganda? What proportion of the change in investment in RE occurred as a result of GET FiT?**

Our analysis shows that GET FiT is effectively addressing barriers to private investment in RE projects in Uganda. One new project is already operational, and 16 more are being developed. However, only one project has reached commercial operation, therefore, the impact of GET FiT on carbon emissions, electricity access, and electricity consumption will be assessed in the next two reports.

At this point in the evaluation we are, however, able to say that it is likely that the projects supported by GET FiT would not have gone ahead if GET FiT did not exist. Therefore, whatever impact those plants eventually have in increasing investment, improving electricity supply, job creation, and reduction in greenhouse gas emissions, can fairly be attributed to GET FiT.

Looking at each of the GET FiT interventions individually, we conclude as follows:

**The premium payment (a top-up to the REFiT) offered by GET FiT was likely necessary for all power plants supported by the program.** The Theory of Change hypothesizes that the premium was needed to top-up financial returns to the point that lenders would lend, and developers would be motivated to develop projects. All lenders who gave an opinion on the premium payment said it was required for projects to meet their financial covenants. These lenders are financing 10 of the 17 projects in the program. Developers of 15

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<sup>1</sup> These interventions are described in more detail in Section 5.2.

out of the 17 projects said they needed the premium payment. This supports the view that the premium payments were necessary.

An alternative hypothesis is that the projects would have been able to attract financing without the premium payment. Two plants that applied for GET FiT support, but were rejected, were nonetheless able to get financing (one plant was rejected for encroaching on protected land, and the other received an aggregate bid score that was too low, although it achieved the minimum scores required for the individual scoring categories). While this appears to support the alternative hypothesis, the developers of these plants told us they benefitted from unusually good sites. Two other plants with more typical sites were rejected and have not been able to get financing as of yet. The evidence from plants that were rejected then supports the view that typical projects are not able to attract financing without the GET FiT premium.

**The standardized PPAs (Power Purchase Agreements) and IAs (Implementation Agreements) offered by GET FiT were required for most projects supported by the program.** The standardized documents were important for lenders, because they reduced the cost of legal due diligence. Four out of five lenders indicated that, without these standardized documents, they would not have lent to GET FiT projects. These are lenders that financed 12 out of 17 projects in the program. Without finance from lenders, the projects could not go ahead. Only one lender said it could have lent without the standardized documents. This lender was lending to a developer who already had a PPA for an existing project in Uganda.

The standardized documents were also important for developers not already operating in Uganda. The standardized documents reduced barriers to entering a new market by lowering legal fees. Five out of seven developers who did not have an active PPA said the standardized documents reduced costs or time in project preparation.

Developers who already had active PPAs in Uganda—that is to say, developers who were already selling power—did not require the standardized documents. Having negotiated a PPA successfully before, they were confident in doing so again. Even so, some of these developers said the standardized documents reduced their costs.

**The capacity building for the electricity regulator (ERA) on project due diligence likely improved the speed and quality of generation licensing.** ERA staff reported that the capacity building was very effective. Staff said that this helped accelerate the pace of issuing licenses. ERA has issued 15 licenses from the start of 2015 through the end of April 2016 (of which six were for GET FiT projects). From 2012 to 2014, ERA only issued six licenses (of which four were for GET FiT projects). GET FiT aims to bring 17 power plants online by 2020, which would more than double the number of power plants on the grid before GET FiT—this should significantly increase ERA’s licensing burden. An alternative hypothesis—that ERA’s processing speed may not have increased if accounting for all applications, both successful and not—will be examined in the next report in this assignment. It is too early to evaluate the other capacity building provided by GET FiT, on tariff modelling and interconnection.

**The Partial Risk Guarantees (PRGs) offered by the World Bank were not used.** PRGs were offered to back-up letters of credit from commercial banks (covering offtaker payment risk), or to commercial lenders (covering debt default risk). The Theory of Change hypothesized that PRGs would make investors more likely to invest by reducing the risk of default by the Uganda Electricity Transmission Company Limited (UETCL). This is because the PRGs would offer payment from the World Bank in the event of non-payment by UETCL.

Alternative hypotheses supported by the evidence are:

- Development Finance Institutions (DFIs) were willing to take offtaker risk on their lending. These DFIs do not require PRGs, and are in any case not eligible for them. Twelve projects were debt-financed by DFIs without PRGs.
- Some developers are relatively unconcerned by offtaker credit risk in Uganda, and are willing to borrow money on their corporate balance sheet without any protection from off-taker credit risk. Two projects were developed in this way.
- Other risk-mitigation products available are considered to offer better overall value for the money than the World Bank PRG. Two projects have arranged debt finance from a lender who plans to use a different instrument to mitigate credit-risk.

Of the 17 projects in GET FiT, only four had loans from commercial banks. Only two of the four had project-specific financing (the other two loans were made on the strength of developers' whole finances, not just the GET FiT-supported projects)<sup>2</sup>. The two project financing loans were potentially able to benefit from PRGs. The commercial lender providing project financing said that PRGs were too cumbersome, and that other risk coverage was preferable.

**GET FiT's support for interconnection was necessary to allow the program's intended impacts to be realized in the future.** An independent engineering review of the technical study on interconnection indicates that the interconnection support was required. Without this support the grid would eventually not have been able to evacuate all power produced by GET FiT-supported power plants. Ten projects in the GET FiT portfolio required interconnection works which were either funded by GET FiT or funded by other donors coordinated by GET FiT.

**GET FiT's model was innovative.** Unlike many other programs trying to support investment in RE, GET FiT addressed *all* the major barriers to investment. The various interventions worked as a coordinated whole to facilitate projects. This provides a useful model for other countries.

**It is too early to say if GET FiT will have a transformational impact.** There are some positive signs. Developers are trying to use the standardized PPA from GET FiT to develop projects outside the program. The capacity building for ERA seems likely to make investment more attractive by reducing the time to issue licenses—provided the effects of the capacity building can be sustained.

On the other hand, there is a good chance that Uganda will have a surplus of generation capacity for some time to come, and so not need additional power plants. If this happens, GET FiT would not be able to effect transformational change in Uganda.

#### **What suggestions emerge for consideration in design of similar program in future?**

Since this is the first review report in a 5-year evaluation program, lessons and recommendations must be tentative at this point, and are, therefore, phrased as suggestions. Two suggestions for consideration in design of future programs emerge from the analysis.

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<sup>2</sup> No shareholder lending was found. Of the four projects with commercial loans, two had project finance loans (loans directly for the power plant project), and the other two had corporate finance (loans based on the strength of the whole company, not just the GET FiT-supported project). The PRG can only be used to support project financing from a commercial bank.

**Clearly communicate environmental and social (E&S) standards at the start of a tender.** GET FiT used IFC Performance Standards to assess the likely environmental and social impact of projects. These standards are open to a range of interpretations. GET FiT applied the performance standards in ways that differed from some other DFIs. However, GET FiT did not provide clear guidance on how it would apply the standards. This lack of guidance caused difficulties for some project developers.

Future programs should consider providing more precise guidance on what is needed to demonstrate compliance before developers start preparing their applications.

**Integrate selection of power plants for subsidy with selection of power plants for supply of energy to the grid.** UETCL is the single-buyer of power for Uganda's grid. It is widely considered to be good practice for single buyers to use competitive tenders to procure both renewable and conventional electricity generation. These tenders usually select plants based on which offer the lowest cost of energy. GET FiT supported competitive tenders for power plants to supply the grid. However, the cost of energy offered by the plants was not the determining factor in the tender. Moreover, the tenders were run by the regulator and resulted in award of a license, as opposed to being run by the single-buyer and resulting in award of a PPA.

Future programs may consider working with a single-buyer of power (assuming there is one) to build its capacity to run competitive tenders to procure least cost generation. Regulatory licensing would need to be integrated into the process, but need not drive it.

The Introduction to this report shows where all 22 questions from the Terms of Reference are addressed in the report. This report also presents (in Appendix K) the results of a field survey. The field survey is intended to provide baseline information on some areas near GET FiT power plants. This information will be used in the 2017 and 2019 reports to study how GET FiT projects affect the localities they are in. The survey is not used to answer evaluation questions in this report.

## Glossary of Acronyms

<b>ATI</b>	African Trade Insurance
<b>BaU</b>	Business as Usual
<b>BMU</b>	Federal Ministry for the Environment, Nature Conservation, and Nuclear Safety (Germany)
<b>BMZ</b>	Federal Ministry for Economic Cooperation and Development (Germany)
<b>CAPEX</b>	Capital Expenditure
<b>COD</b>	Commercial Operation Date
<b>CP</b>	Condition Precedent
<b>DECC</b>	Department of Energy and Climate Change (UK)
<b>DFA</b>	Developer Finance Agreement
<b>DFI</b>	Development Finance Institution
<b>DFI</b>	Development Finance Institution
<b>DFID</b>	Department for International Development (UK)
<b>DISCO</b>	Distribution Company
<b>DWRM</b>	Department of Water Resource Management
<b>DSCR</b>	Debt service coverage ratio
<b>E&amp;S</b>	Environmental and Social
<b>ERA</b>	Electricity Regulatory Authority (Uganda)
<b>EUR</b>	Euros
<b>GET FiT</b>	Global Energy Transfer Feed-in Tariff
<b>GFPPM</b>	GET FiT Premium Payment Mechanism
<b>GHG</b>	Greenhouse Gas
<b>GoU</b>	Government of Uganda
<b>HV</b>	High Voltage
<b>IA</b>	Implementation Agreement
<b>IC</b>	Investment Committee
<b>ICF KPI 15</b>	International Climate Fund's Key Performance Indicator 15
<b>IFC</b>	International Finance Corporation
<b>IFC PS</b>	International Finance Corporation Performance Standards
<b>IRR</b>	Internal rate of return
<b>JITF</b>	Joint Interconnection Task Force
<b>LV</b>	Low Voltage
<b>M&amp;E</b>	Monitoring and Evaluation
<b>MEMD</b>	Ministry and Mineral Development (Uganda)
<b>MoFPED</b>	Ministry of Finance, Planning, and Economic Development (Uganda)
<b>MV</b>	Medium Voltage
<b>NEMA</b>	National Environmental Management Agency
<b>O&amp;M</b>	Operations and Maintenance
<b>OECD DAC</b>	Organization for Economic Cooperation and Development—Development Assistance Committee

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<b>PPA</b>	Power Purchase Agreement
<b>PRG</b>	Partial Risk Guarantee
<b>PRQ</b>	Performance Review Question
<b>RE</b>	Renewable Energy
<b>REA</b>	Rural Electrification Agency
<b>REFiT</b>	Renewable Energy Feed-in Tariff
<b>RfP</b>	Request for Proposal
<b>SC</b>	Steering Committee
<b>SREP</b>	Scaling Up Renewable Energy Program
<b>TA</b>	Technical Assistance
<b>ToR</b>	Terms of Reference
<b>TRANSCO</b>	Transmission Company
<b>UEGCL</b>	Uganda Electricity Generation Company Limited
<b>UETCL</b>	Uganda Electricity Transmission Company Limited
<b>UECCC</b>	Uganda Energy Credit Capitalization Corporation
<b>UK</b>	United Kingdom
<b>URA</b>	Uganda Revenue Authority
<b>VAT</b>	Value-Added Tax
<b>VoLL</b>	Value of Lost Load
<b>WB</b>	World Bank
<b>WENRECO</b>	West Nile Rural Electrification Company

# 1 Introduction

This Performance Review and Baseline Report presents Castalia’s analysis of the performance to date of the GET FiT program (Global Energy Transfer Feed-In Tariff program). This report also presents data collected to inform analysis in the next two reports in this engagement. These will be the 2017 Second Performance Review and Mid-Term Evaluation, and the 2019 Third Performance Review and End-Term Evaluation. Castalia was engaged to evaluate the performance of GET FiT by the Government of Uganda, represented by KfW.

GET FiT is a donor-funded program that aims to increase private investment in renewable energy (RE) power plants in Uganda. An overview of GET FiT’s structure and goals is presented in Section 2. Section 3 summarizes the Theory of Change and logframe for GET FiT. These set out how GET FiT is expected to achieve its development results, and how progress can be tracked.

The analysis in this report is organized around the Organization for Economic Cooperation and Development—Development Assistance Committee (OECD DAC) evaluation criteria.<sup>3</sup> (The questions asked in the Terms of Reference for the evaluation have been organized under the DAC criteria.

- **Effectiveness** measures the extent to which an aid activity attains its objectives. Basic performance data on GET FiT are presented in Section 4. In Section 5, observed results are attributed to the GET FiT program.
- **Relevance** is the extent to which the aid activity is suited to the priorities and policies of the target group, recipient and donor. Section 6 discusses whether GET FiT was a good fit for Uganda’s priorities.
- **Efficiency** measures the results—qualitative and quantitative—in relation to the inputs. It is an economic term which signifies that the aid uses the least costly resources possible in order to achieve the desired results. Section 7 shows our assessment of how resources were converted in to outputs and outcomes.
- **Impacts** are the positive and negative changes produced by a development intervention, directly or indirectly, intended or unintended. GET FiT’s impacts will be analyzed in more depth in the next two reports in this assignment. Some preliminary findings are shown in Appendix E.1.
- **Sustainability** is concerned with measuring whether the benefits of an activity are likely to continue after donor funding has been withdrawn. GET FiT’s sustainability will be analyzed in more depth in the next two reports in this assignment. Some preliminary findings are shown in Appendix E.3.

Other important issues were addressed that do not fit with the DAC criteria:

- **Transformational impact** means changing the investment environment for RE in Uganda such that investment occurs that did not have direct support from GET FiT, and also would not have occurred without GET FiT. GET FiT’s transformational

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<sup>3</sup> <http://www.oecd.org/dac/evaluation/daccriteriaforevaluatingdevelopmentassistance.htm>

impact will be analyzed in more depth in the next two reports in this assignment. Some preliminary findings are shown in Appendix E.3.

- **Learning** means measuring progress and adjusting plans accordingly in the short term; and learning what worked well to inform other interventions over the long term. Section 8 assesses how well GET FiT has incorporated opportunities for monitoring, evaluation and learning into its design and operations, and what lessons can be learned.

**Table E.1: Guide to Questions**

Number	Question	Section
EQ1a	To what extent has GET FiT addressed the barriers to private sector investment in RE projects in Uganda?	5.2
EQ1b	What proportion of the change in investment in RE occurred as a result of GET FiT?	5.3
EQ1c	What is GET FiT's Impact?	E.1
EQ3	What evidence is there that GET FiT has had transformational impact?	E.2
EQ4	How likely is GET FiT to be sustainable?	E.3
EQ5	Was GET FiT Relevant for Uganda?	6
PRQ1	To what extent have the output targets and milestones been met?	4.1
PRQ1a	What was the level of attribution of change to each of the donors of the program?	5.3.1
PRQ1b	To what extent have the outcome and impact targets and milestones been met?	4.1
PRQ2, 2a, 2b, and 4	How have challenges and opportunities impacted on the delivery of GET FiT's outputs? How did GET FiT respond to challenges and opportunities?	4.2
PRQ3	What other programs are being implemented that could have led to the same outputs?	6.2
PRQ4	This was combined with PRQ2, 2a and 2b.	4.2
PRQ5	What systems and processes are in place to effectively deliver the intended results and learn lessons?	8.1
PRQ6	Was GET FiT an appropriate model to deliver the intended outcomes?	7.1
PRQ6a	Did the GET FiT tendering arrangements work and what lessons can be learnt from them?	7.2
PRQ6b	Was the choice and arrangements with the implementation consultant appropriate (again lessons for the future)?	7.3
PRQ7	What lessons can be learned from the interaction between the World Bank guarantee insurance and the GET FiT program?	8.2
PRQ7a	What lessons can be learned from the World Bank guarantee issuance and impact on cost of capital and which products required guarantees and which did not, and so forth?	8.2
PRQ7b	Are the World Bank guarantees being issued faster and more frequently in a) GET FiT b) Outside of GET FiT?	8.2

Number	Question	Section
PRQ7c	How many guarantees have been issued to small renewable energy projects outside of GET FiT?	8.2
PRQ7d	Has the World Bank replicated the “no objection” and packaging arrangement anywhere else?	8.2

Supporting material is provided in the appendices, including preliminary findings to be explored in depth in the future reports, and detailed explanations of analytical approaches.

- Appendix A shows detailed logframe results for the program’s outputs
- Appendix B shows detailed logframe results for the program’s outcomes and impacts
- 0 provides data on trends in RE investment in Uganda
- Appendix D provides details on other donor programs in RE in Uganda
- Appendix E provides preliminary answers to some questions, which will be answered in more detail in later reports
- 0 provides an overview of which analytical techniques were used to answer which questions
- Appendix G explains the technical approach to selecting interviewees
- 0 explains the technical approach to synthesis of attribution findings
- Appendix I explains how the performance Review Questions were answered
- 0 explains the technical approach to surveys of consumers of electricity
- Appendix K and Appendix L show the results from surveys of consumers of electricity
- Interview templates for developers, investors, and lender are shown in:
  - Appendix M for those with projects supported by GET FiT
  - Appendix N for those who bid unsuccessfully for GET FiT
  - Appendix O for those who never bid for GET FiT support
- Appendix P shows questionnaires used for survey of consumers of electricity.

## **2 About GET FiT**

The Global Energy Transfer Feed-in Tariff Program (GET FiT) is designed to increase private investment in renewable energy (RE) generation projects in Uganda. It does this by topping-up Uganda's existing Renewable Energy Feed-in Tariff (REFiT), providing standardized legal documents, mitigating investor risk through guarantees, providing capacity building for the electricity regulator, and supporting the construction of interconnection infrastructure.

This section presents:

- General background on the program's aims and design
- The program's institutional arrangements
- The program's design
- The key milestones in developing RE projects
- A timeline of key events in the program.

### **2.1 Overview of GET FiT Uganda's objectives and design**

The objective of the GET FiT Uganda Program is to help Uganda pursue a climate resilient low-carbon development path resulting in growth, poverty reduction, and climate change mitigation.<sup>4</sup> The main feature of the program is a front-loaded, results-based premium payment designed to top-up Uganda's Renewable Energy Feed-in Tariff (REFiT). The GET FiT program has four other components. All the components are presented in Table 2.1.

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<sup>4</sup> <http://www.getfit-uganda.org/about-get-fit/>

Table 2.1: GET FiT Components

	Program Components	Mechanism
1	<b>GET FiT Premium</b>	A top-up payment provided to projects as a premium on top of the REFiT tariff. Half of the total GET FiT Premium is paid when power plants come online (Commercial Operation Date), and the other half is paid out over the first 5 years of the power plants' operating lives.
2	<b>Support to standardization of PPA, and other legal documents</b>	A law firm was contracted to support Electricity Regulatory Authority (ERA), the Government of Uganda, and Uganda Electricity Transmission Company Limited (UETCL) in creating a standardized set of legal agreements agreeable to key stakeholders. These documents included bankable Power Purchase Agreements, Implementation Agreements, and Developer Financing Agreements for small independent power producers.
3	<b>World Bank International Development Agreement (IDA) Partial Risk Guarantee Facility</b>	The World Bank has committed US\$160 million to offer Partial Risk Guarantees (PRGs) providing these services: <ul style="list-style-type: none"> <li>▪ Supporting UETCL's Power Purchase Agreement obligations by facilitating the provision of short-term liquidity support to UETCL</li> <li>▪ Offering termination compensation to developers in the event of government or utility default</li> <li>▪ Guaranteeing commercial debt.</li> </ul>
4	<b>GET FiT Capacity Building</b>	The GET FiT capacity building component supports ERA in improving its skills and processes for tariff modelling, due diligence for power plant licensing, and oversight of wheeling and interconnection.
5	<b>Interconnection Component</b>	GET FiT is providing additional funds to build new interconnection infrastructure, and refurbish existing infrastructure. This will help ensure that power produced by GET FiT-supported power plants can flow across the national power grid and reach distant centers of demand.

Source: GET FiT Annual Report 2014, interviews with Kathrin Kaestle from KfW and GET FiT Secretariat.

GET FiT Uganda was jointly developed by the Government of Uganda (GoU), the Electricity Regulatory Agency (ERA) and KfW. GET FiT Uganda is supported by the Government of Norway, the Government of the United Kingdom, the Government of Germany, and the European Union through the European Union Africa Infrastructure Fund. The World Bank provided support by offering a Partial Risk Guarantee (PRG).

The total donor commitment to the GET FiT Uganda program is EUR94 million,<sup>5</sup> from the European Union, Germany, Norway, and the United Kingdom (UK). GET FiT is now trying to raise more money to be able to meet its original targets<sup>6</sup>. The commitments by donors to date are shown in Table 2.2.

<sup>5</sup> This is the commitment at current exchange rates according to KfW, as of mid-November 2015

<sup>6</sup> As discussed in Section 4.2,

**Table 2.2: Donor Funding Commitments in Euros (without interconnection support)**

Donor	Euros	Percent of total
<i>DECC</i>	<i>28,900,000</i>	<i>31%</i>
<i>DFID</i>	<i>14,100,000</i>	<i>15%</i>
<b>United Kingdom</b>	<b>43,000,000</b>	<b>46%</b>
<b>European Union</b>	<b>20,000,000</b>	<b>21%</b>
<b>Norway</b>	<b>15,900,000</b>	<b>17%</b>
<i>BMZ</i>	<i>15,000,000</i>	<i>16%</i>
<i>BMU</i>	<i>500,000</i>	<i>1%</i>
<b>Germany</b>	<b>15,500,000</b>	<b>16%</b>
<b>TOTAL</b>	<b>94,400,000</b>	<b>100%</b>

Note: Figures may not add up due to rounding

Source: GET FiT Annual Report 2015

GET FiT Uganda currently plans to support a portfolio of 17 small-scale renewable energy (RE) generation projects promoted by private developers. One project is on a reserve list—this project will receive support from GET FiT if the program finds adequate funding. The projects have an expected total installed capacity of roughly 155MW and are expected to yield approximately 730GWh of electricity production per year once all are operating.<sup>7</sup> GET FiT Uganda was officially launched on 31 May 2013.

## 2.2 GET FiT Uganda institutional arrangements

The GET FiT Program was established by an Agency Agreement between GoU and KfW<sup>8</sup>. The program is implemented by KfW on behalf of GoU. GET FiT's steering committee, which consists of donors and GoU agencies, sets policies, and authorizes changes to operational guidelines. GET FiT's investment committee makes tendering decisions for small-scale<sup>9</sup> renewable energy (RE) power plants on behalf of GoU.<sup>10</sup>

The Investment Committee appraises projects bidding for support from GET FiT (based on appraisal reports written by consultants), to decide which will be eligible for the premium. The committee is composed of seven renewable energy experts, and a representative of KfW. KfW has veto power.

<sup>7</sup> As of mid-November 2015, according to data received from GET FiT

<sup>8</sup> The evaluators reviewed a letter signed by KfW and the Ugandan Ministry of Finance, Planning and Economic Development which summarized aspects of the agency agreement. The actual agency agreement was not provided for reasons of confidentiality.

<sup>9</sup> In GET FiT, small-scale is defined as installed capacity of 20MW or less

<sup>10</sup> Interviews with Kathrin Kaestle from KfW and GET FiT Secretariat.

The GET FiT Secretariat coordinates and supervises the Program. The GET FiT Secretariat is staffed by the Implementation Consultant. The Secretariat's role includes:<sup>11</sup>

- Facilitating meetings for relevant stakeholders
- Ensuring smooth and timely running of the RfPs and subsequent appraisals, and Investment Committee (IC) meetings
- Maintaining a dialogue with developers
- Acting as tender agent to procure consultants to provide services for GET FiT, with KfW administering the tender
- Following up on action points from GoU, KfW, the Steering Committee (SC) and IC.

The implementation consultant (Multiconsult<sup>12</sup>) manages the day-to-day business of the Secretariat, performs the independent appraisals during the RfP process, and manages the supervision of individual projects.

KfW is the lead implementing institution. KfW administered the tender to select the implementation consultant and other consultants. KfW also helps manages, on behalf of the GoU, consulting contracts, and contracts that provide subsidy payments through GET FiT.

GET FiT is managed by a Project Manager at KfW's office in Uganda. The KfW head office in Frankfurt, Germany provides support including procurement services for the program<sup>13</sup>, management and disbursement of payments, and supervision by a head of division. KfW is also primarily responsible for GET FiT's institutional memory. Records of all project documentation are stored in a central server in Frankfurt, in keeping with KfW rules. Contracts are kept in hard copy in a vault in Frankfurt.<sup>14</sup>

These and other institutions involved in governing and implementing GET FiT are shown in Table 2.3. Box 2.1 provides a brief overview of the structure of the Ugandan electricity sector.

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<sup>11</sup> Annual Report 2013

<sup>12</sup> Multiconsult was formerly known as Norplan.

<sup>13</sup> That is, procuring goods and services to help implement the program. KfW's procurement department did not run the tenders that chose the power plants receiving support from GET FiT.

<sup>14</sup> Kathrin Kaestle from KfW

Table 2.3: Institutional Arrangements

Entity	Role in GET FiT	Steering Committee	
		Member	Observer
European Union	Donor	✓	
Government of Norway	Donor	✓	
Government of United Kingdom (DFID, DECC)	Donor	✓	
Government of Germany (Ministry of the Environment, Ministry of Economic Cooperation and Development)	Donor	✓	
Ministry of Finance, Uganda	Signatory to GET FiT's financing agreements, and recipient of funds for GoU	✓	
Ministry of Energy and Mineral Development, Uganda	Oversight	✓	
World Bank (International Development Association)	Offers Partial Risk Guarantee (PRG) Facility		✓
ERA (Energy Regulatory Authority), Uganda	ERA is the implementing agency within the GoU		✓
KfW	KfW is the lead institution for implementation, filling the role of: program administrator. This includes administering funds on behalf of GoU, signing contracts, running tenders on behalf of GoU, monitoring and supervision of the program, coordination, making implementation decisions in consultation with GoU, and communicating officially with developers.		
GET FiT Steering Committee	Determines all policy-related principles of GET FiT, including changes to operational guidelines		
GET FiT Secretariat	Assists KfW in the day-to-day management, coordination, and		

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Entity	Role in GET FiT	Steering Committee	
		Member	Observer
	supervision of program implementation. Communicate with developers, reporting and communication.		
<b>Implementation consultant (Multiconsult)</b>	Manages day-to-day business of the GET FiT Secretariat, supervises individual projects, performs independent appraisals during the RFP process, provides regular reporting which is quality assured by KfW		
<b>Investment Committee</b>	Seven international energy and investment experts and KfW, in charge of appraisal and investment decisions for projects applying for GET FiT support		
<b>Uganda Electricity Transmission Company Limited (UETCL)</b>	Single buyer of power from GET FiT-supported generation facilities, and transmission of power at high voltage		
<b>National Environment Management Authority (NEMA)</b>	Ensuring environmental compliance and granting permits		
<b>Rural Electrification Agency (REA)</b>	Arrange for construction of lines required to evacuate power from GET FiT-supported facilities at sub-transmission voltages.		
<b>Uganda Revenue Authority (URA)</b>	Approve tax incentives for RE investment		

Source: GET FiT Annual Report 2013 and 2014, Semi-Annual Report 2015, ToR.

### Box 2.1: Electricity Sector Overview

This box presents an overview of key facts about the electricity sector in Uganda.

- UETCL is the single buyer of electricity. It on-sells wholesale electricity to distribution companies (principally Umeme, the concessionaire serving most customers), and also operates the national transmission grid.
- Most installed generation capacity is privately owned (56 percent). Uganda Electricity Generation Company Limited (UEGCL), a government-owned company, owns the remaining 44 percent of generation. The generation owned by UEGCL is operated under long-term contracts with private operators.
- The REFiT program was established in 2007 by ERA. REFiT establishes a schedule of tariffs for power produced from small RE plants with various technologies (20MW or less).
- ERA issues generation licenses to power plant developers.
- Much of the distribution is done by Umeme, a private concessionaire. A number of smaller companies operate distribution companies in small towns and rural areas. With the exception of WENRECO in the West Nile region, these all take power from UETCL's national grid. The smaller companies are supported financially and managerially by REA (Rural Electrification Agency).

Source: Interview with UETCL staff, Interview with UEGCL staff, "Power Planning Committee Briefing Paper: Uganda's Electricity Demand and Supply Situation in Medium-Term", Uganda REFiT Tariff Guidelines

## 2.3 GET FiT's Design

GET FiT aims to increase returns and reduce risk for private investment in small-scale<sup>15</sup> RE power plants, through the following interventions:

- **Premium payment:** The premium is a "top-up" to REFiT that aims to make RE projects financially viable by increasing the revenue paid to investors. The top-up is split in two parts: an upfront payment at a project's commercial operations date (COD), and a series of payments for power produced over 5 years.
- **Standardized PPA and other legal documents:** The standardized documents are in line with international standards for bankable contracts. This should reduce legal risk and transaction costs. Besides a Power Purchase Agreement (PPA), an Implementation Agreement (IA) and Developer Finance Agreement (DFA), and the associated Direct Agreements were prepared (see Section 2.4).
- **Capacity building for ERA:** The capacity building helps ERA improve its regulation of RE, and of interconnection to the grid. This should reduce regulatory risk.
- **Partial Risk Guarantees (PRGs):** PRGs offer compensation to investors in the event of nonpayment under the PPA. This should reduce offtaker risk.

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<sup>15</sup> For GET FiT, small-scale is defined as having installed capacity of 20MW or less.

- **Interconnection component:** The interconnection component subsidizes the construction of infrastructure to help power produced by GET FiT-supported plants flow across the national grid. This should reduce the risk of UETCL having to pay developers for power that could have been supplied, but was not, due to congestion in the power grid (deemed energy).

### 2.3.1 Tendering process

To get GET FiT support, projects were selected through a tendering process. Hydropower, biomass, and bagasse projects were scored on a mix of technical, environmental, and social criteria. Their remuneration is fixed through the existing REFiT, plus a pre-specified GET FiT premium.

Solar projects were chosen through competitive tendering based on premium payments, as well as having to meet technical, environmental, and social standards. The REFiT establishes a fixed payment from UETCL for solar power. The premium payment for solar was then determined through bidding, to fill the gap between the tariff paid by UETCL, and what developers required.

The tenders were run by KfW on behalf of ERA. The tender used standard documents prepared by lawyers hired as consultants by KfW. The first tender was run by KfW with help from independent contractors (for hydropower, biomass, and bagasse). Multiconsult served as tendering consultant for the second and third tenders for hydropower, biomass, and bagasse projects. Agut was tendering consultant for the solar tender.

### 2.3.2 Premium

Successful tenderers benefit from premium payments. The GET FiT premium payments are results-based grant payments that give generators a “top-up” on top of the existing REFiT. The total premium for hydropower, biomass and bagasse projects is fixed for different technologies and installed capacities (see Table 5.3 for a full schedule of tariffs). For solar projects, the premium is established by reverse auction.<sup>16</sup>

The GET FiT premium payments for each project are divided into two types:

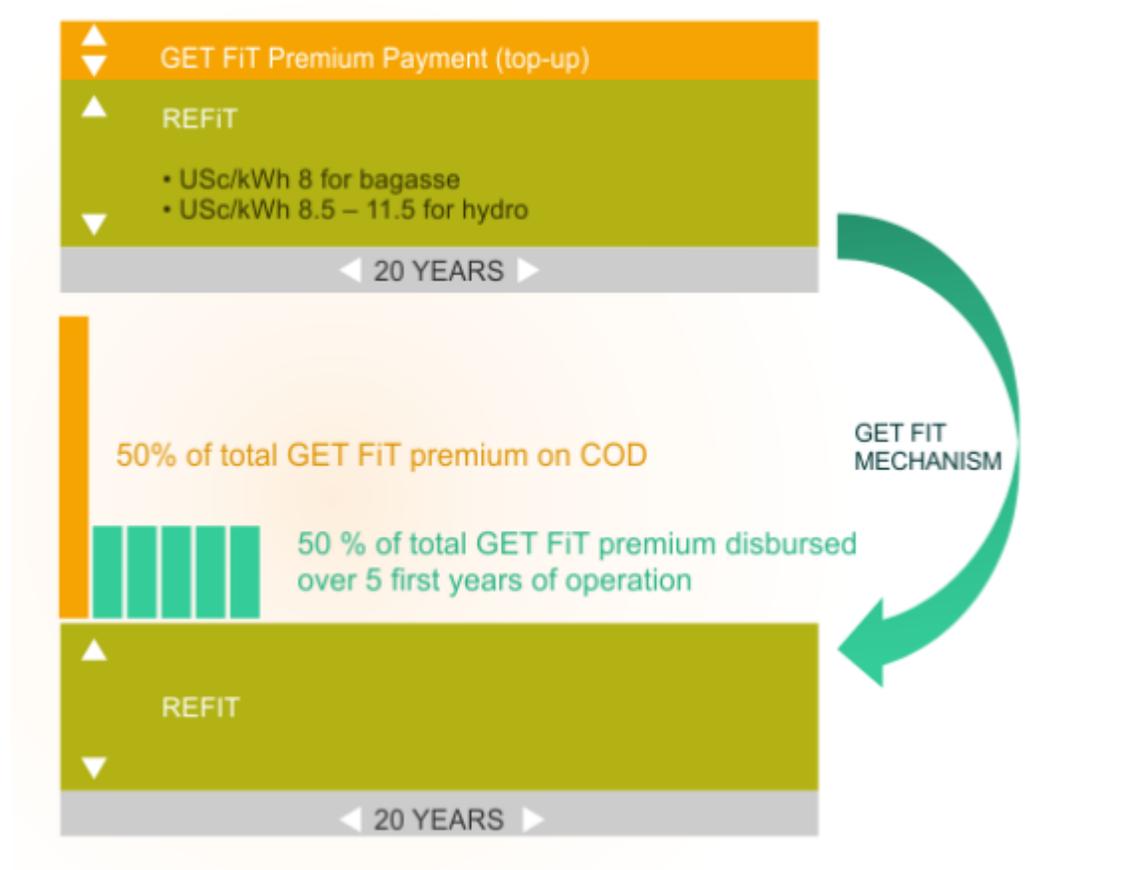
- **An initial payment** equal to 50 percent of the total premium for the project. This is disbursed on the project’s Commercial Operating Date (COD). COD is verified by UETCL, once it has checked that the plant is complete and able to supply power to the grid.
- **Output payments** equal to 50 percent of the total premium for the project. These payments will be proportional to the amount of power produced, in line with the terms of the PPA. These will be made over 5 years.

Figure 2.1 shows how the GET FiT premium payments fit with the REFiT feed-in tariffs. Under a PPA with UETCL, the RE IPP receives REFiT payments for power supplied over 20 years, at the specified REFiT tariff. On the COD the IPP also receives the initial payment from GET FiT, and thereafter the outputs payments for 5 years (also from GET FiT)

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<sup>16</sup> This is an auction where sellers bid the prices at which they are willing to sell their goods or services. This is in contrast to a regular auction, where a seller puts up an item, and buyers bid purchase prices. (<http://www.investopedia.com/terms/r/reverse-auction.asp>)

Figure 2.1: GET FiT Premium Payment Mechanisms and REFiT



Source: GET FiT Annual Report 2013.

Note: The general arrangement above applies to all technologies, regardless of whether the premium is determined through a fixed schedule (hydropower, bagasse, biomass), or competitive bidding (solar).

### 2.3.3 Partial Risk Guarantee

Successful bidders can also obtain PRGs from the World Bank. The PRGs provide compensation to cover certain risks. Three coverage options are available: UETCL payment risk under PPAs, GoU termination payment risk, and commercial debt that is not paid by the project company as result of nonpayment by UETCL or GoU.

### 2.3.4 Interconnection component

Support for deep interconnection infrastructure<sup>17</sup> for GET FiT-supported projects was added later in the life of the program (after the first two non-solar tenders, and before third non-solar tender

<sup>17</sup> Deep interconnection means enabling power to flow from where it is produced to where it will be used. This could include making improvements to the grid far from a power plant, to allow power to reach distant centers of demand. (<http://users.ece.utexas.edu/~baldick/papers/lessons.pdf>)

and the solar tender). The interconnection component provides financial support for the construction and refurbishment of network infrastructure, so that GET FiT-supported projects can successfully evacuate power to the grid. The interconnection component also funds capacity building for ERA on oversight of interconnection and wheeling.<sup>18</sup>

Shallow interconnection means connecting a power plant to the nearest point of the existing grid. For power plants within 5km of the grid, shallow interconnection is paid for by developers. For power plants more than 5km from the grid, this is paid for by the Rural Electrification Agency (REA).

## **2.4 GET FiT Project Process**

GET FiT's project cycle is shown in Figure 2.2, from procurement to provision of subsidies once power plants are operational. First, GET FiT chooses the power plants that are eligible for a subsidy through a competitive tender. Once projects are deemed eligible for GET FiT, subsidy arrangements are finalized in the Developer Financing Agreement (DFA).

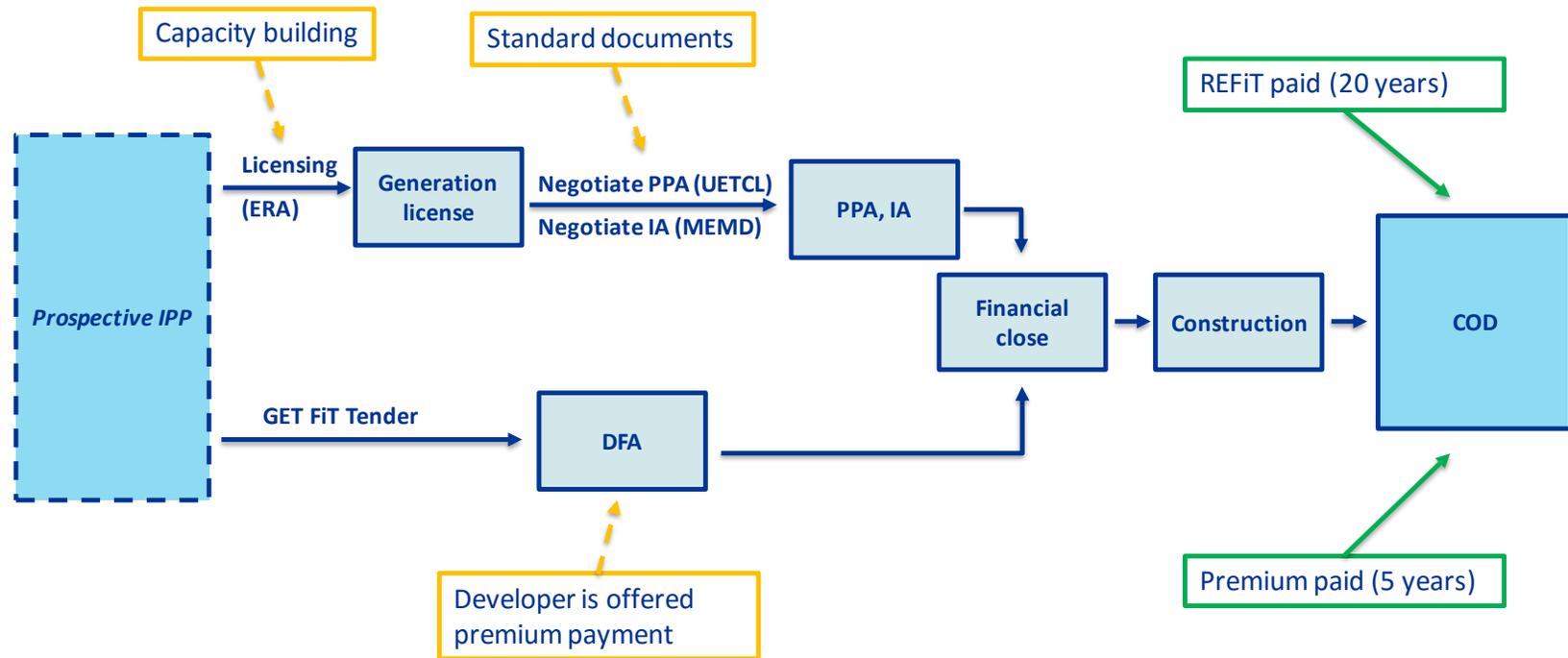
In parallel, the developer must also apply to ERA for a license. If a license is awarded, the developer must then apply to UETCL and negotiate a Power Purchase Agreement (PPA), and negotiate an Implementation Agreement (IA) with MEMD. Once the developer has the DFA, license, PPA, IA and other necessary permits it can typically reach financial close. At this point it can draw down finance from its lenders and equity investors, and construct the power plant. When the plant and connection to the grid are complete it can commence commercial operations. At that point it starts to receive REFiT payments from UETCL, and premium payments from GET FiT.

Once projects have been completed and are operational, they receive GET FiT premium payments and REFiT tariffs for 5 years. For the following 15 years, projects only receive REFiT tariffs.

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<sup>18</sup> The interconnection component funded additional capacity building for ERA that was not part of the original plans for capacity building. The original capacity building focused on tariffs and project due diligence. However, since the capacity building will be analyzed in similar ways, they are discussed together in 5.2.3.

Figure 2.2: GET FiT Project Process



Source: GET FiT Annual Report 2014.

Notes: IA=Implementation Agreement. PPA=Power Purchase Agreement. DFA=Developer Finance Agreement. COD=Commercial Operation Date. GFPPM=GET FiT Premium Payment Mechanism. REFiT=Renewable Energy Feed-in Tariff.

The key points in Figure 2.2 are explained in Table 2.4.

**Table 2.4: Milestones in the GET FiT Project Process**

Milestone	Description
<b>Generation License</b>	This allows a developer to try negotiating a PPA for a specific project with UETCL.
<b>GET FiT Tender</b>	RE projects were selected for support from GET FiT through competitive tendering. Projects needed to demonstrate progress in project preparation and that they were: a) financially and economically sustainable, b) technically sound, c) developed by a developer/sponsor with a reliable project record and d) in compliance with GET FiT's implementation of IFC's Performance Standards on Environmental and Social Sustainability <sup>19</sup> . Solar projects were selected through bid price (the GET FiT premium on top of the average tariff), and had to meet technical, environmental, and social requirements.
<b>Implementation Agreement (IA)</b>	The IA is between the GoU and the private developer. The agreement outlines the responsibilities and obligations of each party.
<b>Direct Agreement</b>	This is an agreement between UETCL and lenders to power projects (not shown in figure)
<b>Power Purchase Agreement (PPA)</b>	The PPA is between the private developer and the off-taker, UETCL.
<b>Developer Finance Agreement (DFA)</b>	The DFA is between the private developer and the GoU, represented by KfW. It specifies the amount of the premium to be paid by GET FiT, and the conditions of disbursement.
<b>Financial Close</b>	Financial close occurs when all the project and financing agreements have been signed and all the required conditions contained in them have been met. This enables funds from debt and equity investors to flow so that implementation can begin.
<b>Construction</b>	This is when projects are built.
<b>Commercial Operation Date (COD)</b>	A project reaches COD when its construction is complete and it is able to supply power to the grid. This is verified by UETCL.
<b>Renewable Energy Feed-in Tariff (REFiT)</b>	This a schedule of fixed tariffs paid by UETCL for different technologies and installed capacities. The REFiT is paid for the full 20-year life of a project.
<b>Premium Payment</b>	This a "top-up" paid by GET FiT on top of the REFiT. The premium is only paid for the first 5 years of a project's operations.

Source: GET FiT Annual Report 2014, interview with Kathrin Kaestle and Stephanie Rieger from KfW., European Investment Bank PPP Guide.

## 2.5 Timeline of Key Events

Table 2.5 shows key events in the GET FiT timeline, with dates.

<sup>19</sup> IFC's Performance Standards are principles rather than precise rules. Different donors implement the standards in different ways (see Section 4.2).

**Table 2.5: Key Events**

Event	Date
RfP 1 Tender issued	March 2013
GET FiT formally launched	May 2013
RfP 1 Final bidders selected	July 2013
Implementation consultant hired	September 2013
RfP 2 Tender issued	November 2013
RfP 2 Final bidders selected	March 2014
World Bank approves PRGs for GET FiT-supported projects	March 2014
GET FiT holds Developer Week to help developers comply with environmental and social requirements and negotiate contracts	June 2014
Solar RfP tender issued	August 2014
Solar RfP final bidders selected	October 2014
RfP 3 tender issued	November 2014
RfP 3 final bidders selected	June 2015
GET FiT holds Developer Workshop to help developers of hydropower projects with environmental and social compliance	October 2015
GET FiT Secretariat staffing reduced to part-time	December 2016

Source: GET FiT Annual Reports for 2013, 2014, 2015.

### 3 Theory of Change and Evaluation Approach

This report presents a theory-based evaluation<sup>20</sup> of GET FiT. That is to say, it tests observed evidence of actual results against a program theory<sup>21</sup> of how the GET FiT program would be expected to bring about certain results.

The program theory is shown as a Theory of Change (ToC). A ToC is a standard way of showing how a policy program should bring about its intended results.<sup>22</sup> A ToC shows how a program's interventions produce a series of outputs and outcomes that help realize the program's intended impacts.

A logframe<sup>23</sup> is a table that parallels the Theory of Change—it shows all the steps in the ToC, and specifies indicators for measuring results at different steps. The logframe can be used to compare actual results against targets. The ToC and logframe together are the foundation of the theory-based evaluation, since the evaluation needs to:

1. See if the planned outputs were delivered, and desired outcomes and impacts were achieved, and
2. See if the outcomes and impacts can be attributed to the program, and if they were caused in the way the ToC hypothesized they would be.

This section presents the Theory of Change, and gives an overview of how it was used to evaluate GET FiT.

#### 3.1 Theory of Change

The current ToC is shown in Figure 3.1. The way to read the ToC is to start from the input group at the top, and read downwards across the different stages of the ToC (inputs, interventions, outputs, program-level outcomes, wider outcomes, and impacts). The stages are defined in Table 3.1.

**Table 3.1: Definition of Key Terms in Theory of Change**

Term	Definition
<b>Input</b>	The financial, human, and material resources used for the development intervention
<b>Intervention</b>	The program's activities, which convert inputs into outputs
<b>Output</b>	The products, capital goods and services which result from a development intervention; may also include changes resulting from the intervention which are relevant to the achievement of outcomes

<sup>20</sup> <http://www.tbs-sct.gc.ca/hgw-cgf/oversight-surveillance/ae-ve/cee/tbae-acat/tbae-acat02-eng.asp#toc1>, [http://betterevaluation.org/resources/guide/theory-based\\_approaches\\_to\\_evaluation](http://betterevaluation.org/resources/guide/theory-based_approaches_to_evaluation)

<sup>21</sup> [http://betterevaluation.org/plan/define/develop\\_logic\\_model](http://betterevaluation.org/plan/define/develop_logic_model)

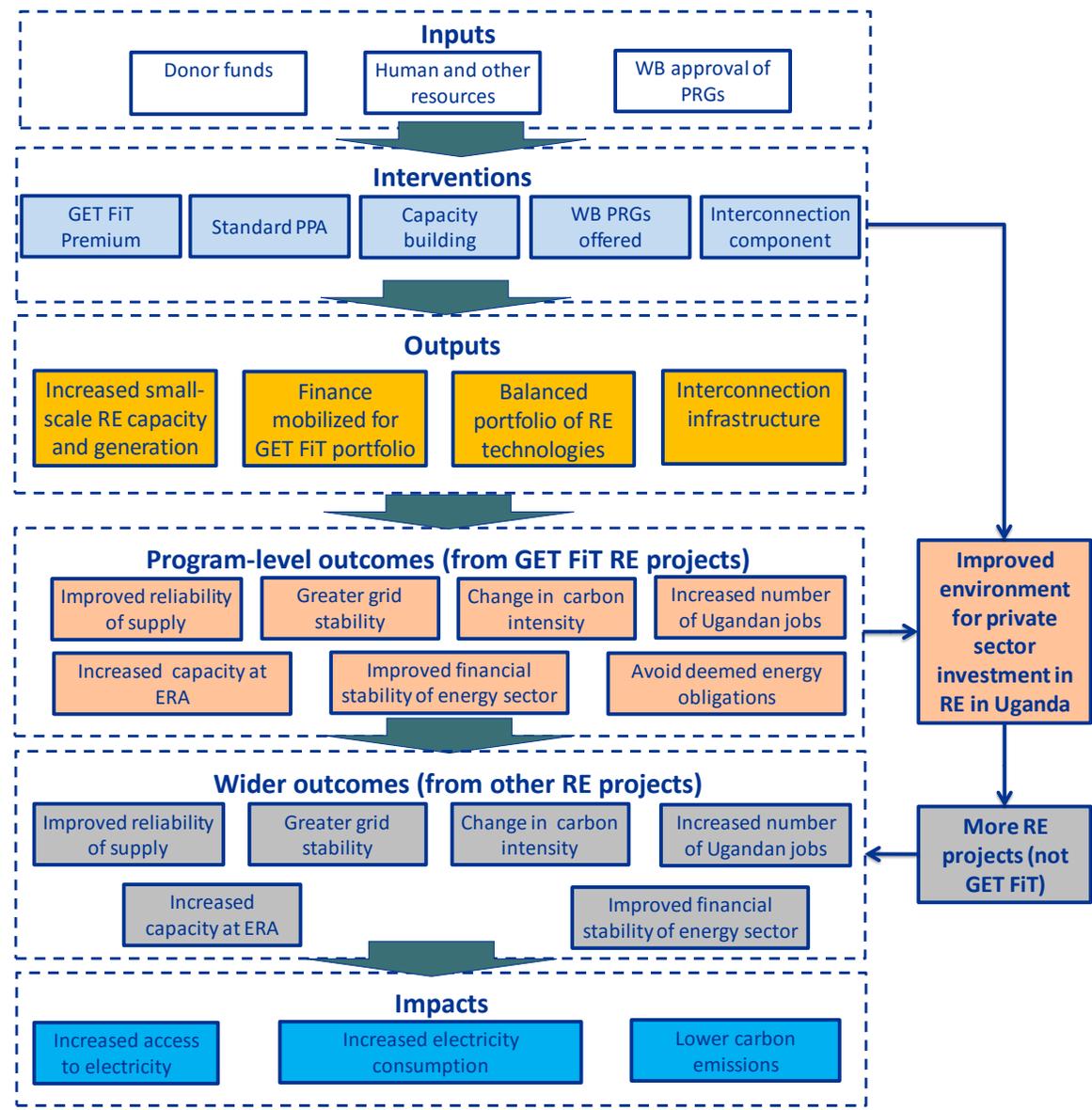
<sup>22</sup> [http://betterevaluation.org/resources/guide/theory\\_of\\_change](http://betterevaluation.org/resources/guide/theory_of_change)

<sup>23</sup> <http://betterevaluation.org/evaluation-options/logframe>

Term	Definition
Outcome	The likely or achieved short-term and medium-term effects of an intervention's outputs
Impact	Positive and negative, primary and secondary long-term effects produced by a development intervention, directly or indirectly, intended or unintended

Source: OECD Glossary of Key Terms in Evaluation and Results Based Management (<http://www.oecd.org/development/peer-reviews/2754804.pdf>).

Figure 3.1: Improved Theory of Change



Broadly, this ToC shows that donor resources are converted into five interventions which ultimately lead to the desired impacts of increased access to electricity, increased electricity consumption, and lower carbon emissions.

The interventions, which were described in more detail in Section 2, are:

- A premium payment on top of the existing Renewable Energy Feed-in Tariff (REFIT)
- Standardized PPAs and other legal documents
- Capacity building for the regulator (ERA)
- Partial Risk Guarantees (PRGs) from the World Bank
- Support for interconnection infrastructure.

The five interventions all facilitate the provision of the program's outputs.

Three of the four outputs are intended to be a direct result of power plants being built: increased small-scale RE capacity and generation, finance mobilized for GET FiT portfolio, and a balanced portfolio of RE technologies (within GET FiT). The other output is interconnection infrastructure, which should help electricity flow across the grid to where it will be consumed.

The outputs and interventions should facilitate the provision of program-level outcomes. RE power plants are expected to improve reliability of supply, increase grid stability, and lower the carbon intensity of electricity generation in Uganda (the amount of carbon emitted per unit of electricity produced). GET FiT power plants were intended to improve the financial stability of the power sector by displacing expensive thermal generation. Building, operating, and maintaining power plants should also create jobs. The capacity building aims to increase ERA's ability to carry out some of its key functions.

The outputs and interventions are also intended to facilitate wider outcomes. These are expected to stem from an improvement investment environment, enabling RE power plants to be built without support from GET FiT. The link from an improvement investment environment to wider outcomes is shown by the two boxes on the right side of Figure 3.1. The program-level outcomes and wider outcomes should help bring about the impacts of increased access to electricity, increased electricity consumption and lower carbon emissions.

The logframe contains indicators to track the provision of outputs, and the attainment of outcomes and impacts. The logframe with results to date is shown in Section 3.2.

## **3.2 Overview of Evaluation Approach**

This subsection presents a high-level overview of how the ToC guided the approach to the evaluation questions in this report. The Theory of Change will be even more important in the next two reports in this evaluation, in which more of the evaluation questions will be addressed. The detailed approach is shown in the technical annexes (especially 0 on attribution).

As a theory-based evaluation<sup>24</sup> of GET FiT, observed evidence was tested against the ToC. The effect of GET FiT's interventions to observed results was analyzed through process tracing (see Collier<sup>25</sup>). Evidence was collected on what happened. This evidence was then tested against the expected causal pathways. The pathways were tested by interviewing stakeholders involved in GET FiT. The methodologies used for interviews and surveys are described in more detail in the appendices.<sup>26</sup>

Attribution of results to GET FiT was analyzed by determining whether GET FiT's interventions were necessary or sufficient (or both, or neither) to bring about the observed results. This was done through a combination of contribution analysis (which helps identify potential causal links from interventions to results), and process tracing (which helps assess the quality of evidence in favor or against the potential causal links). The analysis of attribution focused on the importance of each of GET FiT's five interventions in removing barriers to investments in RE power plants (the interventions are described in Section 5.2).

Our analysis assumes that things specific to Uganda but not a result of the intervention—such as relatively good power sector structure, cost-competitiveness of renewable power against thermal power, a relatively stable regulatory regime, and reliable enforcement of contract law—would have existed without GET FiT. It follows that these factors would be the same in both the factual and counterfactual scenarios. This means that conclusions about whether GET FiT was necessary or sufficient are specific to Uganda. The extent to which the results would apply in countries which differ in some of the fundamentals described above would have to await cross-country research.

The process tracing employed a realist approach<sup>27</sup>, to yield useful insights about what works, how, to what extent, and in what circumstances. We reached conclusions about the importance of the GET FiT program to power plants by aggregating findings on which interventions were important for which power plants, and how so. To draw conclusions on what works in different circumstances we looked at different circumstances in Uganda, such as the characteristics of the site where the project was developed, and the previous experience of the project developer in Uganda. Because the research is only in Uganda, and GET FiT has so far only operated in Uganda, it was not possible to draw conclusions on how GET FiT would work in other countries with circumstances quite different from Uganda.

The technical approach to attribution is explain in 0.

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<sup>24</sup> <http://www.tbs-sct.gc.ca/hgw-cgf/oversight-surveillance/ae-ve/cee/tbac-acat/tbac-acat02-eng.asp#toc1>, [http://betterevaluation.org/resources/guide/theory-based\\_approaches\\_to\\_evaluation](http://betterevaluation.org/resources/guide/theory-based_approaches_to_evaluation)

<sup>25</sup> Collier, D. “Understanding Process Tracing”.

<sup>26</sup> The quantitative surveys will be used to develop case studies on how two GET FiT projects effect their immediate environs. The surveys will not be used to test causal pathways.

<sup>27</sup> [http://betterevaluation.org/approach/realist\\_evaluation](http://betterevaluation.org/approach/realist_evaluation). This approach was agreed with the client in the methodology in this project's Inception Report.

## 4 Effectiveness

According to the OECD DAC Evaluation Criteria, effectiveness is a measure of the extent to which an aid activity attains its objectives. This section discusses GET FiT's performance in meeting its goals. First, GET FiT's performance in reaching output goals is shown. Next, the performance in outcomes and impacts is shown. This is followed by a discussion of the challenges and opportunities faced by GET FiT.

GET FiT has two types of goals:

- **Targets** to be reached by 2023
- **Milestones** for each year until 2023.

(Note the logframe received from the monitoring consultant shows milestones through 2017. Before the Second Performance Review and Evaluation Report, Castalia will agree with KfW on future milestones to cover the remaining years until 2023.)

### 4.1 PRQ1 and PRQ1b

**To what extent have the output, outcome, and impact targets and milestones been met?**

At the end of 2015, GET FiT had met about 33 percent of its output targets. The remaining 67 percent of output targets were not close to being met. Table 4.1 shows GET FiT's general progress in meeting output targets.

**Table 4.1: Progress Toward Output Goals, Summary**

Status	2014		2015	
	Count	Percent	Count	Percent
Met or exceeded	1	25%	2	33%
Close	0	0%	0	0%
Not close	3	75%	4	67%

Details on progress towards individual indicators can be found in Appendix A.

The program has fallen behind in meeting its output targets largely because only one GET FiT-supported power plant is currently online. The program had hoped to have 28MW of capacity operational across multiple power plants by the end of 2015. Instead, only the Kakira power plant is operational, with 20MW of installed capacity, and it only started selling power under the GET FiT PPA in the second half of 2015.

Kathrin Kaestle from KfW said that the installed capacity target was not met because the SAIL project was removed from the program. SAIL was removed due to failure to comply with environmental and social standards.

At the end of 2015, GET FiT had met, or come close to meeting, about 60 percent of its outcome targets. Table 4.2 shows GET FiT's general progress in meeting outcome and impact targets.

**Table 4.2: Progress Towards Outcome and Impact Goals, Summary**

Status	2014		2015	
	Count	Percent	Count	Percent
<b>Outcomes</b>				
Met or exceeded	6	35%	17	81%
Close	9	53%	1	5%
Not close	2	12%	3	14%
<b>Impacts</b>				
Met or exceeded	4	80%	2	40%
Close	1	20%	1	20%
Not close	0	0%	2	40%

Details on progress towards individual indicators can be found in Appendix B.

The shortfall against target is largely due to only one GET FiT-supported power plant having entered commercial operations. GET FiT has met, or come close to meeting, about 57 percent of its impact targets. The realization of outcomes and impacts will be discussed in more depth in the second report in this engagement.

## 4.2 PRQ2, PRQ2a, PRQ2b, and PRQ4:

### How have challenges and opportunities impacted on the delivery of GET FiT's outputs? How did GET FiT respond to challenges and opportunities?

This question aims to understand how GET FiT responded to challenges and opportunities, and how these impacted the program. For the purposes of this report, a challenge is defined as “something unexpected that hindered the program’s operations”. An opportunity is “something unexpected that could be, or could have been, exploited beneficially by the program”. We did not identify any opportunities that were missed or exploited by the program.<sup>28</sup> Thus, this section focuses on challenges and how they were responded to.

We looked for challenges and opportunities by reviewing GET FiT Annual Reports, and by interviewing stakeholders. The main challenges that arose for GET FiT are:<sup>29</sup>

- **Tax uncertainty:** Tax uncertainty stalled nearly all hydropower projects for three months. GET FiT helped resolve the problem by engaging with GoU to clarify taxation.
- **Exchange rate variations:** Exchange rate movements reduced the total funding available for GET FiT, in Euros, which ultimately reduced the planned installed capacity to be supported by the program by 13 percent. GET FiT responded to this

<sup>28</sup> One example of an opportunity would be another donor program offering subsidies for small hydropower projects in the GET FiT portfolio. This could allow GET FiT to reduce the size of its premium payments, but spread them across more projects. Such an opportunity did not arise.

<sup>29</sup> Some potential challenges mentioned in Chapter 5.2.3 of the Inception Report did not surface, and thus are not discussed. Those are: low geographic diversity of projects; delays in construction after PPAs are signed; UETCL not paying for power; and adverse macroeconomic or political conditions.

by fixing the exchange rate used for premium payments, and accelerating payments in other currencies from partner donors.

- **Low technical diversity of projects:** GET FiT's portfolio of projects is heavily weighted towards hydropower. There is only one bagasse project, and no biomass projects. GET FiT tried to work with developers of bagasse and biomass projects to bring them into the program, but this did not achieve the desired results.
- **Developers struggling to meet GET FiT's environmental and social standards:** Over 50 conditions precedent related to environmental and social standards have been applied to projects in the GET FiT portfolio. These conditions precedent impose additional work on developers before they can draw on GET FiT support. To improve developers' applications, and so reduce the imposition of conditions precedent, GET FiT ran two workshops to help developers and their consultants better understand the environmental and social standards.

It is useful to classify challenges faced as either inside or outside GET FiT's control. We use 'being within the program's control' as meaning GET FiT had a real ability to influence the matter in question.

### **Tax uncertainty**

**Description:** Two developers and one lender (with a total of seven projects between them) said VAT uncertainty caused big delays for hydropower projects. The background is that GoU introduced new tax legislation in August 2014. Because of this legislation, developers were worried that they would lose various tax benefits for hydropower projects, including: a tax exemption for spending on studies and supplies for hydropower projects; and an initial capital allowance, which deducts 75 percent of capital expenditure from profits.

Tax issues also delayed the Tororo solar project supported by GET FiT. Tororo's developer said there was confusion about taxation of some products and services used in solar power plants.

**Response:** KfW and the GET FiT Secretariat engaged with GoU to resolve both tax issues.<sup>30</sup> Developer 4 said the tax question was "a huge battle" where GET FiT was very helpful in finding a solution. The Uganda Revenue Authority issued a clarifying ruling on 13 November 2014 for all technologies other than solar. The solar tax question is expected to be resolved in May 2016, with a tax arrangement similar to the one for hydropower.<sup>31</sup>

The clarifying ruling indicated that: (1) VAT exemptions would be upheld for supplies for hydropower, however, any project preparation costs incurred before signing the PPA would be subject to VAT; and (2) The removal of the initial allowance would be cushioned by accelerated depreciation under the Income Tax Act.<sup>32</sup>

**Tax policy is not under GET FiT's control.** Tax policy is determined by the Government of Uganda.

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<sup>30</sup> GET FiT Annual Report 2014

<sup>31</sup> Interview with Simba.

<sup>32</sup> GET FiT Annual Report 2014. Developer 9 confirmed this in an interview.

**Result:** Uncertainty over tax stalled nearly all hydropower projects for three months.<sup>33</sup>

One developer said that taxes were not a problem because it already had an active PPA in Uganda. The developer already had country knowledge and people on the ground, so its project was not slowed down.

No projects withdrew from GET FiT because of tax uncertainty. Kathrin Kaestle believes that over-coming the tax challenge brought the benefit of “bonding” between developers and GET FiT as they worked to solve the problem.

**Lessons:**

- More or earlier coordination with government could help reduce or avoid delays due to tax uncertainty.

**Exchange rate variation**

**Description:** Two exchange rate movements have reduced the total amount of funding in Euros available for GET FiT:

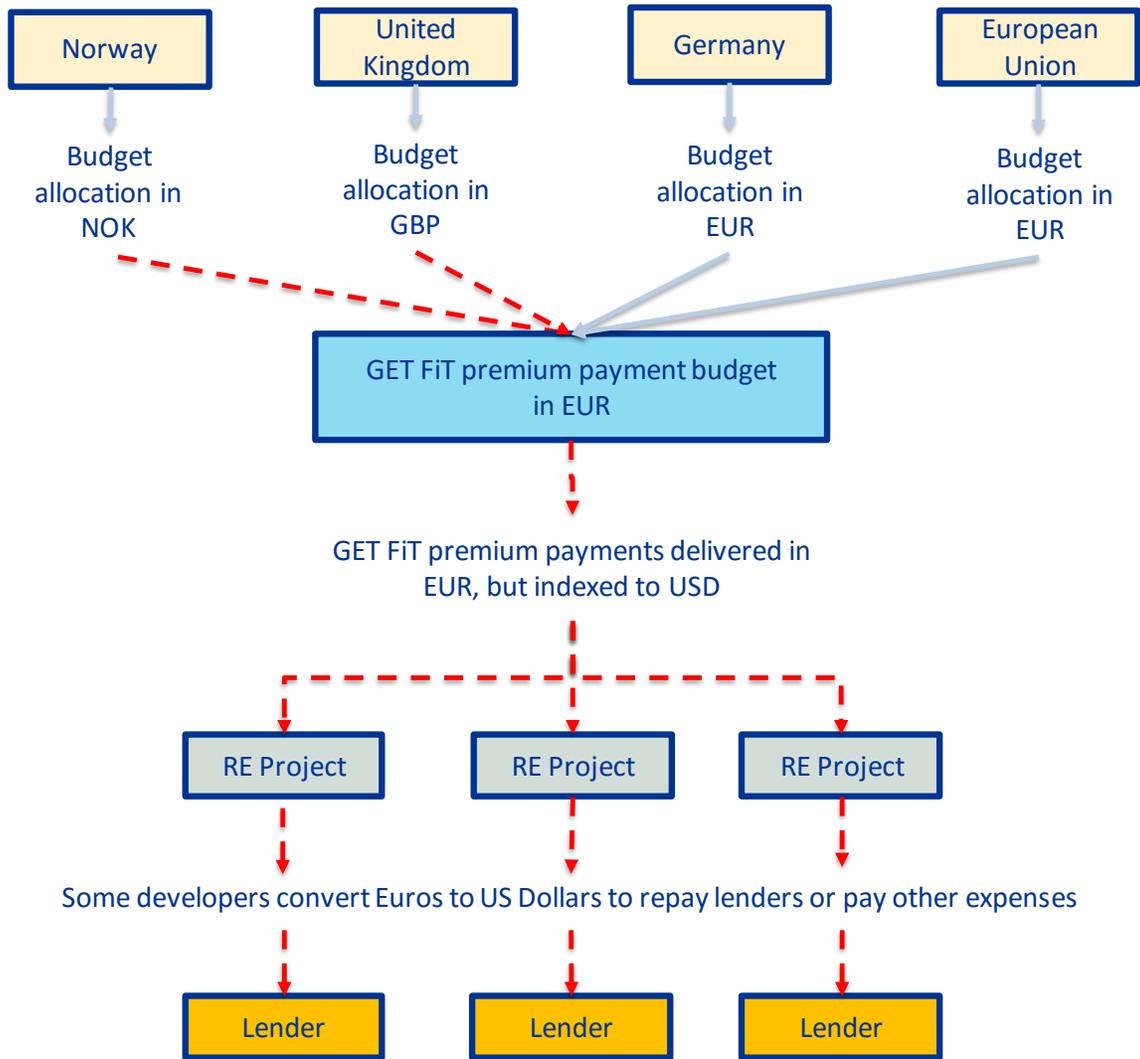
- Depreciation of the Euro (EUR) against the US Dollar (US\$)—this increases the premium payments in EUR terms, as the payments are delivered in EUR but defined in US Dollars (indexed against US Dollars). This is equivalent to the US Dollar appreciating against the Euro.
- Depreciation of the Norwegian Krone (NOK) against the Euro—This reduces funding flows in to GET FiT in Euro terms, as the Government of Norway allocates its budget in NOK, but GET FiT’s budget is in EUR. This is equivalent to the EUR appreciating against NOK.

Figure 4.1 shows the monetary flows to and from GET FiT, and which ones are exposed to exchange rate variation.

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<sup>33</sup> GET FiT Annual Report 2014. One lender (Lender 1) corroborated this 3-month stall for Project 11, developed by Developer 3. One developer with five projects (Developer 4) did not specify the time period but said that VAT uncertainty caused big problems.

Figure 4.1: Exchange Rate Variation in GET FiT Monetary Flows



Note: Dashed lines (red) indicate where exchange rates can vary (either helping or hurting GET FiT)

Figure 4.2, Figure 4.3 and Figure 4.4 show that the Euro has recently depreciated against the US Dollar (Figure 4.2), depreciated against the British Pound (Figure 4.3), and appreciated against the Norwegian Krone (Figure 4.4).

Figure 4.2: Exchange Rate over the Last 5 years (US Dollars per Euro)



Source: Bloomberg.com, 31 March 2016, 12:12pm

Figure 4.3: Exchange Rate over the Last 5 years (Euro per British Pound)



Source: Bloomberg.com, 31 March 2016, 12:12pm

**Figure 4.4: Exchange Rate over the Last 5 years (Euro per Norwegian Krone)**



Source: Bloomberg.com, 31 March 2016, 12:12pm

**Response:** In mid-2015, the GET FiT Investment Committee fixed the US Dollar-Euro exchange rate for all remaining projects which had not signed DFAs. Previously, the market exchange rate was used. The exchange rate was fixed at the closing day of the fifth IC Meeting, at US\$1.128 per EUR. This would apply to all projects which had not yet signed a DFA. The DFA exchange rate is used to index Euros against US Dollars. Payments are disbursed in Euros, but defined in US Dollars.

As shown in the bottom portion of Figure 4.1, this arrangement puts exchange rate risk on developers. They receive payments from GET FiT in Euros, but some of them incur expenses and service loans in US Dollars. If the US Dollar were to strengthen against the Euro (equivalent to the Euro weakening against the US Dollar), then the developers would need to use more Euros to make their US Dollar-denominated loan repayments. The premium payments will be worth less in US Dollar terms. Exchange rates could also move in the opposite direction, and developers would gain by having the value of the premium payments rise in US Dollar terms.

GET FiT also reacted to exchange rate variation in donor funding payments in currencies other than Euros (from Norway, and some of the UK funding). KfW worked with those donors to accelerate disbursements of funding, so more money would be received in Euros sooner.<sup>34</sup> This seems like a pragmatic and proactive response to exchange rate risk in funding flows.

Developer 4, a developer with five projects in the portfolio, thought a better approach would be for GET FiT to just disburse subsidies in US Dollars. Developer 4 pointed out that this was a common approach in other donor projects. Knowing that subsidies would be disbursed in US dollars would have reduced risks for developers. Disbursing payments in US Dollars could also have reduced the risk of the funding available for premium payments being inadequate. The program could have entered futures contracts to lock-in ahead of time the exchange rate at which the other currencies could be changed into US dollars. This could have

<sup>34</sup> Kathrin Kaestle from KfW

given certainty on the number of US dollars that would be available to disburse. However, KfW says it is not allowed to disburse payments in currencies other than Euros,<sup>35</sup> and so these problems were unavoidable.

**Result:** Exchange rate fluctuations have resulted in the pool of Euros available for premium payments being reduced by 13 percent. The total amount of MW to be subsidized by GET FiT was correspondingly reduced from 170MW to 155MW. Exchange rate risk has been shifted on to those developers who incur costs and borrow in US Dollars.<sup>36</sup>

One developer said fixing the exchange rate

*“definitely did affect our ability to repay loans and cover other expenses—simply because of the fact that all our project costs are in [US Dollars], and, as you know, the Euro has fallen significantly to the [US Dollar]. That significantly affected our IRR [internal rate of return] & DSCR [debt service coverage ratio]”.*

Another developer, who incurs debt and other expenses in US Dollars, said:

*“Since the [Euro] has appreciated against the [US Dollar] recently (only on this April) the impact is not adverse at the moment given that our loan repayments or interest servicing has not started yet. However, [during the] majority of the time during the last year after fixing the rate, [the Euro] was weaker than the fixed rate which could have adverse impact if debt servicing [had] started”.*

For developers incurring significant expenses in Euros, this is less of a problem. One such developer said

*“It does not cause a crisis for us—but is an inconvenience and something that should ideally be changed in future projects...We specifically have a [Euro] component in the CAPEX which crudely hedges the GET FiT [Euro foreign exchange] exposure”.*

**Findings:**

- Exchange rate risk is significant for funding inflows. Accelerating the disbursement of funding can help mitigate this risk.
- Exchange rate risk in subsidy outflows can have a significant impact on the amount of electricity provided by a program. Fixing the exchange for subsidy payments shift risks from donors to recipients of subsidies.

**Low technical diversity**

**Description:** Technical diversity is defined in the logframe as the number of technologies that are selected to receive support from GET FiT. The program aimed to support four technologies: bagasse, biomass, hydropower, and solar. The program ended up supporting three of those four technologies: bagasse (one project), hydropower (14 projects), and solar

<sup>35</sup> Kathrin Kaestle from KfW

<sup>36</sup> Five lenders with GET FiT-supported projects lend in US Dollars. Those lenders are Lender 1, Lender 3, Lender 5, Lender 2, and Lender 4. Between them, they have lent, or plan to lend, to 13 projects in the GET FiT portfolio (76 percent). This excludes Achwa 3, which is on the reserve list. It also plans to borrow from FMO in US Dollars.

(two projects). No biomass projects are supported by the program. The program portfolio is heavily weighted towards hydropower.

Biomass and bagasse power plants tend to be developed by large agribusinesses, especially in Africa.<sup>37</sup> Small farms, especially in a country like Uganda, would likely not be able to arrange millions of dollars to finance power plants. It is theoretically possible that developers could build a biomass or bagasse project that is not directly linked to a farm, and then procure fuel from elsewhere. However, this is challenging. It requires the developer to secure reliable feedstock from numerous small farmers, over a 20-year period.<sup>38</sup>

There are few large commercial farms in Uganda that produce biomass suitable for fuel. The developer of PH Industrial Farm mentioned this in an interview. This was corroborated in research by Castalia, which found that there are four large sugar producers in Uganda (Kakira, Kinyara, SAIL, and Sugar Corporation of Uganda). There are also two large tea producers.<sup>39</sup>

Given the scarcity of large agribusiness in Uganda, GET FiT actually did well in inducing two of the four large sugar producers to submit bids (Kakira and SAIL). One biomass project, PH Industrial Farm, was selected for support by GET FiT. This project was later withdrawn from GET FiT by its developer. The developer confirmed by email that the main challenge for this project was delays in getting the agricultural side of the farm operational (this is where corn waste for fuel would be produced). This corroborates Multiconsult's claim that the project was withdrawn due to inability to obtain an adequate fuel supply.

The relative scarcity of solar projects is not a problem. The program aimed to support a total of 20MW of solar capacity, which it is doing. These projects are the first grid-scale solar projects in Uganda.

**Response:** GET FiT tried to work cooperatively with the developers of SAIL and PH Industrial Farm to keep them in the program. For SAIL, KfW provided a grant to help it with E&S studies through the UECCC program. Still, SAIL's support from GET FiT was revoked due to failure to make adequate progress in complying with IFC PS. GET FiT also talked with PH Industrial Farm to try finding way forward, but PH Industrial Farm required more time than GET FiT could give.

**Result:** No biomass projects, and only one bagasse project, are being supported by GET FiT. This means that GET FiT is only supporting three technologies (bagasse, hydropower, solar), which falls short of the target of four technologies. The portfolio is heavily weighted towards hydropower.

**Findings:**

- Given the scarcity of large commercial farms in Uganda, GET FiT did well in attracting bids from three of four large sugar producers in the country.

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<sup>37</sup> Expert opinion of a Castalia employee specialized in financing of RE in Africa.

<sup>38</sup> "Biomass for Power Generation" by IRENA, June 2012. This report also discusses bagasse.

<sup>39</sup> "Market Scan, Agribusiness in Uganda" By Dr. Rita Laker-Ojok, 2012. Written for the Embassy of the Netherlands to Uganda.

## Developers struggling to meet GET FiT's environmental and social standards

**Description:** GET FiT required projects to demonstrate compliance with IFC Performance Standards (IFC PS). These performance standards are not in fact standards in the normal sense of the word, but rather a set of principles created by the IFC (a division of the World Bank Group) to help to

*identify [social and environmental] risks and impacts, and ... avoid, mitigate, and manage risks and impacts as a way of doing business in a sustainable way, including stakeholder engagement and disclosure obligations of the client in relation to project-level activities.<sup>40</sup>*

As principles, not hard rules, the performance standards are open to interpretation. To paraphrase Stephanie Rieger, GET FiT's first Project Manager, "if you put three experts on environmental and social standards in a room, you end up with nine different interpretations".

At least one DFI (OPIC) is more demanding than GET FiT in the application of the IFC PS. One highly experienced developer said that OPIC was the most demanding DFI that he has worked with.

GET FiT's application of the IFC PS was, on the other hand, more demanding than some DFIs. One developer said he sent GET FiT the same E&S submission materials that were acceptable to FMO (a DFI that helped create IFC PS), but unacceptable to GET FiT. Mr. Harklau said that many projects were in compliance with their lenders' implementation of IFC PS, but not compliant with GET FiT's.

On the other hand, the demanding application of IFC PS by GET FiT meant that three lenders (two DFIs, one commercial lender) saw no need to do further E&S review of their own. They were able to rely on the review done by GET FiT

While we have no reason to think that GET FiT's application of IFC PS was too demanding, problems arose because GET FiT did not clearly convey how it would apply the IFC PS. Two developers accustomed to dealing with international donors found the rules to be far stricter than expected. One developer found that GET FiT's feedback on E&S compliance was not very helpful. The feedback pointed out high-level problems, but did not indicate problems with enough specificity to give a clear idea of how to resolve them. Another developer said that "The meaning of IFC Performance Standards was not well communicated to the developer pool".

A review of the solar tender commissioned by KfW agreed that GET FiT did not clearly communicate what would be expected for compliance with IFC PS, and recommended that:

*In order to reduce transaction costs, the bid documentation should be clearer around what level of compliance with IFC Performance Standards is necessary by which stage of project development, bid submission, financial close and COD.<sup>41</sup>*

Mr. Harklau agreed that it would be helpful to more clearly explain the E&S requirements for different stages of project development.

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<sup>40</sup> [http://www.ifc.org/wps/wcm/connect/115482804a0255db96fbffd1a5d13d27/PS\\_English\\_2012\\_Full-Documents.pdf?MOD=AJPERES](http://www.ifc.org/wps/wcm/connect/115482804a0255db96fbffd1a5d13d27/PS_English_2012_Full-Documents.pdf?MOD=AJPERES)

<sup>41</sup> The review was written by Anton Eberhard and Raine Naudé from the Graduate School of Business, University of Cape Town, and Brigitte Baillie from Webber Wentzel.

Clear communication was important given that E&S compliance in Uganda is not strictly enforced in normal practice. One consultant who worked with GET FiT said there is a gap between theory and practice in environmental review in Uganda. The frameworks and policies are good, and very close to international standards. However, some projects that struggled with GET FiT's E&S requirements had no problem meeting local standards. When developers approached DWRM (Department of Water Resource Management), DWRM had no guidance to give. DWRM just asked developers to file plans.

**Response:** After the problem became apparent, GET FiT created E&S workshops to educate developers on how to comply with IFC performance standards as interpreted by GET FiT. The first workshop was on IFC PS in general. The second was focused on the specifics of the construction phase. These workshops were a helpful response to the challenge after it arose. In addition to organizing workshops, Mr. Harklau offered to talk with developers on terms of reference for E&S reviews.<sup>42</sup>

The workshops were not part of the planned program budget. KfW and its consultants indicated that helping developers meet IFC PS was harder than expected, and required more resources than planned. This was mentioned in interviews by Stephanie Rieger (GET FiT's first Project Manager), the E&S specialist at Multiconsult, (Svein Erik Harklau), and the Program Manager at Multiconsult (Joakim Arntsen).

**Results:** The difficulties developers had in complying with GET FiT's interpretation of IFC PS are reflected in the numerous conditions precedents inserted in GET FiT support agreements. The GET FiT Annual Report 2015 says that there have been "extensive" conditions precedent (CPs) in relation to IFC PS. Over 50 such CPs were applied across RfP 1, 2, and 3. These CPs were typically requirements for the project developer to do additional environmental or social compliance work before it could receive support from GET FiT.

Mr. Harklau thought it could have been helpful to provide developers information on commonly faced E&S challenges for each technology. Since GET FiT has supported just three technologies, which would have been a manageable task. Such information could have reduced developers' costs and helped them to proceed faster.

**Finding:**

Some developers thought that GET FiT did not clearly explain it would implement E&S standards. GET FiT's implementation of E&S standards was more demanding than some other DFI's, but less demanding than OPIC's.

**Recommendation:**

- Clear, detailed communication on E&S standards at the start of the tender process could help developers comply with any given interpretation of IFC PS. Such communications could include information on commonly faced issues for certain technologies.
- Where implementation consultants are used, communicating to developers in detail what they need to do to comply should be part of the consultant's terms of reference.
- Coordination between GET FiT and lenders to GET FiT supported projects on how IFC PS will be applied can reduce costs for the program overall.

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<sup>42</sup> Interview with Svein Erik Harklau.

*Confidential*

## 5 GET FiT's Effect on Investment in Renewable Energy

This section discusses how GET FiT has changed the market for RE investment in Uganda, and what impact these changes have had. It answers the question *EQ1: To what extent has GET FiT led to a change in the volume of private investment in RE projects in Uganda?*

As of 30 April 2016, only one GET FiT-supported power plant has reached commercial operations. An additional 16 power plants have been selected for GET FiT support and are expected to be commissioned in coming years. The review reports due in 2017 and 2019 will be able to say more about GET FiT's results in realizing investments in power plants.

At this point, the focus is on how GET FiT has helped support investments. We researched this while stakeholder's memories are fresh. Power plants take years to be built, so, many key decisions for GET FiT projects have already been made. Over time, participants' memories of why they made decisions will fade.

The analysis suggests that GET FiT's interventions were necessary for all 17 projects in the GET FiT portfolio. It is likely that none of them would have proceeded without GET FiT. However, GET FiT was probably not sufficient for the projects to go ahead. As described in Section 3.2, the Ugandan context is also important, for example in having a legal environment that makes PPA's enforceable, a financially viable power sector, and high quality hydro-resources that are competitive with the conventional power alternatives Uganda has used in the past. Without these factors, it is unlikely that the GET FiT would have been successful in attracting private finance to renewable generation.<sup>43</sup>

Findings on necessity, and the contribution of each of the GET FiT interventions, are discussed in Section 5.2. First, trends in investment in RE in Uganda are described, to provide a baseline for the analysis in this report and subsequent reports (Section 5.1)

### 5.1 Trends in Investment in Renewable Energy

To understand if and how GET FiT changed the volume of private investment in RE, it is important to first establish the general trend in investment. The basic data are presented in Figure 5.1. Looking at installed capacity as a whole, the major event is clearly the commissioning of the Bujagali Dam in 2012. This is what accounts for the jump in installed capacity, from under 600MW, to over 800MW that year. This additional capacity ended power rationing in Uganda, and also allowed UETCL to largely cease running the expensive thermal capacity that had been installed in 2008 and 2010.

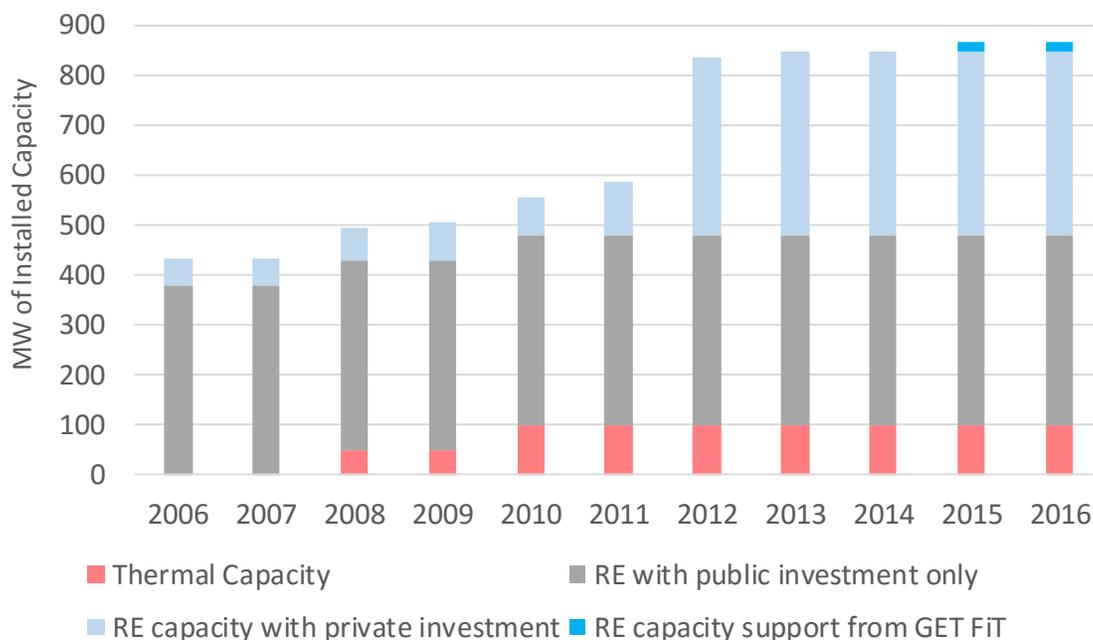
Concerning the extent of renewable generation on the grid, the data show that in 2006 Uganda's generation capacity was 100 percent renewable. The addition of thermal generation to meet growing demand for power brought the percentage of renewables on the grid to a low

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<sup>43</sup> "Making Causal Claims" by John Mayne describes a sufficient cause as a cause that can bring about a result entirely on its own—that is to say, no other events or conditions have to be in place for the result to occur. A different definition of sufficiency is also possible. This is that the intervention was sufficient to cause the result, given that all else remained unchanged (*ceteris paribus*). Compared to a counterfactual in which all else remained the same in Uganda, our analysis suggests that GET FiT was sufficient to make the investment happen. In other words, nothing more than GET FiT needed to be added to the Ugandan situation to attract private finance to renewable energy generation.

of 82 percent in 2010—still much higher than most countries. In 2012, Bujagali brought the share of renewable capacity on the grid up to 88 percent.

**Figure 5.1: Installed Generation Capacity from 2006 to April 2016**



Source: Power Planning Committee Briefing Paper: Uganda’s Electricity Demand and Supply Situation in Medium Term, received from UEGCL (2014). Websites of African Development Bank, European Investment Bank, Norfund, Private Infrastructure Development Group, World Bank, and some project developers.

Looking at levels of private investment in renewable generation we can see that 12 percent of renewable generation capacity had some private investment in 2006. In 2012, the commissioning of Bujagali brought that to 49 percent.

Given the time it takes to develop power plants, especially hydro plants, it is not surprising that few plants supported by GET FiT have yet been commissioned. It is likely that at least 11 power plants will come online in the next few years, as 11 GET FiT DFAs have been signed. GET FiT has selected a total of 17 power plants for support from the program, so another six power plants could be reasonably expected to come online later. Results will be reported and analyzed in the next two reports in this engagement.

The projects approved for support from GET FiT are shown in Table 5.1. Figure 5.1 also shows the projects that are on reserve or are no longer supported. For each project the tender round it was selected in, and its progress through key milestones in reaching COD.

Table 5.1: Status of Projects in GET FiT

Project name	Technology	Capacity (MW)	Status in GET FiT	Selected in	PPA signed	Financial close	Construction started	Commissioned
Kakira	Bagasse	20	Approved	RfP 1	✓	✓	✓	✓
Kikagati	Hydro	16	Approved	RfP 1				
Nengo Bridge	Hydro	6.7	Support revoked	RfP 1				
Nyamwamba	Hydro	9.2	Approved	RfP 1	✓		✓	
Rwimi	Hydro	5.5	Approved	RfP 1	✓		✓	
Siti I	Hydro	6.1	Approved	RfP 1	✓	✓	✓	
Siti II	Hydro	15	Approved	RfP 1	✓			
Waki	Hydro	4.8	Approved	RfP 1	✓		✓	
Lubilia	Hydro	5.4	Approved	RfP 2	✓			
Muvumbe	Hydro	6.5	Approved	RfP 2	✓	✓	✓	
PH Industrial Farm	Biomass	1	Withdrawn by developer	RfP 2				
SAIL	Bagasse	6.9	Support revoked	RfP 2				
Sindila	Hydro	5	Approved	RfP 2	✓			
Kyambura	Hydro	7.6	Approved (formerly in reserve)	RfP 3				
Ndugutu	Hydro	4.8	Approved	RfP 3				
Nkusi	Hydro	9.6	Approved (formerly in reserve)	RfP 3				
Nyamagasani I	Hydro	15	Approved	RfP 3				

*Confidential*

Project name	Technology	Capacity (MW)	Status in GET FiT	Selected in	PPA signed	Financial close	Construction started	Commissioned
Nyamagasani II	Hydro	5	Approved	RfP 3				
Achwa 3	Hydro	9.9	Reserve list	RfP 3				
Soroti	Solar PV	10	Approved	Solar RfP	✓	✓		
Tororo	Solar PV	10	Approved	Solar RfP				

Source: Data from GET FiT Secretariat, KfW. Data are current as of late April 2016.

Note: Some projects have begun construction before financial close, so they are financing work through their own equity.

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## 5.2 EQ1a: To what extent has GET FiT addressed the barriers to private sector investment in RE projects in Uganda?

GET FiT's five interventions were each designed to address a particular barrier to investment in RE in Uganda. The barriers, and how GET FiT was designed to overcome them, are described in Table 5.2. The Theory of Change posited that by removing all these barriers, GET FiT would significantly increase investment in RE in Uganda. This subsection examines whether GET FiT is indeed removing those barriers.

**Table 5.2: Barriers and Interventions**

Barrier	Intervention	How Intervention Works
<b>Tariffs</b> were not high enough to provide investors with sufficient returns	Premium payment	The top-up makes investors more likely to invest by increasing returns. The top-up to the existing feed-in tariff (1) makes the difference between projects being financially viable or not, and (2) is certain enough to be relied on by investors.
<b>Transaction costs</b> , especially the cost of negotiating and drafting Power Purchase Agreements were too high	Standardized PPA and other legal documents	The standard documents make investors more likely to invest by lowering transaction costs. The standard documents provide legal certainty with a robust contractual basis for commercial arrangements. Also, standard documents reduce transaction costs for investors by reducing costs related to contract preparation (especially lawyers' fees).
<b>Regulatory risk</b> was too high, especially for obtaining licenses for RE generation	Capacity building for ERA <sup>44</sup>	Capacity building for ERA makes investors more likely to invest by reducing regulatory risk. Increased capacity at ERA increases the regulator's awareness of the impacts of regulatory change on the investment environment, and improves certainty of licensing and regulation processes.
<b>Offtaker risk</b> (not being paid for power) and political risk (government action changing returns on investment) were prohibitively high	Partial Risk Guarantees (PRGs)	PRGs make investors more likely to invest by reducing offtaker risk. Offtaker risk is addressed by the provision of guarantees, which compensate investors in the case of nonpayment by the offtaker. It is possible that just offering guarantees may reduce investors' risk perception, even though the PRGs were not used by investors.

<sup>44</sup> Given that the original M&E Framework repeatedly discusses "increased capacity of ERA", we think it makes the most sense to refer to this intervention as capacity building rather than technical assistance.

Barrier	Intervention	How Intervention Works
<b>Deemed power risk</b> , which occurs when generators have to be paid for power that they could have generated, but did not, due to inability to evacuate power to the grid	Interconnection component	The interconnection component makes UETCL more likely to sign PPAs because the likelihood of deemed energy is reduced. <sup>45</sup> It also improves outcomes for the public and the environment by reducing the risk of deemed power payments being required, and ensuring that renewably generated power can be used.

We did not find other barriers in the course of work. Interviewees were asked if they received support from other policy programs. This could have pointed to the existence of other barriers, if those programs were aimed at other barriers, and the interviewees thought the other support was necessary. However, this was not the case. Two projects received grants for project preparation, and otherwise no support outside GET FiT was provided.

The findings presented are based on desk reviews and stakeholder interviews. To mitigate the risk of bias, interviewees' responses were triangulated against other stakeholder groups, and expected biases acknowledged and built into the analytical process. Whilst not conclusive, every one of the 17 projects seemed to face at least one barrier that probably would have stopped it from attracting investment, but that GET FiT helped the project to overcome.

Therefore, our confidence in the hypothesis that GET FiT was necessary for each of the 17 projects in the GET FiT portfolio is increased. It follows from this that, as these projects come online (as one already as), GET can be considered to have contributed to the investment in the plants, and whatever benefits flow from the plants.

That said, not all interventions were needed by all projects. The following sections describe each intervention, and how important each one was for various types of projects and stakeholders (developers, equity investors, and lenders).

### 5.2.1 Premium payment

The causal pathway through which premium payments were expected to encourage investment is shown in Figure 5.2. The underlying assumption was that REFiT tariffs in Uganda are not high enough for many projects to earn a commercial return on equity invested, and to meet the lenders' financial requirements. As a result, equity investors will not invest, and lenders will not lend, and so project developers will not develop their projects. By providing an additional revenue stream, the premium payments aim to overcome this barrier.

<sup>45</sup> Deemed energy occurs when electricity could have been produced by a power plant, but was not, due to grid constraints.

Figure 5.2: Causal Pathway for Premium Payment

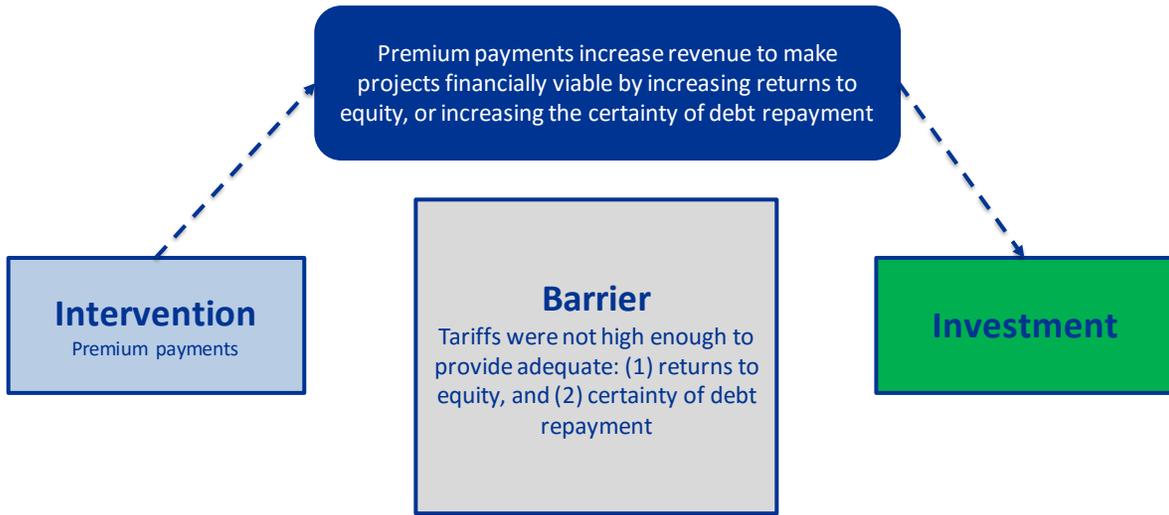


Table 5.3 shows the payments that various types of projects get from the REFiT, including the REFiT tariff and the premium payment from GET FiT.

**Table 5.3: ‘Total Effective Tariff’ for Hydropower and Bagasse project under GET FiT**

Technology	Capacity	Payment Type	Payment (US\$ per KWh)		
			RfP 1	RfP 2	RfP 3
<b>Hydropower</b>	Greater than or equal to 1MW, less than 9MW	Total effective tariff	\$0.093 to \$0.129	\$0.093 to \$0.129	\$0.099 to \$0.129
		REFiT	\$0.073 to \$0.109	\$0.079 to \$0.115	\$0.085 to \$0.115
		Premium	\$0.020	\$0.014	\$0.014
	Greater than or equal to 9MW, less than or equal to 20MW	Total effective tariff	\$0.093	\$0.099	\$0.099
		REFiT	\$0.073	\$0.085	\$0.085
		Premium	\$0.020	\$0.014	\$0.014
<b>Bagasse</b>	1MW to 20MW, inclusive	Total effective tariff	\$0.091	\$0.091	\$0.100
		REFiT	\$0.081	\$0.081	\$0.095
		Premium	\$0.010	\$0.010	\$0.05

Source: GET FiT bid documents.

Note: Biomass is not discussed here since no biomass projects have support from GET FiT at this time.

Four projects have secured financing (reached financial close), and six other projects have signed power purchase agreements (and thus on the way to financial close). This indicates that the REFIT combined with the GET FiT premium provided adequate revenue to attract finance, and to make it worthwhile developing project.

While this evidence is consistent with the hypothesis that the premium was needed to overcome the barrier to investment posed by inadequate REFIT tariffs, it is also consistent with an alternative hypothesis that the REFIT tariff was in fact adequate, and premium is just boosting returns to project developers.

Interviews with participants tended to support the hypothesis that the premium was needed to overcome the barrier. We interviewed the lenders for 13 of the 17 projects<sup>46</sup>. These lenders all indicated that they would probably not have financed the projects had the premium not been there. Developers for 10 of the projects also stated that the premium payment was necessary. This evidence is not conclusive; these developers and lenders may have stated that the premium was necessary even it was not.

The developer of one project said the premium was unnecessary. However, this statement does not necessarily contradict the hypothesis that the premium was generally necessary. This particular developer indicated he was willing to accept lower returns to do good for the world by producing clean power. The lender for this project indicated that it would not have lent if the premium was not there, providing support for the view that premium was in fact necessary to allow this project to proceed.

Evidence for the alternative hypothesis seems to be provided by the fact that some RE projects in Uganda are attracting investment without premium payments from GET FiT. Two hydropower project that were unsuccessful in their applications for GET FiT support are going ahead anyway. The premium was clearly not necessary for these projects to proceed. However, these projects seem to be special cases. The developer of one emphasized its “amazing hydrology”. The other project had a site which allowed a very compact layout, reducing costs.

More typical are the cases of two other developers who are continuing to develop projects without GET FiT support, but who consider their projects only marginally viable without the premium. Some projects being marginally viable without special circumstances is consistent with the premium payment generally being required.<sup>47</sup>

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<sup>46</sup> We did not interview lenders for four projects. One had a DFI lender, with which an interview could not be scheduled. Two of those four projects had commercial lenders—one could not be interviewed due to confidentiality concerns, and the other could not be reached in time to inform the report. The other project did not have a lender (only equity financing).

<b>Key findings:</b>	
<b>Finding</b>	<b>How and Why</b>
DFI lenders required premium payments to make loans	The premium payments were required to enable projects to meet financial covenants in their loan agreements. <sup>48</sup> If the projects could not meet the financial covenants, lenders would not have provided the loans, and the projects could not have been built.
Developers with particularly good project economics may not require premium payments	<ul style="list-style-type: none"> <li>▪ If a project has lower costs than is typical, it will require less revenue to be profitable. Such a project such a project could receive adequate return on equity from the REFIT tariff alone.</li> <li>▪ A good site could reduce costs per kWh, and so allow a developer to achieve the desired return on equity from the REFIT tariff alone.</li> <li>▪ A developer motivated to do good for the world by producing clean energy could require a lower return on equity than a typical developer. Such a developer could receive adequate return on equity with REFIT alone.</li> </ul>
Developers with more typical project economics likely do require premium payments	These developers require the premium payments to collect adequate revenue to provide an attractive return on equity. Without the premium payments, the projects would not have been viable, and thus would not proceed.

**Attribution:**

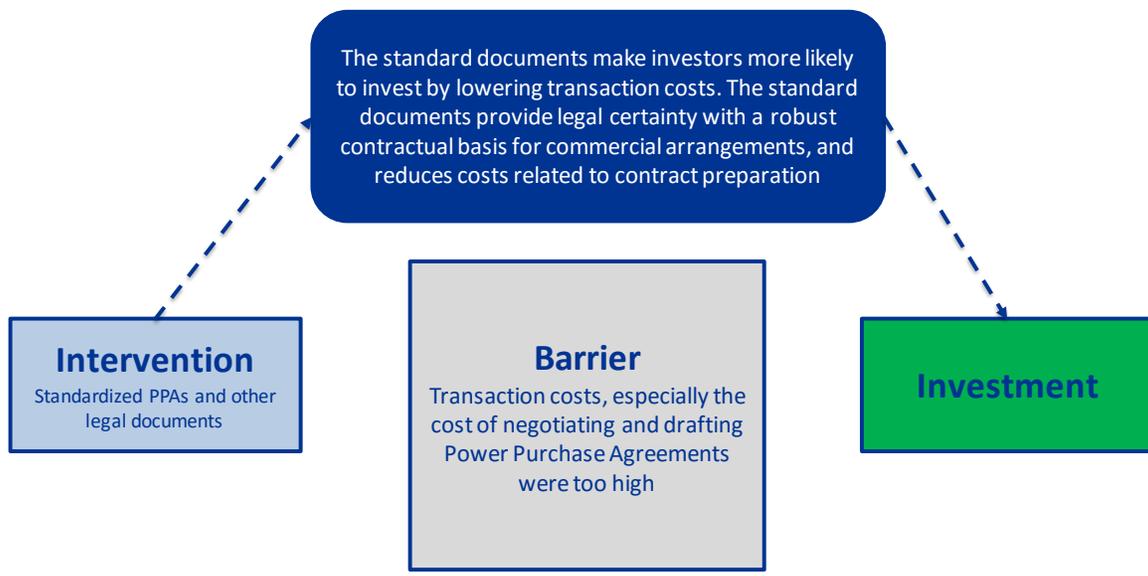
The premium payment was likely necessary for all 17 projects in the GET FiT portfolio to be realized. For the 12 projects that have loans from a DFI, the premium payment was necessary for loans to be made (this includes the project whose developer has strong social motivations). For the four projects that have commercial lending, it is likely that the premium would have been required—commercial lenders would actually be expected to impose tougher financial requirements on borrowers than would DFIs. One project had no lending, but its two financing sources (the developer and equity investor) both said the premium payment was necessary.

<sup>48</sup> Financial covenants include things like DSCR requirements (debt service coverage ratio). DSCR aims to ensure that a borrow has enough operating profit to repay lenders, and have a buffer of revenue above what is required for debt repayment. See <http://www.investopedia.com/terms/d/dscr.asp>

### 5.2.2 Standardized PPAs and other legal documents

The causal pathway through which standardized PPAs and other legal documents were expected to encourage investment is shown in Figure 5.3. Developers and lenders need clear contracts that allocate risks well. Negotiating PPAs and agreements can involve significant legal costs, and take time. The standardized documents aim to overcome this barrier by reducing transaction costs.

**Figure 5.3: Causal Pathway for Standardized PPAs and Other Legal Documents**



Of the five lenders we interviewed, all but one indicated that the standardized documents were necessary for their loans. These lenders are financing 12 projects. While not conclusive, these statements support the hypothesis that transaction costs were a barrier to projects attracting finance, and that the standard documents removed this barrier for 12 projects.

One lender said it could probably have made a loan without the standardized documents, as it could have probably helped the developer negotiate a bankable contract. The developer in question had previously negotiated a successful PPA in Uganda. However, the lender said that having the standard documents made the transaction easier, and so increased its likelihood.

Five developers thought the standard PPAs were necessary. These include four highly experienced RE developers, and a developer who has never worked with IPPs or RE.

On the other hand, developers for seven projects said the standard documents were not needed for their projects. All but one of these developers already had active PPAs in Uganda. The other had in-house lawyers who it claimed could have prepared the necessary documents.

The evidence suggests that the standardized documents were required by at least one key stakeholder for 13 projects (key stakeholders being developers, equity investors, and lenders). Standardized documents were especially important for lenders, and for developers that did not already have active PPAs in Uganda. The PPAs were beneficial by saving time and money in preparing the transaction (reducing transaction costs).

Many stakeholders with projects supported by GET FiT said the documents were of a high quality. Six developers praised the quality of the documents, saying that the documents were

well balanced; better than other PPAs they have signed in Uganda; and better than PPAs they have signed in Sri Lanka and Tanzania. Similarly, three lenders praised the quality of the documents, saying that the PPA did not require deep review or negotiation; had the quality that would be expected for a 500MW in a far wealthier country; and was professionally done and focused on bankers' needs. One unsuccessful bidder said the standard documents were better than those in most jurisdictions with which it was familiar.

Berkeley Energy recently signed two PPAs that were based on the GET FiT PPA, but used for projects outside GET FiT (Achwa I and II). Also, two developers are trying to use the GET FiT PPAs for projects outside the program. This implies that the GET FiT PPAs may be enabling transformational change by improving the general investment environment for RE projects outside GET FiT. This indicates that GET FiT has potential for transformational change, which is discussed in more detail in Appendix E.2.

<b>Key findings:</b>	
<b>Finding</b>	<b>How and Why</b>
Standardized documents are especially important for lenders	<ul style="list-style-type: none"> <li>▪ Legal due diligence (review of contracts) is a major concern for lenders. Standardized documents reduce the time or cost of legal due diligence, as compared to negotiating one-off contracts.</li> </ul>
Standardized documents may not be required for developers who have strong human resources for contract negotiation	<ul style="list-style-type: none"> <li>▪ Strong human resources reduce spending on legal fees (for the case of having a large and experienced team of development professionals), or eliminate spending on outside legal fees (in the case of having in-house lawyers)</li> </ul>
Standardized documents are important for developers who do not already have an active PPA in Uganda	<ul style="list-style-type: none"> <li>▪ Standardized documents significantly reduce the time and cost of negotiating contracts for developers who are new to the market. This is often true even for developers who have significant experience elsewhere.</li> </ul>

**Attribution:**

The standardized documents were likely necessary for 13 of 17 projects in the GET FiT portfolio. One project did not require the standardized documents because it has a highly experienced developer with strong human resources, and no lender. Another project likely did not require the standardized documents because its developer has a strong in-house legal team. One project did not require the standardized documents because its developer has an active PPA in Uganda, and its lender felt it could manage without the standardized documents. Another project’s developer said it did not require the standardized documents and has an existing PPA.

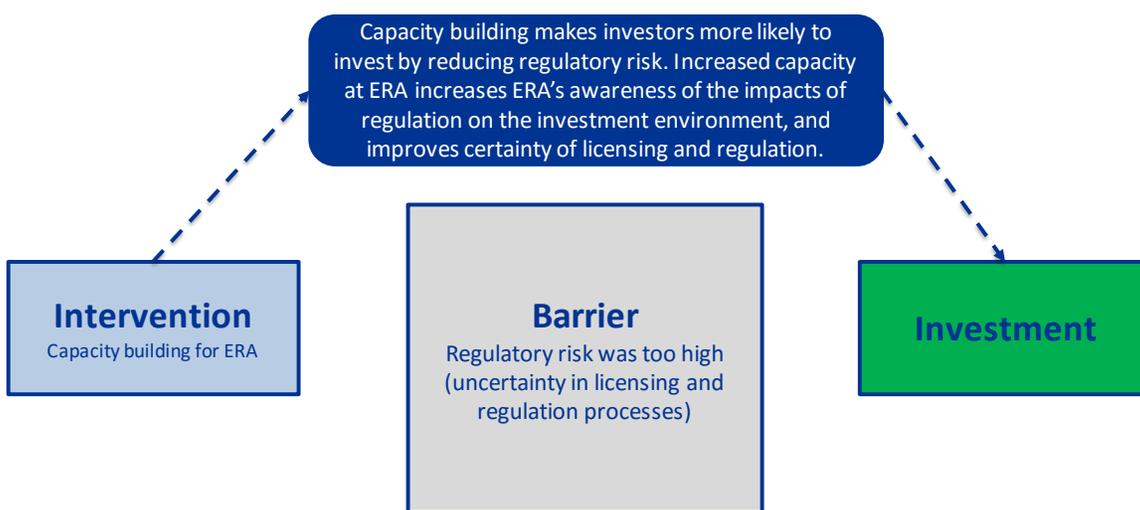
### 5.2.3 Capacity building for ERA

The causal pathway through which capacity building for ERA was expected to encourage investment is shown in Figure 5.4. The hypothesis was that low capacity at ERA could reduce the speed, certainty, or predictability of licensing and regulatory processes, and create significant delays for RE projects, which could be a barrier to investment. By improving ERA’s ability to execute important functions, the capacity building should help overcome that barrier.

The focus areas for capacity building are:

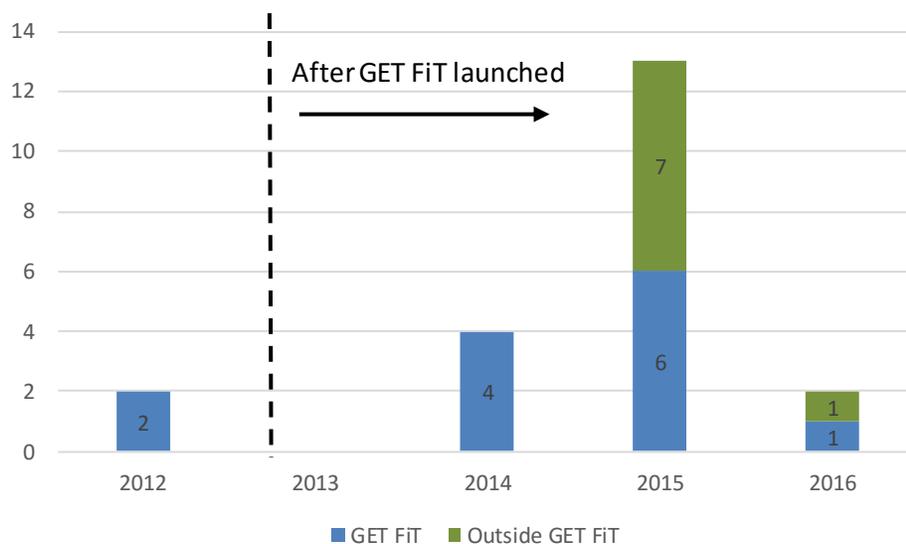
- Project due diligence
- Tariff modelling
- Oversight of interconnection and wheeling and compliance monitoring of distribution.

**Figure 5.4: Casual Pathway for Capacity Building for ERA**



ERA has approved more licences since GET FiT began than before. From 2013 until now, ERA has issued 19 licenses, of which 10 were for GET FiT projects. This includes 13 licenses in 2015 alone. In 2012, ERA only issued two licenses, and none in 2013. This trend in licensing is shown in Figure 5.5. This evidence is consistent with the hypothesis that the capacity building component did help ERA increase capacity and so process licenses efficiently. An alternative hypothesis is that ERA already had adequate capacity to process licenses. The evidence on the rate of approving licenses does not exclude this hypothesis. It is possible that the ERA had capacity but did not approve many licenses because it received few applications, or because it correctly rejected those applications it received, or both. Testing this alternative requires a full time series of license applications each year, and whether each was approved or rejected. ERA does not publish this information. We have asked ERA for the data, and expect to receive it in time to incorporate this analysis in the next report.

**Figure 5.5: Issuance of Generation Licenses in Uganda, All Technologies and Installed Capacities**



Source: ERA. The data for 2016 only run through April.

Support for the hypothesis that GET FiT did build ERA’s capacity is provided by ERA staff members, who reported that the capacity building helped ERA license projects quickly.

The Chief Executive of ERA said the capacity building for due diligence of hydropower projects was particularly beneficial, and helped increase transparency. Ziria Tibalwa, ERA’s Director of Technical Regulation, said that the capacity building for due diligence

*“has not only enhanced our internal capacity to review permits and license application, but has increased ERA’s visibility nationally, regionally and internationally, helped us to review and amend the permit and license application forms and instruments, helped ERA to develop and operationalize the license monitoring framework for projects at permit, license, construction and operational stage for the common technologies including hydro, solar, biomass and bagasse, and helped to review the permit and license terms and conditions to make them relevant and adequate”.*

Ms. Tibalwa also said that without the capacity building, it would have been challenging to bring ERA to its current capacity. It probably would have taken “some years to be where we are now”. She also said that the capacity building has made the licensing system “more effective, proactive, and faster”. It has also greatly improved communications with developers through the Renewable Energy Development Guide that was prepared under the capacity building.

Geoffrey Okoboi, ERA’s Director of Economic Regulation, said that learning and templates from the capacity building on tariff modelling has already been applied in financial analysis for licensing. This has made licensing reviews faster than in the past. He also said that the tariff benchmark database provided could be improved—it should have more data on other countries in Africa and elsewhere, to allow for regional and international comparisons.

Developers' opinions of ERA's capacity are generally consistent with ERA's capacity having improved. Of the six developers who had an opinion on how ERA's capacity has changed over time, five said it has improved. One said capacity has remained the same. No developer said capacity has declined. All nine developers who gave an opinion of ERA's current capacity had a positive outlook, although some areas for improvement were pointed out.<sup>49</sup>

Much of the quality of ERA's tariff modelling and regulation of interconnection—and thus the benefits of the related capacity building—are likely to be observed in the future. The tariff modelling TA ended in February 2016. This TA should impact future opinions of Uganda as a desirable market for investment in electricity. As of late April 2016, the TA for regulation of interconnection has not yet begun. This TA includes development of an interconnection code, and capacity building on monitoring of compliance with interconnection rules by distribution companies.

**Key finding:** GET FiT's capacity building on project due diligence likely helped ERA to process licenses quickly enough to avoid being a barrier to investment.

**Attribution:** The evidence shows that licensing has not been a barrier to investment in renewable generation, and that GET FiT likely increased ERA's capacity to process licenses effectively. However, until the alternative hypothesis that ERA already had the requisite capacity is excluded it is premature to draw conclusions on attribution for this component.

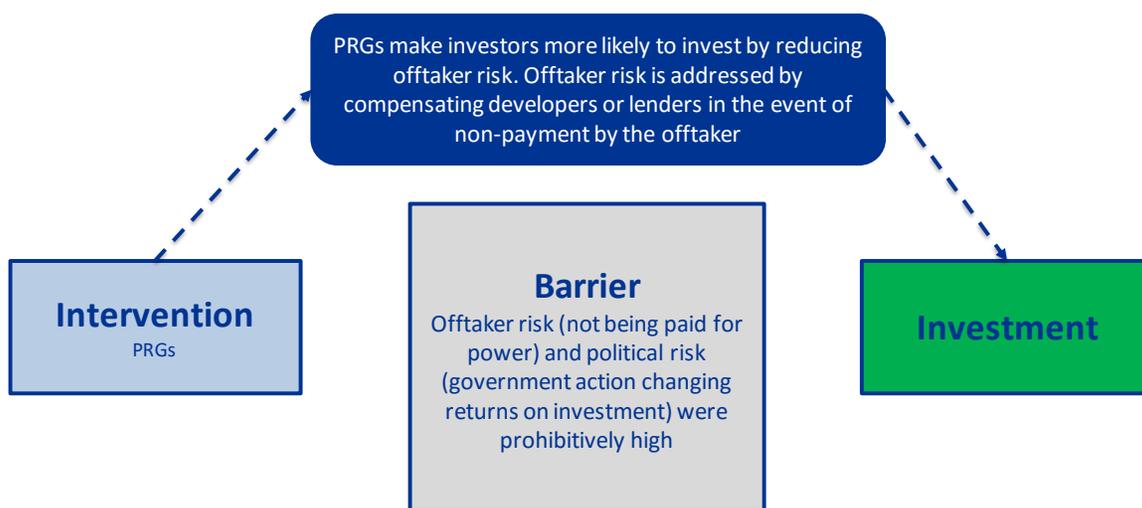
#### **5.2.4 Partial Risk Guarantees**

The causal pathway through which Partial Risk Guarantees (PRGs) were expected to encourage investment is shown in Figure 5.6. The risk that UETCL (the offtaker) would end up not paying for power could be perceived as high by investors, and thus be a barrier to investment. By compensating investors in the case of nonpayment by UETCL, PRGs should overcome that barrier.

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<sup>49</sup>The responses are presented in more detail in Appendix A.1. Developers were asked their opinions of each capacity building intervention offered by ERA, but they were largely unaware of those interventions. The developers' opinions on the intervention itself were excluded from the analysis, since the likelihood of a developer having a direct understanding of the quality of training given to ERA staff is very low.

Figure 5.6: Causal Pathway for PRGs



No project in GET FiT has applied for a PRG. PRGs can only be used to support lending that is (1) given by a commercial bank, and (2) in the form of project financing, rather than corporate financing.<sup>50</sup>

Only two GET FiT-supported met these conditions for PRGs. The other 15 were not eligible, as they did not have project financing from commercial banks. Most of these had project financing from DFIs rather than commercial banks, while some did not have project-specific financing (instead being financed from the balance sheet of the sponsoring company).

The commercial bank financing the two projects that were eligible for PRGs did want risk mitigation of the sort provided by a PRG. However, rather than applying for a PRG, it plans to take out a political risk insurance policy from ATI (Africa Trade Insurance) for the two projects. The developer of those projects said insurance from ATI was preferable to a PRG because ATI is “much more nimble” than the World Bank.

<b>Key findings:</b>	
<b>Finding</b>	<b>How and Why</b>
PRGs were not used largely because lending to GET FiT-supported projects was not eligible for coverage	Loans are only eligible for PRGs if they are: <ul style="list-style-type: none"> <li>▪ Made by a private entity (not a DFI)</li> <li>▪ In the form of project financing, rather than corporate financing</li> </ul>
Projects that are eligible for PRG coverage may opt for less cumbersome alternatives	PRGs were considered too cumbersome, so an alternative risk mitigation instrument was used by the one lender that was eligible for a PRG (political risk insurance)

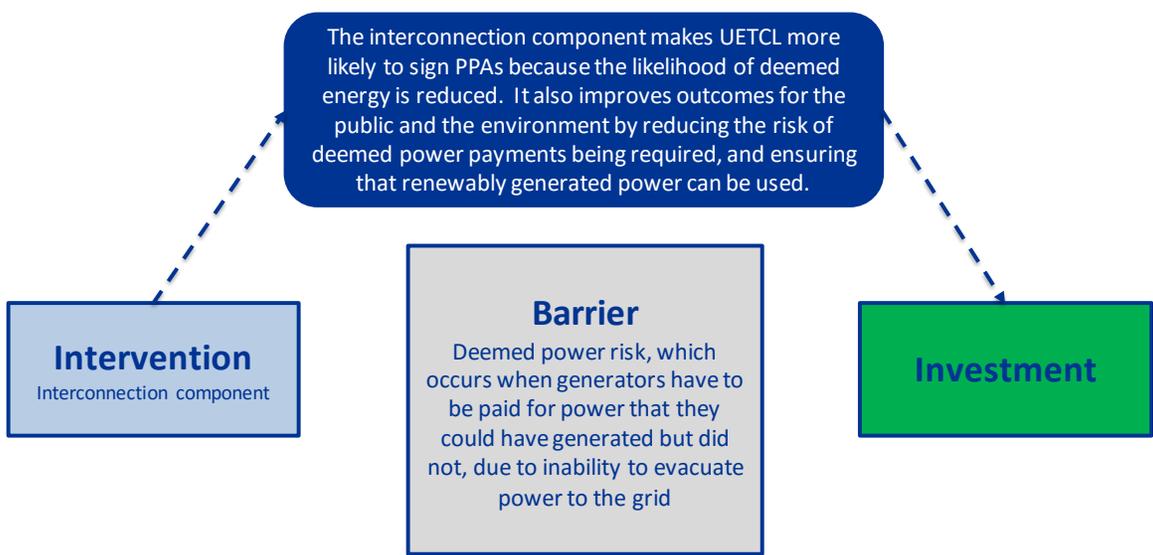
<sup>50</sup> Corporate financing means giving a loan based on the strength of a borrower’s general finances. This contrasts with project financing, which means giving a loan to one project based on the strength of that project alone. Two developers used corporate financing for two projects (one project each). As the PRG is country-specific and sector-specific, the PRG could not be used for those corporate financings. One developer had corporate financing based on the overall strength of a business active in sectors outside of electricity. The other developer had corporate financing based on the overall strength of a business with a portfolio of power projects outside Uganda.

**Attribution:** No projects in the GET FiT portfolio required PRGs. All projects are proceeding without PRGs.

### 5.2.5 Interconnection component

The causal pathway through which the interconnection component was expected to encourage investment is shown in Figure 5.7. If the electricity grid does not have enough capacity to move power from where it is produced to where it is consumed, power plants may not be able to produce as much power as they should, leading to a barrier to investment. Inability to transport power would also reduce benefits from the plants producing the power. By supporting grid reinforcement to allow power to flow freely across the grid, the interconnection component aims to overcome that barrier.

**Figure 5.7: Causal Pathway for Interconnection Component**



The interconnection support provided is not to connect the plant to the grid (shallow connection) but to allow power from GET FiT power plants to flow across part of the existing grid that would otherwise be constrained (deep interconnection). The need for interconnection support was identified by the Joint Interconnection Task Force (JITF).<sup>51</sup> The JITF is chaired by ERA, and includes technical experts from ERA, UETCL, REA, and Umeme. Following the recommendations of the JITF study, DFID’s business case for funding the interconnection component identifies a number of plants at risk of not being to supply power due to inadequate grid capacity. This is based on the JITF’s technical analysis.<sup>52</sup>

The interconnection works funded by GET FiT were deemed critical by the JITF for five projects to evacuate power (Ndugutu, Nyamagasani I, Nyamagasani II, Sindila, and Soroti):

- Reinforcement of the 33kV grid in Western Uganda (US\$13 million)

<sup>51</sup> GET FiT Annual Report 2015

<sup>52</sup> These power plants are shown in Appendix H.6

- Upgrading the Opuyo substation in Eastern Uganda (US\$5.8 million)

GET FiT coordinated with other donors to ensure that other works were funded that were deemed critical by JITF for five other projects (Kyambura, Lubilia, Nyamwamba, Rwimi, and Siti II):

- Extension of the Mbale-Bulambuli 132kV transmission line (up to EUR40 million, funded by the Government of Germany)
- Upgrading the Nkenda substation (cost unknown, to be funded by the World Bank).

An alternative hypothesis is that the interconnection works were not in fact needed; power could have flowed across the grid with constraint in any event. To test this alternative hypothesis, an independent electrical engineer reviewed the JITF's technical report ("Power Evacuation and Interconnection Study for the GET FiT Projects", January 2015). The engineer found that the JITF report was sound, and concluded that the works are likely necessary to allow for evacuation of power over the longer term.

A further alternative hypothesis is that, even if the works were needed, they could have been financed by UETCL, and therefore GET FiT financial support was not needed. Interviews with UETCL managers contradicted this hypothesis. Managers pointed out that UETCL relies on funds from the national government to fund works. UETCL's strategic investments are largely funded by donors via the GoU. It is likely that the interconnection works did require donor finance.

Interviews with UETCL also indicate that the interconnection works were likely needed for UETCL to continue signing PPAs. Three UETCL staff who lead the organization's relationship with GET FiT indicated that, without GET FiT's support for interconnection, UETCL would not sign more than the 10 PPAs that had been signed by November 2015. The interconnection infrastructure (either funded by GET FiT or coordinated by GET FiT) was required to minimize the risk of deemed power obligations.

The deemed power issue arises from terms in the GET FiT PPAs. In the event that a power plant cannot generate and supply load because of grid congestion, the PPA provides that the GoU has to pay the plant *as though* it had supplied power (even though it did not). This provision in the PPA protects the investor in the event that grid problems stop it from supplying power. The risk of grid congestion is transferred to the GoU through the obligation to pay for deemed power. It is likely that UETCL's desire to limit this risk to government led it to adopt the position that it would not sign PPAs with power plants in locations that would likely be effected by grid congestion, and therefore get paid for power they did not supply.

GET FiT is also providing capacity building to ERA on interconnection. As this capacity building has not yet begun, it is too early to comment on its effects.

**Key findings:** The interconnection works called for in the JITF report were likely needed to allow 10 power plants to evacuate power in the future.

**Attribution:** GET FiT's interconnection support, whether through direct funding of works, or coordination of funding of works by other donors, was likely necessary for 10 projects. Without interconnection support, these projects probably would not be able to evacuate power in the future, meaning UETCL would probably have not signed PPAs for those plants, and if it had, the full benefits of the plants would not have been realized because some of the output could not be used.

### **5.2.6 Summary of attribution**

The importance of GET FIT's five interventions is shown in Table 5.4.

Table 5.4: Importance of GET FiT's Interventions, by Project

Project	GET FiT was necessary	Number of interventions required	Premium payment	Standardized documents	Partial risk guarantees	Interconnection component
Project 1	✓	1	✓	U	U	
Project 2	✓	1	✓	U	U	
Project 3	✓	2	✓	U	U	✓
Project 4	✓	3	✓	✓	U	✓
Project 5	✓	2	✓	✓	U	
Project 6	✓	3	✓	✓	U	✓
Project 7	✓	2	✓	✓	U	
Project 8	✓	3	✓	✓	U	✓
Project 9	✓	3	✓	✓	U	✓
Project 10	✓	3	✓	✓	U	✓
Project 11	✓	2	✓	U	U	✓
Project 12	✓	3	✓	✓	U	✓
Project 13	✓	2	✓	✓	U	
Project 14	✓	3	✓	✓	U	✓
Project 15	✓	3	✓	✓	U	✓
Project 16	✓	2	✓	✓	U	
Project 17	✓	2	✓	✓	U	
<b>Total</b>	<b>17</b>	<b>-</b>	<b>17</b>	<b>13</b>	<b>0</b>	<b>10</b>

Key: “✓” = necessary, “U” = unnecessary

Note: Capacity building is not shown here because it could not be linked to individual projects in a meaningful way. There are blank cells in the interconnection column because those projects were not identified as needing interconnection support. It is good that interconnection works were not provided for those projects.

As illustrated in Table 5.4, the analysis has shown that all 17 projects likely needed GET FiT support, in the sense that they could not proceed without the support provided by at least one GET FiT intervention. (A “✓” in the table indicates that the intervention shown in the column heading was necessary for that project to proceed.)

In fact, most of the projects needed support from multiple GET FiT interventions:<sup>53</sup>

- Eight projects required three interventions
- Seven projects required two interventions
- To projects required one intervention (in each case, the premium payment).

Looking at the contribution from each intervention indicated that:

- The premium payment was likely necessary for all 17 projects
- The standardized documents were likely necessary for 13 of the projects
- Interconnection support was likely necessary for all 10 projects for it was provided.
- Capacity building may well have made a contribution, but the evidence is not yet adequate to draw a conclusion on attribution
- The PRG was not needed at all.

The fact that most projects required multiple interventions, and that the TA seems beneficial, indicates that GET FiT did well in providing a wide range of interventions targeted at different barriers. It seems that GET FiT targeted the important barriers well, although payment risk was surmounted without direct support from GET FiT.

The question on whether GET FiT was sufficient for the projects in GET FiT’s portfolio to go ahead depends on the definition of sufficiency. As mentioned in Section 3.2, Uganda had contextual factors that helped the projects go ahead (reliable contract enforcement, and so forth). Also, Project 4 and Project 12 received support from donor-funded grants for project preparation works. If ‘sufficient’ is taken to mean that, given GET FiT, the project would have gone ahead regardless of the enabling legal and policy environment, electricity sector arrangements and resource availability, then GET FiT was not sufficient to make these projects happen. At least some other factors were also necessary.

**Key findings:** GET FiT did well in offering a range of interventions targeted at different barriers to investment. With the exception of PRGs, the interventions were often necessary to bring about investments, and 15 out of 17 projects required multiple interventions. Although capacity building cannot be directly linked to individual projects, the GET FiT portfolio would likely be smaller without capacity building.

**Attribution:** All 17 projects in the GET FiT portfolio can be attributed to the program. One or more interventions from GET FiT were likely necessary for all 17 projects to be realized.

### **5.3 EQ1b: What proportion of the change in investment in RE occurred as a result of GET FiT?**

Thus far, GET FiT has brought about one realized investment—the Kakira bagasse power plant (20MW). An investment is considered realized when a plant reaches COD. COD is an

<sup>53</sup> This count includes the four interventions that could be analytically linked to individual projects (all but capacity building)

objective measure of when an investment is fully realized, as it is the day that a power plant begins its commercial relationship with the offtaker (starts selling power). Other GET FiT power plants are expected to reach COD in the future, and will be analyzed in the next two reports in this engagement.

Table 5.5 shows the history of investment in RE from 2006 to present, and what part of this is attributable to GET FiT. Power plants that are supported by GET FiT, and attributable to the program, are highlighted in green.

Table 5.5: Change in Investment Due to GET FiT

Plant	Supported by GET FiT	Attributable to GET FiT	Year of COD	Installed capacity (MW)	Technology	Size	Cost	o/w Public	o/w Private
Kakira (pre-GET FiT)			2006	52	Bagasse	large	\$28,200,000	\$3,300,000	\$24,900,000
Mubuku III (Kasese Cobalt Co. Ltd.)			2008	10.5	Hydro, small	small	\$27,500,000	-	\$27,500,000
Mubuku II/ Bugoye			2009	13	Hydro, small	small	\$65,700,000	\$8,900,000	\$56,800,000
Mpanga			2011	18	Hydro, small	small	\$27,000,000	\$13,000,000	\$14,000,000
Ishasha/Kanungu			2011	6.5	Hydro, small	small	\$14,000,000	\$0	\$14,000,000
Kinyara			2011	7.5	Bagasse	small	\$12,675,000	-	\$12,675,000
Bujagali			2012	250	Hydro, large	large	\$798,000,000	\$532,000,000	\$266,000,000
<b>GET FiT is launched in 2013</b>									
Buseruka (Hydromax)			2013	9	Hydro, small	small	\$16,318,452	\$5,471,890	\$10,846,501
Kakira (GET FiT)	✓	✓	2015	20	Bagasse	small	\$56,775,000	\$0	\$56,775,000

Note: Investments are included in the time series when a power plants is commissioned (reaches COD).

Two RE projects have reached COD since 2013. Kakira was supported by GET FiT, and attributable to the program. Buseruka was largely developed before GET FiT launched in 2013, and is not supported by the program<sup>54</sup>. Kakira provided 20MW of RE, or 69 percent of the MW of RE added since GET FiT began. Kakira provided 78 percent of total investment and 84 percent of private investment since 2013 (in US Dollar terms). It had no public investment.

### 5.3.1 PRQ1a: What was the level of attribution of change to each of the donors of the program?

This question aims to apportion the results in the logframe across GET FiT’s donors. The full logframe is shown in Section 4. Since only one power plant is operational so far, this section serves to show how results will be attributed to donors in the future. This question will be revisited in the next two reports in this engagement.

This analysis aims to measure the change in RE investment attributable to GET FiT, and the effects clearly resulting from it. Results are attributed to GET FiT through projects. All projects in the GET FiT portfolio have been attributed to the program (see Section 5.2). Then, all results are attributable to GET FiT.

The United Kingdom’s ICF Methodology<sup>55</sup> provides a clear approach for this. Results should be apportioned across donors by their relative contribution to program funding. Then, if one donor contributed 20 percent of program funding, that donor would “receive” 20 percent of jobs whose creation are attributable to the program. The donors’ funding commitments, and their relative proportions, are shown in Table 5.6.

**Table 5.6: Donor Funding Commitments in Euro (without Interconnection)**

Donor	Euros	Percent of total
<i>DECC</i>	<i>28,900,000</i>	31%
<i>DFID</i>	<i>14,100,000</i>	15%
<b>United Kingdom</b>	<b>43,000,000</b>	<b>46%</b>
<b>European Union</b>	<b>20,000,000</b>	<b>21%</b>
<b>Norway</b>	<b>15,900,000</b>	<b>17%</b>
<i>BMZ</i>	<i>15,000,000</i>	16%
<i>BMU</i>	<i>500,000</i>	1%
<b>Germany</b>	<b>15,500,000</b>	<b>16%</b>
<b>TOTAL</b>	<b>94,400,000</b>	<b>100%</b>

Source: GET FiT Annual Report 2015

Note: The UK contribution to interconnection is not included here, since it is separate from the main GET FiT funding allocation.

<sup>54</sup> Buseruka’s PPA was signed in 2012 according to an interview with the developer, Hydromax. Hydromax also has a project in GET FiT.

<sup>55</sup> DECC provided guidance documents on calculating key performance indicators (KPIs) for the International Climate Fund (ICF) ICF

Table 5.7 shows the attribution of results from the logframe to GET FiT's donors. Table 5.7 only includes Outputs and Outcomes that can be reasonably counted, and thus divided across donors. For example, it is not meaningful to divide "Number of technologies supported by GET FiT" across the donors. This would say that Norway provided 17 percent of three technologies, or 0.5 technologies. Supporting 0.5 technologies has no analytical meaning. However, it does make sense to divide "Power delivered to national grid" across donors. Power is easily counted in terms of GWh. Then, Norway would have provided 17 percent of 292GWh, or 49.2GWh.

Impacts will be divided across donors in the subsequent reports in this assignment, in 2017 and 2019.

**Table 5.7: Attribution of Change to Donors**

	Units	United Kingdom	European Union	Norway	Germany	Total
Donor's share of change	%	46%	21%	17%	16%	100%
<b>Outputs</b>						
Installed capacity (reached COD)	MW	9.1	4.2	3.4	3.3	20.0
Power delivered to national grid	GWh	66.5	30.9	24.6	24.0	146.0
Private finance mobilized for GET FiT (financial close)	US\$ million	26.0	12.1	9.6	9.4	57.0
Public finance mobilized for GET FiT (financial close)	US\$ million	-	-	-	-	-
<b>Outcomes</b>						
Number of direct national jobs created by power plants	#	556	258	205	200	1,220
Male	#	512	238	189	185	1,124
Female	#	43	20	16	15	94
Construction	#	288	134	106	104	632
O&M	#	5	2	2	2	11
Skilled	#	31	14	11	11	68
Not skilled	#	305	142	113	110	670

Source: Logframe form monitoring consultant, GET FiT Annual Report 2015, Castalia calculations.

Note: Data may not sum perfectly due to rounding.

## 6 Relevance

According to the OECD DAC Evaluation Criteria, ‘relevance’ refers to the extent to which an aid activity is suited to the priorities and policies of the target group, recipient and donor.<sup>56</sup> This section discusses how GET FiT aligns with Government of Uganda’s (GoU) objectives, as well as the extent to other programs are being implemented that could have led to the same outputs.

### 6.1 EQ5: Was GET FiT Relevant for Uganda?

GET FiT’s objective is to help Uganda pursue a climate resilient low-carbon development path resulting in growth, poverty reduction, and climate change mitigation. To test if this objective aligns with the government’s priorities and policies, this section reviews government policies concerning: increasing investment in RE; increasing private investment in renewable energy in particular; and reducing greenhouse emissions (GHG) from the electricity sector. Goals changed to some extent when Bujagali came on-line, and these changes are noted where relevant.

Increasing investment in RE was a clear policy priority before 2012. The development plan for 2010/2011 to 2014/2015 set a goal of building 150MW of small hydropower capacity. This included finishing the Buseruka, Mpanga, and Nyagak projects, which were then under construction.<sup>57</sup> We gathered from MEMD that, at this time, small hydropower projects were thought particularly desirable because they were expected to be quickly commissioned, and so to come online before the big Bujagali hydropower plant was commissioned.

New capacity was needed urgently because, before Bujagali came online, Uganda had to rely on expensive HFO-fired generators, and to shed load. The National Development Plan (NDP) for 2010/2011 to 2014/2015 said there was a

*“need for radical and drastic action to step up electricity supply to drive the economy to the indicators compared to middle income countries like Malaysia and Korea”<sup>58</sup>*

When Bujagali came on line in 2012, it resulted in a surplus of generation capacity. For this reason, the need for new small renewable plants was no longer urgent. However, adding renewable generation remained a policy objective, since electricity demand was expected to continue to grow strongly. The NDP for 2015/2016 to 2019/2020 again stated that the development of small hydropower projects was a priority.

Increasing private investment in generation has been an objective of the GoU since the electricity sector was unbundled in 2001, as MEMD confirmed. However, the GoU has put a greater priority on public investment in large renewable energy projects since Bujagali (which was privately financed) came on-line. The NDP for 2015/2016 to 2019/2020 did not make private investment in generation a goal. The GoU has moved ahead with the publicly-financed the Karuma and Isimba hydropower projects, which together are expected to add 783MW of capacity to the grid.

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<sup>56</sup> <http://www.oecd.org/dac/evaluation/daccriteriaforevaluatingdevelopmentassistance.htm>

<sup>57</sup> These projects are now operational. The developers of Buseruka (Hydromax) and Mpanga (SAEMS) have power plants in the GET FiT program. Nyagak is on WENRECOs grid in the West Nile region, which is isolated from UETCL’s grid.

<sup>58</sup> National Development Plan for 2010/2011 to 2014/2015

A recent study by Multiconsult noted that then these two plants come on line (in addition to the GET FiT supported projects) they would:

*“add some 780MW ...this sudden increase of about 50 percent in expected generation of electricity will almost surely create a significant power surplus in the system for at least a 5-year period even given the most ambitious demand growth scenarios. This does not yet consider the potential for exports (which have been negligible to date)”.*<sup>59</sup>

Concerning greenhouse gas emissions reduction, Uganda’s National Development Plans, acknowledged in 2010 “insufficient attention being given to climate change initiatives by the Government, the private sector, the civil society and at community levels”. However, Uganda has not made GHG emissions reduction a goal, either for the economy as a whole, or for the electricity sector in particular.

Considering all these factors, we conclude that, when GET FiT was designed, its focus on increasing private finance in small hydro plant was highly aligned with government priorities. However, as implementation started in 2012, the situation changed. Bujagali provided Uganda with adequate capacity, and made generation nearly 100 percent renewable. The GoU still wanted to add renewable generate to the grid to meet future demand, but started to put more effort into large scale publicly financed projects. After 2012, GET FiT’s goal was still in-line with the stated priority of adding small hydro-power plants. However, the need for these plants became less pressing. Their value to the economy will depend on the speed with which demand grows. GET FiT’s objective of increasing specifically private investment in a renewable power may be a valuable, but it is not something the government lists among its policy priorities. Low carbon growth is also not a stated priority of the GoU.

When designed, GET FiT was highly aligned with government priorities. As implementation started, the degree of alignment reduced, following the commissioning of the Bujagali dam and a shift in focus toward large publicly financed hydro-plants. However, GET FiT’s major achievement—enabling more small hydro-plants—remains in line with stated government priorities.

**Key findings:** When designed, GET FiT was highly aligned with government priorities. As implementation started, the degree of alignment reduced, following the commissioning of the Bujagali dam and a shift in focus toward large publicly financed hydro-plants. However, GET FiT’s major achievement—enabling more small hydro-plants—remains in line with stated government priorities.

## 6.2 PRQ3: What other programs are being implemented that could have led to the same outputs?

This question aims to assess whether GET FiT duplicated other programs working towards the same goals in Uganda. The other potentially over-lapping donor activities, the sectors they share with GET FiT, and any actual overlap with GET FiT’s outputs, are shown in Appendix D.

Four other donor programs are supporting small-scale RE generation. However, these projects provide outputs that are complementary to GET FiT, rather than duplicative:

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<sup>59</sup> “Uganda 10 Year Energy and Power Balance Projects”, draft report written by Multiconsult for Norfund.

- The AfDB's SREP Program supports the installation of RE generation capacity, and eventual production of power. It is unclear at this time what size these projects would be. It is possible they could be small-scale (under 20MW). This would depend on the findings of feasibility studies. SREP would not be able to help any projects in the GET FiT portfolio. SREP supports wind power (and geothermal at a scale too large for GET FiT). Wind projects are not supported by GET FiT.
- UECCC provides TA and advisory services for IPP projects, and even provided support for a project that was in GET FiT. The SAIL bagasse project received a grant from UECCC to help with E&S studies. However, even with the help of a grant, the project failed to meet GET FiT's E&S requirements, and lost its support from GET FiT. UECCC's interventions do not overlap with GET FiT's interventions. UECCC does not enhance tariffs, prepare standardized documents, provide capacity building for ERA, offer credit enhancements for IPPs, or support interconnection infrastructure. As shown by the experience of the SAIL project, UECCC provides support that is complimentary to GET FiT.
- The Muzizi hydropower project will provide 45MW of hydropower generation capacity. This does not directly overlap with GET FiT, because GET FiT only supports projects with 20MW of capacity or less.
- The Open Sector Program is supporting the construction of two small hydropower projects in the West Nile Region of Uganda (Nyagak I and III). These projects will connect to WENRECO's distribution grid, which is completely isolated from the national grid operated by UETCL. GET FiT only supports projects that connect to UETCL's grid.

While numerous donor-supported transmission programs being implemented in Uganda these do not overlap with GET FiT's interconnection works.

**Key findings:** GET FiT's outputs do not overlap with other programs.

## 7 Efficiency

According to the OECD DAC Evaluation Criteria, efficiency measures the results of a development intervention—qualitative and quantitative—in relation to its inputs.<sup>60</sup> Efficiency is an economic term which signifies that the aid achieves maximum value given the resources used. GET FiT's efficiency is discussed in terms of how appropriate GET FiT's program model was for the program's goals, and for Uganda. The relevant questions are:

- PRQ6: Was GET FiT an Appropriate Model to Deliver the Intended Outcomes?
- PRQ6a: Did the FiT tendering arrangements work and what lessons can be learnt from them?
- PRQ6b: Was the choice and arrangements with the implementation consultant appropriate (again lessons for the future)?

In subsequent reports, this question will be answered across more dimensions by comparing the value for money provided by different RE technologies. At this time, it is not possible to compare the benefits resulting from different technologies. Only one power plant is operational at this time, and that project employs only one technology (bagasse).

The questions that will be answered in subsequent reports are:

- EQ2: What Has Been the Level of Economic Benefit (to Uganda) of Different RE Technologies (Value for Money) Specifically Funded by GET FiT?
  - EQ2a: To what extent have the various GET FiT RE technologies led to an increase in jobs for Ugandan nationals?
  - EQ2b: To what extent have the various GET FiT RE technologies led to an increase in economic benefit for Uganda?
  - EQ2c: Which GET FiT RE technologies have provided better value for money? What have been the drivers?

### 7.1 PRQ6: Was GET FiT an appropriate model to deliver the intended outcomes?

In comparison with other approaches that have been used in Africa to promote private investment in renewable energy, GET FiT stands out in that it provides a balanced and comprehensive set of interventions that are targeted at different barriers for different stakeholders. The fact that GET FiT's interventions were likely necessary for many projects, and that many projects likely required multiple interventions, indicates that GET FiT's model was generally appropriate.

Initiatives to stimulate investment in RE often do not tackle all the barriers in a given country. For example, donor assistance offered to Ghana focused for several years on developing an improved regulatory framework and regulatory capacity, without success. Belatedly it was realized that assistance with PPAs, administration of tenders, and credit support, needed to be added. This is now being done.

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<sup>60</sup> <http://www.oecd.org/dac/evaluation/daccriteriaforevaluatingdevelopmentassistance.htm>

In Nigeria, one donor provided assistance to the Nigerian Bulk Energy Trader (an entity with a role in procuring power similar to UETCL's) in negotiating bulk PPAs with renewable energy developers. However, progress has been slow, in part because no credit support has been provided, and in part because of the decision to proceed by way of negotiation, rather than tender. Nigeria is now moving toward the use of tenders for renewable energy, and considering using a World Bank PRG to back the off-takers obligations to prospective renewable energy IPPs.

Most importantly, in both Nigeria and Ghana, the lack of a premium payment funded by donors leaves renewable energy more expensive than conventional energy, making governments, utilities and regulators less enthusiastic about pursuing it.

Donor interventions that tackle some, but not all, of the barriers to renewable energy investment, are largely a waste of money. This is because, until *all* the barriers have been overcome, there will be no renewable energy investment. GET FiT managed to identify and overcome all the barriers perceived by developers and investors, which is why it is an appropriate design.

## **7.2 PRQ6a: Did the FiT tendering arrangements work and what lessons can be learnt from them?**

KfW and its consultants largely ran the GET FiT tender. The GET FiT tender chose which projects would be eligible for a premium payment from GET FiT. The tender did not procure generation capacity for UETCL. The standard arrangement in Uganda is that the regulator, ERA, chooses which projects receive a generation license. Once a project receives a generation license, its developers then try to negotiate a PPA with UETCL.<sup>61</sup>

Discussions of the general structure of the tendering arrangement, specific aspects of the tendering, and lessons for the future, follow.

### **General structure of the tendering arrangement**

The general structure of the tender puts all tendering and procurement activity in the hands of KfW and its consultants. GET FiT has not supported or aimed to influence or improve the capacity procurement process, and had not supported UETCL in managing such transactions. Trying to improve UETCL's procurement could have significantly expanded the scope, cost, or complexity of GET FiT. Significant capacity building probably would have been required to enable UETCL to carry out procurement—one UETCL employee said in an interview that UETCL would have liked to have the capacity to run the tenders on its own.

Procuring generation is a core function of a well-functioning energy sector. The review of the solar tender commissioned by KfW recommended that local capacity in running procurements should be developed.<sup>62</sup> In future GET FiT programs it would be beneficial to consider:

- Combining into one process the tender to award GET FiT support and the decision by UETCL to sign a PPA with the IPP. This would amount to providing a “stapled subsidy” when an IPP is procured. Then, GET FiT premiums would be guaranteed

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<sup>61</sup> This is based on interviews with KfW and UETCL. The evaluators did not find any legal document specifically saying that UETCL cannot run tenders.

<sup>62</sup> The review was written by Anton Eberhard and Raine Naudé from the Graduate School of Business, University of Cape Town, and Brigitte Baillie from Webber Wentzel.

to IPPs that are procured by the offtaker. However, this could add administrative complexity, or delay program execution.

- Selecting winning bidders for all technologies on the basis of lowest levelized cost of energy among those that meet qualification criteria. GET FiT did this in the solar tender. Developers submitted bids for a full tariff, and GET FiT premium payments filled the gap between the tariff that UETCL would pay, and the tariff that developers require.
- Having national agencies run the tender assisted by consultants or transaction advisors, rather than having the tender effectively run by a development agency. However, this could overload the offtaker's procurement capacity if additional capacity support were required. It could also loosen donors' control over the type of projects that are chosen, and add administrative complexity.

While KfW's decision to essentially run the tender itself may have missed an opportunity to develop local capacity, it did result in a well-run process, as evidenced by the comments of participants. Developer 4 said that GET FiT was the "most professional" donor program it had worked with. Other lenders and developers had similar comments, and noted in particular the useful role that KfW and its implementation consultants played in facilitating communication with Ugandan government agencies, and resolving disagreements within the GoU on the standardized documents.

The GET FiT-supported power plants were chosen through a mix of technical, financial, environmental, and social criteria (for hydropower, bagasse, and biomass). The financial component was not price competition, as tariffs and premium payments were determined through fixed schedules based on installed capacity and technology. However, solar projects with GET FiT support were chosen through competitive bidding on tariffs.

In the future, GET FiT programs should consider using more price-based tenders, rather than scoring projects solely on environmental, social, and technical aspects. Competitive RE tendering based on price has worked well in South Africa for driving down prices. For smaller projects, the transaction costs of running an auction may somewhat reduce the relative benefit of a competitive tender. That being said, tenders have reduced prices for small solar in Jamaica<sup>63</sup> (US\$0.085 per kWh for 22MW of solar PV), and a tender for a 20MW solar plant in Ghana recently concluded with offers that were below the REFiT tariff offered in Ghana. In Nigeria, a group of developers conducting bilateral negotiations for PPAs reduced their offered tariffs from US\$0.17 to US\$0.12, after the Government of Nigeria announced plans to hold competitive procurement. It is likely that developers reduced their tariffs to a level more in line with what they expected competition to produce.

While opinions differ, and there are cases in which feed-in tariffs may be appropriate, the recent success of tenders in procuring renewable power at prices lower than could be achieved in other ways suggests that price-based tenders merit consideration.

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<sup>63</sup> <http://newenergyevents.com/jamaicas-solar-ppa-breaks-records-at-8-5-centskwh-whos-the-big-winner/>

### Specific aspects of the tendering

No serious issues in regards to transparency of the tender were raised by developers. However, some developers did criticize certain aspects of its design.

Four developers and one lender said that the deadlines for meeting CPs<sup>64</sup> were unreasonably short. One developer said the deadlines were particularly challenging as it was working on a project on the border with Uganda and Tanzania. That project took longer to develop because of the work required to get approvals from two governments. Developer 10 said that the deadline for obtaining title to land in the solar tender was particularly tight. Developer 5 said the same for hydropower projects. That being said, KfW has given “numerous extensions to almost all developers”, including the developer of the project on the border.<sup>65</sup> It seems GET FiT is working hard to flexibly accommodate developers’ needs, while also keeping the overall program on a reasonable timeline.

One developer, Developer 4, said that the turnover (revenue) requirement for the solar tender was unreasonable. Its consortium included a large firm that has hundreds of millions of Euros in annual turnover. However, this was not counted towards the required EUR20 million turnover. Developer 4 also thought that turnover is an inappropriate requirement for developers and private equity firms, as they generally do not have turnover.

The technical standards in the solar tender were probably too specific. Innovation and efficiency are increased when standards focus on power quality, and grid connection standard, rather than requiring particular designs or equipment. GET FiT’s technical specifications may have been too strict, setting narrow requirements for individual components, rather than for the quality of power produced.<sup>66</sup> This may have prevented developers from choosing the least cost option to meet requirements.

Some developers thought the technical requirements for the solar tender were too specific. One of the winning developers in the solar tender said that the technical requirements were “quite high” and maybe “slightly over-engineered”. One developer with an unsuccessful bid said that many projects were rejected from the solar tender for “pedantic technical reasons”.

This is corroborated in the review of the solar tender commissioned by KfW:

*Bidders were unanimous in the opinion that the technical specifications were far too onerous, particularly for such a small project. ...Bidders understood the objective for standardizing and prescribing all components but also felt that it stifled innovation and flexibility in terms of trying to reduce costs. Whilst the RfP technical specifications annex stated that the specifications would allow for deviations, these were sometimes refused in practice.<sup>67</sup>*

Since IPPs have to produce power to collect revenue, they have a natural incentive to build power plants well. If plants are built poorly, then they will not produce power, and thus not receive revenue. Less stringent requirements may increase the risk of developers building low

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<sup>64</sup> CP stands for condition precedent. A condition precedent is a requirement that has to be met for a contract to be effective. In the case of GET FiT, DFAs had many CPs related to meeting E&S requirements.

<sup>65</sup> Kathrin Kaestle from KfW

<sup>66</sup> For example, standards from IEC (International Electrotechnical Commission). IEC sets standards for connecting RE and other technologies to the grid.

<sup>67</sup> The review was written by Anton Eberhard and Raine Naudé from the Graduate School of Business, University of Cape Town, and Brigitte Baillie from Webber Wentzel.

quality projects. However, as developers have to collect revenue over the life of the project to earn money, this risk is probably low, and in any case largely borne by the developer.

More technical flexibility may encourage developers to build lower cost projects that still comply with grid requirements.

**Lessons:**

- Deadlines for CPs should be adjusted to reflect the circumstances of different projects. GET FiT did well in adjusting deadlines as problems arose.
- Technical criteria should not be so specific as to hinder innovation or reduce the potential for cost reduction.

**Recommendations:**

- Other programs should consider focusing technical criteria on output specifications to allow for effective interconnection to the grid, and giving more leeway to developers in choosing what components to use meet those standards.

### **7.3 PRQ6b: Was the choice and arrangements with the implementation consultant appropriate?**

A distinguishing feature of the arrangement with the implementation consultant has been the extent to which the implementation consultant (Multiconsult) was responsible for the day-to-day implementation of GET FiT, under KfW's supervision. The GET FiT tenders were implemented by KfW and the implementation consultant, or other consultants, rather than by the GoU. The GET FiT Secretariat was staffed by the implementation consultant. This approach had benefits in speed and credibility of execution, but costs in terms of reduced capacity building.

Execution by the implementation consultant through the GET FiT Secretariat, rather than the GoU, gave KfW control over the execution of the program. This control helped to ensure that the program was executed quickly. Lenders and developers reported that the arrangement provided credibility and transparency, and ensured a reasonable approach. GoU stakeholders thought the implementation arrangement was generally beneficial.

On the other hand, the limited involvement of ERA and UETCL staff in designing and running the process limited transfer of knowledge, according to some senior government officials. Some steps have been taken to improve knowledge transfer to ERA, including: holding a TA session at the GET FiT Forum in May 2016; sharing project appraisal reports with ERA; and twinning ERA staff with GET FiT consultants during the last procurement round.<sup>68</sup> Nevertheless, because the Ugandan public sector staff were not hands-on in many parts of the execution, the learning by doing which produces seasoned practitioners were less than it might have been.

**Lessons:**

- Having a donor program run a tender, instead of local entities, presents trade-offs between efficiency of the tender and capacity building for the beneficiary country. The choice to favor one or the other may depend on a country's goals. If a country is focused on increasing power production quickly, then it may be better to have a donor program run the tender. If capacity

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<sup>68</sup> Kathrin Kaestle from KfW.

building is the dominant goal, then it may be better to increase the beneficiary government's involvement in the tender.

## 8 Learning

Development projects should be designed to allow learning, in order to improve both ongoing operations and the design of future interventions. This section answers learning-focused questions:

- What systems and processes are in place to effectively deliver the intended results and learn lessons? (PRQ5)
- What lessons can be learned from the interaction between the World Bank guarantee insurance and the GET FiT program? (PRQ7)
- What lessons can be learned from the World Bank guarantee issuance and impact on cost of capital and which products required guarantees and which did not etc? (PRQ7.1)

This section also explores lessons which may emerge in later evaluations, so developers of other similar programs can consider the points.

### 8.1 PRQ5: What systems and processes are in place to effectively deliver the intended results and learn lessons?

This question is about monitoring, control, and learning systems. These systems are best considered in two time periods. In the short-term, GET FiT needs systems that let it know if progress is on track so that it can take corrective action—within the overall framework of the program design—if it appears that the intended results may not be achieved. In the longer-term, donors and the GoU need to learn what has worked well, and what could have been better, in order to inform the design of future programs. Figure 8.1 illustrates how the project cycle should incorporate monitoring and learning.

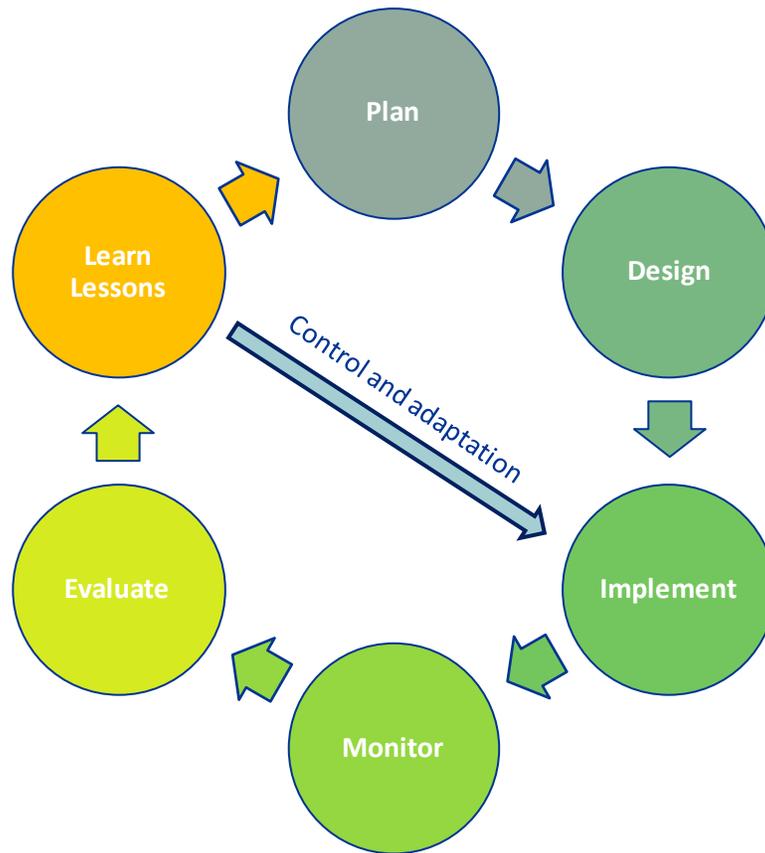
Table 8.1 sets out the systems and processes designed into GET FiT for control, adaptation and learning.<sup>69</sup> It also indicates the extent to which GET FiT has implemented these systems in practice. The information in this table comes from program documentation and interviews. The extent to which GET FiT's systems and processes accord with project cycle best practice is evaluated in Table 8.2.

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<sup>69</sup> The plans were found in the Monitoring and Evaluation Framework for GET FiT.

Figure 8.1: Project Cycle

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Note: This project cycle diagram was adapted from evaluation guidance from multiple sources including: the UN (<http://www.unodc.org/unodc/en/evaluation/evaluation-and-the-project-programme-cycle.html>), and USAID ([https://usaideallearninglab.org/sites/default/files/resource/files/39-usaid\\_program\\_cycle\\_overview\\_summary.pdf](https://usaideallearninglab.org/sites/default/files/resource/files/39-usaid_program_cycle_overview_summary.pdf))

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Table 8.1: Plans and Practice for Control and Adaptation, and Learning Lessons

Planned Process	For control and adaptation	For learning	Source for Plans	Actual practice	Source for Actual	Practice agrees with plans so far
Performance Reviews in 2015, 2017, 2019	✓	✓	M&E Framework, page 23	Evaluation consultant hired and has drafted the 2015 review. The 2017 and 2019 reviews will occur according to the contract with the evaluation consultant.	Castalia	✓
Logframe indicators to be reported every six months to KfW	✓		M&E Framework, page 23	Logframe indicators have been reported through the end of 2015 at six month intervals in the logframes from the monitoring consultant (Multiconsult). They were also published in the 2014 and 2015 Annual Reports. Some indicators were missing, because UETCL has not yet provided them. Some logframe indicators were improved based on comments from the evaluation consultant, to help ensure that indicators better reflect desired results, and are less open to influence from factors outside GET FiT.	Annual Reports, logframe spreadsheets from Multiconsult	✓
Evaluation reports will be disseminated as soon as possible and in forms that are easy to understand and use, to stakeholders and other audiences	✓	✓	M&E Framework, page 24	The First Performance Review, and its findings, will be presented at a workshop in May 2016. Plans for other public dissemination may be made later	Castalia	✓
Implementation consultant will prepare relevant project reports and share them with GoU, KfW, and development partners	✓		M&E Framework, page 35	Yes, annual reports have been shared with stakeholders, and published online.	Interviews	✓

Note: This table is not intended to generate lessons, but rather track if and how GET FiT followed its own plans for activities that should result in learning.

Table 8.2: Rating Against the Project Cycle

Stage	Question	Answer	Source
<b>Plan</b>	Were targets and relevant indicators defined for GET FiT?	Yes. They were defined in a logframe, with annual targets.	M&E Framework, logframe spreadsheet from Multiconsult
<b>Design</b>	Was a program created for GET FiT to follow to meet the targets?	Yes. GET FiT had a clear plan to provide certain policy interventions to reach targets.	UK Business Case for GET FiT, GET FiT Annual Report 2013.
<b>Implement</b>	Did GET FiT follow the program in practice?	Yes. GET FiT has offered all the planned interventions.	GET FiT Annual Reports, indicators.
<b>Monitor</b>	Were measurements of GET FiT's results indicators collected?	Yes. They have been collected in a logframe. Some indicators were missing, but the evaluator expects these will be made available later. GET FiT is waiting to receive data from UETCL.	Logframe spreadsheet from Multiconsult
<b>Evaluate</b>	Was the data from monitoring used to gauge how well GET FiT is performing, and to find reasons for that performance, in both the short-term and long-term?	Yes. This is being in this report. Also, the Annual Reports for 2014 and 2015 included thoughtful analyses of challenges faced by GET FiT. Annual Reports will be issued until the program ends. Two Performance Review and Evaluation Reports will be prepared, in 2017 and 2019.	GET FiT Annual Reports, Castalia
<b>Learn Lessons</b>	Were lessons found through evaluations, shared with relevant stakeholders, and incorporated in to plans for future interventions?	There are plans in place to share this evaluation's findings in a workshop in May 2016. They will also be shared with KfW and United Kingdom Government staff working on other GET FiT programs. This report is intended to draw insights for other interventions, as will later reports in this engagement. Emerging lessons for other interventions are discussed in Section 9.	Castalia
<b>Ongoing Learning</b>	Were iterative changes made to improve the continuing operations of GET FiT, based on lessons learned from GET FiT's earlier experience?	Yes. Good examples are the response to exchange rate fluctuations (Section 4.2); changing the PPA and IA to find a way to treat deemed energy that is suitable to UETCL; and holding workshops to help developers meet E&S requirements. GET FiT also modified the Theory of Change and logframe after Castalia proposed an improved version.	GET FiT Annual Reports, interviews by Castalia

Note: These questions were proposed by Castalia and agreed with the client. They were designed to capture the purpose of each stage of the project cycle.

A representative of the European Union, one of the donors funding GET FiT, said that program monitoring works well. There have been sufficient documents and meetings. Kathrin Kaestle from KfW emphasized that there have also been many informal interactions between donors in which information was shared, such as lunches.

E&S standards have been challenging for developers. GET FiT responded to this well by running two workshops (Developer Week in 2014 and the Developer Workshop in 2015). These workshops helped developers, and their consultants, with the E&S standards. Developers who discussed the workshops in interviews thought they were helpful (Developer 5, Developer 3, Developer 12, and Developer 9).

It is noteworthy that GET FiT held workshops which were not part of the original program budgets. These workshops were conceptualized after developers started having problems meeting E&S requirements, and demonstrate a dynamic response to a challenge.

KfW has also established a good system to ensure transfer of knowledge between staff who have more experience with GET FiT, and staff with less experience.<sup>70</sup> Jan Martin Witte, who was heavily involved in designing GET FiT Uganda, is sharing his experience with a new pool of KfW managers who will work with GET FiT programs in other countries. Stephanie Rieger, who was in Uganda but is now based in Germany, is available for consultation with staff working on other GET FiT programs. Kathrin Kaestle is also available for consultation. Furthermore, when Project Managers change in KfW country offices, the new manager arrives two months before the previous manager leaves. This provides a two-month window for transferring knowledge.

**Finding:**

- GET FiT is generally following its plans for control and adaptation, and learning, well. Those plans are well designed, and GET FiT has incorporated ongoing learning into its operations. Castalia, as evaluator of the program, has been charged with aiding learning over the longer term.
- GET FiT has a good system in place to transfer knowledge between KfW staff working on different GET FiT programs.

## **8.2 PRQ7(a,b,c,d): What lessons can be learned from the interaction between the World Bank guarantee insurance and the GET FiT program?**

No PRGs have been taken up by GET FiT-supported projects.<sup>71</sup> The analysis of why PRGs were not used is provided in Section 5.2. The main reason they were not used is because 15 of 17 projects were not eligible. Only two projects were eligible by having project finance loans from a commercial lender.

The experience of the GET FiT PRGs indicates that they were not necessary for Uganda. Quite simply, projects are going ahead without PRGs. This is because the vast majority of projects had loans from DFIs, or corporate financing from commercial banks, and thus were ineligible for PRGs. Two projects had commercial loans in the form of project financing, and

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<sup>70</sup> Kathrin Kaestle from KfW.

<sup>71</sup> This section discusses Performance Review Questions 7,7a,7b,7c, and 7d, as they are all about PRGs, and closely related to each other.

could have been eligible for a PRG. However, the lender to both those projects plans to use political risk insurance from ATI instead.

If more developers had taken out project financing loans from commercial banks, then more evidence may have been collected, and thus enabling better recommendations on whether alternatives to the PRG may have worked better. The experience of the one commercial bank mentioned, indicates that existing risk mitigation instruments, like political risk insurance, are adequate.

Research was conducted on PRGs for small RE, to see if lessons could be learned from other countries. Unfortunately, the use of PRGs for small RE outside Uganda is very limited. As of April 30 2016, no other PRGs for small RE have been issued anywhere. However, one PRG for a small RE project in Maldives is in the final stages of negotiations.<sup>72</sup> The project is a 1.5MW solar PV plant.<sup>73</sup> The PRG contract was expected to be signed in May 2016. The project’s developer would be the beneficiary of the PRG. The Maldives PRG is compared to the GET FiT PRG in Table 8.3.

**Table 8.3: Comparison of PRGs for Small RE**

		Uganda GET FiT	Maldives
<b>Risks Covered</b>	Off-taker payment	✓	✓
	Termination	✓	✓
<b>Who is Covered</b>	Developer	✓	✓
	Lender	✓	
<b>Technologies</b>	Bagasse	✓	
	Biomass	✓	
	Hydropower	✓	
	Solar	✓	✓
<b>Number of PRGs Issued</b>		None	1 is expected by early May 2016

Source: World Bank flyer on GET FiT PRGs, World Bank Project Appraisal Documents for PRGs in Uganda and Maldives, interviews and emails with World Bank staff.

Furthermore, a PRG may be better suited to larger projects which can afford higher fees and put more effort into an application. For example, the Bujagali hydropower project in Uganda, whose installed capacity is 12.5 times larger than the largest project supported by GET FiT, has a PRG. The Azura natural gas power plant in Nigeria has a PRG, and installed capacity that is 22.5 times large than the largest project support by GET FiT.

Replication of GET FiT’s interventions in other countries could be indicative of global transformation. The GET FiT PRG offering was approved by the World Bank Board in March 2014. The World Bank has replicated the packaging and “no objection” arrangements for PRGs outside Uganda:

<sup>72</sup> Interviews with World Bank staff who work on PRGs.

<sup>73</sup> <http://www.environment.gov.mv/v1/news/project-agreements-for-the-first-phase-of-accelerating-sustainable-private-investments-in-renewable-energy-aspire-project-signed-today/>

- Maldives: PRG for small RE (approved in June 2014)
- Kenya: PRG for power plants with any technology (approved in November 2011)
- Nigeria: PRG for RE in general (approved in May 2011)

For brevity, this type of PRG is referred to as a “series PRG”. A series arrangement reduces some of the work required to approve a PRG at the World Bank. The difference between a regular PRG and a PRG in a series arrangement is shown in Table 8.4.

**Table 8.4: Comparison of Normal and Series PRGs**

Stage of Normal PRG Process	Description	Included in Issuance of Each PRG in a Series
Concept review	A concept note is prepared through a formal process led by the Country Director. This stage is concluded with an approval meeting, in which the concept may be accepted or rejected, or changes may be proposed.	Only once to establish the series
Decision Meeting	This meeting determines whether a PRG receives “authorization to appraise”. This authorization starts the work required to receive approval from the Board of Directors	✓
Appraisal	The World Bank conducts due diligence on technical, economic, environmental, financial, and social issues.	
Approval from World Bank’s Board of Directors	The World Bank’s Board of Directors votes on whether to issue a PRG to a specific project.	✓
Negotiate legal agreements	The World Bank negotiates with relevant project stakeholders (developer, lenders) to prepare the PRG contract. This often, but not always, happens after approval from the Board.	✓

Source: Interviews with current and former World Bank staff, Project Appraisal Document for the GET FiT PRGs.

This structure reduces work for World Bank staff if multiple PRGs are issued, as the concept review is only done once. The chief benefit may be providing certainty for country governments, developers, and lenders once the concept is approved. After the concept is approved, it is fixed for the series.

Since Uganda did not have the first series PRG, there was no transformational change through replication of the series PRG arrangement.

<p><b>Key findings:</b></p> <ul style="list-style-type: none"> <li>▪ Most GET FiT projects (15) did not use PRGs because they were not eligible</li> <li>▪ The two projects that were eligible did not use PRGs, because their developer and lender preferred another risk mitigation instrument that would be less cumbersome</li> </ul>
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- No other PRGs for small RE have been issued anywhere in the world, although one is expected
- GET FIT's PRG was not the first series PRG, so there was no transformational change through replication

## 9 Key Findings and Suggestions for Design of Similar Programs in the Future

While answers to most of the evaluation questions will only come 4 years from now in the Third Performance Review and End-Term Evaluation Report, some findings are already possible. Equally, while the real lessons from experience will only emerge as GET FiT plants are commissioned and operate, there is already information emerging that may help guide the design of similar programs in the future. This section summarizes the findings so far, and provides suggestions for consideration in the design of similar programs in the future.

### 9.1 Key Findings

#### **What proportion of the change in investment in RE occurred as a result of GET FiT?**

So far only one power plant supported by GET FiT has started operation, and only four have reached financial close. A full answer to this question must await the next reports (2017 Second Performance Review and Mid-Term Evaluation, and 2019 Third Performance Review and Mid-Term Evaluation). By that time, it is likely that many of the 16 projects now being developed, but not yet operational, will be in operation. Then, GET FiT's share of the power plants in the total additional RE investment can be assessed.

#### **To what extent has GET FiT addressed the barriers to private sector investment in RE projects in Uganda?**

Sixteen small scale, privately financed RE plants are now under serious development, and one is already operational. In the decade before GET FiT, only six small scale, privately financed RE power plants were developed<sup>74</sup>.

GET FiT took a comprehensive approach to addressing a suite of barriers to private investment in RE generation, which seems to be working.

- **The premium payment** overcomes the barrier that payments to RE plants under the REFiT are too low to allow an adequate return on equity investment, and compliance with standard lenders covenants, in many cases. The additional revenue stream provided by the GET FiT premium was described by lenders as necessary to allow them to finance the projects now being developed. Developers and equity investors too said that they needed this top up to justify investment in a number of the plants. While some projects not supported by GET FiT were viable without the top up because of exceptional hydro-resources or other project-specific factors, the evidence suggests that all the 17 projects supported by GET FiT did need the premium in order to attract investment.
- **The standardized PPAs (Power Purchase Agreements) and IAs (Implementation Agreements)** seem to have been necessary for 12 projects to get finance, since lenders said that without these standard documents, they would not have been willing to spend time assessing the projects. The PPA were especially

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<sup>74</sup> See Section 5.1. Buseruka is also counted as coming online before GET FiT, since it was largely developed before the program officially launched, and received no support from GET FiT.

useful for developers that did not already have a PPA in Uganda, and those who lacked in-house legal teams (see section 5.2.2 for more).

- **The capacity building for the electricity regulator (ERA)** may have enabled ERA to process 15 project licenses within 1 year and four months<sup>75</sup>. This is a big step up from the two licenses issued in 2014 and 2015. Five out of the six developers with an opinion on the topic thought that ERA's capacity had increased. ERA manager and staff were clear that this increase was due in good measure to assistance provided by GET FiT. However, this matter will be examined in more depth in future reports by looking at trends in the total number of applications processed, in addition to licenses granted.
- **The Partial Risk Guarantees (PRGs) offered by the World Bank were not used.** Only two projects had the private debt finance required to benefit from the World Bank PRG. These projects did not take up the PRG as they thought it too cumbersome for the benefits offered. The other projects either had no project-level debt, or were financed by DFIs, and were, therefore, not eligible for PRG protection (see Section 5.2.4).
- **GET FiT's support for deep interconnection** reduced the risk of power from 10 plants not being able to reach load, and so reduced the risk of deemed power payments. UETCL indicated that without the deep interconnection support offered, it would not have been willing to sign PPAs for these plant (see Section 5.2.5).

#### **What evidence is there that GET FiT has had transformational impact?**

Unlike many other programs aiming to support investment in RE, GET FiT addressed a suite of barriers to investment. Early signs are that this is working. However, to be truly transformational, the effects would have to extend beyond the 17 projects directly supported by GET FiT. There are some signs this is happening; developers are using the GET FiT PPAs for other non-GET FiT projects. On the other hand, there is also a risk that Uganda may have a glut of renewable energy in years to come just with the various projects now under development. If this happens, there will be little need for further private investment in RE for a period, making the question of transformational impact moot (see Appendix A).

#### **How well was GET FiT incorporated adaptation and learning into its activities?**

GET FiT has generally done well incorporating adaptation and learning into its structure and operations, including adapting to unforeseen challenges. GET FiT has responded to unforeseen problems, including exchange rate fluctuations reducing funding for the program, and developers' difficulties in meeting environmental and social requirements (see Section 8).

#### **What lessons can be found in GET FiT's experience with challenges?**

GET FiT's responses to challenges are analyzed in Section 4.2. Insights from that experience follow:

- **GET FiT's expectations about receiving bids for biomass and bagasse power plants were optimistic.** Uganda does not have many large agribusinesses

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<sup>75</sup> See Section 5.2.3.

which could develop projects. It seems GET FiT actually did well in attracting bids for bagasse projects from two of four large sugar producers in Uganda.

- **More or earlier coordination with government could help reduce or avoid delays due to tax uncertainty.** GET FiT worked with the Government to resolve tax uncertainty faced by developers, which delayed progress. A more proactive approach would have involved dialogue with the tax authorities, before the tender, and throughout the period in which support was offered, to ensure that the tax position for renewable energy projects was clear, and clearly communicated.
- Exchange rate risk can have significant impact on program results, either through risk in funding flows to the program, or in subsidy flows paid by the program. GET FiT reduced the size of its target portfolio due to an appreciating Euro, which reduced the value (in Euro terms) of some funding allocated in other currencies. There is similar risk in paying subsidies in Euros, but calculating them in US Dollars. GET FiT responded to this uncertainty by accelerate disbursements of funding and fixing the exchange rate used between Euros and US Dollars—this shifted exchange rate risk away from GET FiT and on to developers and investors.

### **9.1.1 Interest in replicating GET FiT in other countries**

Interviewees seemed interested in pursuing projects with support from GET FiT programs in other countries. The vast majority of developers, and investors, and lenders interviewed for this engagement were potentially interested in pursuing projects with support from GET FiT programs in other countries:

- Eight developers with GET FiT-supported projects said they were interested in other GET FiT programs. Four of those eight said they were interested in Zambia, where GET FiT is likely to be launched next.
- Two equity investors, and three lenders also expressed interest in outer countries (including one commercial lender).
- Three developers and one investor who did not submit bids to GET FiT Uganda said they would be interested in GET FiT programs in other countries. However, they prefer projects that are at least 50MW.
- Five developer who submitted unsuccessful bids to GET FiT said they were interested in GET FiT programs in other countries. One developer who was successful in the GET FiT tender, but had support revoked, was also interested.

Implementers of GET FiT programs outside Uganda should bear in mind that Uganda may have been a relatively favorable environment for implementing such a program. Conditions in Uganda such as the ability to enforce contracts, the financial viability of the electricity sector, the absence of conflict, and the presence of suitable hydro-resources, were likely necessary for GET FiT to succeed as it has. In countries with different conditions, different approaches would probably be needed.

## **9.2 Suggestions for Design of Future Programs**

Since this is only the first report in a series of three, with the others to be completed over the next five years, it is premature to offer firm lessons or recommendations. Nevertheless, we know that a number of other countries are considering programs similar to GET FiT, and

Uganda itself may consider whether GET FiT initiatives should be continued. We makes four suggestions for consideration, based on the evaluation of GET FiT so far.

**1. Clearly communicate environmental and social (E&S) standards at the start of a tender**

IFC Performance Standards are applied by different agencies in different ways. Developers need a clear understanding of how the standards are to be applied, and what information they will need to provide to show that they comply. Developers also need clear feedback on how to improve environmental and social analyses that are found to be deficient.

Where implementation consultants are used, communicating to developers in detail what they need to do to comply should be part of the consultant's terms of reference.

**2. Integrate selection of power plants for subsidy with selection of power plants for supply of energy to the grid, using cost of energy as decision criterion**

In practice, GET FiT ran a tender to select which power plants to support. There were separate processes for obtaining licenses and agreeing Power Purchase Agreements (PPAs) with UETCL (Uganda's single buyer of electricity).<sup>76</sup> This required developers to go through multiple processes where potentially a single selection process would suffice.

Moreover, nowhere in the selection process is value for money considered. Some projects are lower cost than others. However, rather than selecting the projects that can supply power at least cost, the system adopted in Uganda pays all projects the same.

There is a growing realization that feed-in tariff regimes of the sort adopted in Germany, Spain, and Italy result in power consumers paying more than they need to for power. Feed-in tariffs also result in greenhouse gas emission reduction costing more than it needs to.

For grid-connected projects selling under PPAs it is now widely considered to be best practice to use competitive tenders that select projects on the basis of lowest cost of energy (subject to compliance with various qualification, technical, environmental and social criteria).<sup>77</sup>

Future GET FiT programs should consider selecting power plants to support, and setting the premium payment, through a competitive auction (at least in cases where there is a single buyer of power, as in Uganda where UETCL is the single buyer). In such an auction, all bids would need to comply with environmental and social standards, or be rejected. Among compliant bids, those selected would be the ones offering the lowest cost of energy. Power plants would be awarded a premium equal to the difference between the REFiT and the cost of energy bid. A ceiling could be set at the level that would be used for the GET FiT premium under a fixed-premium approach.

Under this system, no plant would receive a premium greater than the fixed premium, and some would receive lower premia. By paying some plant less than the ceiling, the program would save money—money it could make available to support other power plants.

Further, if the project agreements required the bidder to pay the cost of shallow interconnection, that cost would be factored into the cost of energy. This would then co-

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<sup>76</sup> See Section 2.3.1

<sup>77</sup> <http://www.gsb.uct.ac.za/files/PPIAFReport.pdf>

optimize generation and transmission (at least at the shallow interconnection level) since both costs would be considered together, and plants with the lowest combined cost would be selected.

In design of future programs, it may be well worth considering:

- **Combining the selection of projects for program support, PPAs and licences into a single process.** Under a unified process, the tender documents would require bidders to submit all the information needed for award of the PPA, a license, and financial support, in the bid package. The decision on the PPA might still need to be made by the single buyer, while the license was decided on by the regulator and financial support might be decided on by the funding provider. Nevertheless, qualification criteria could be harmonized (for example on technology requirements, financial capacity, and probity or good standing). The entities involved in making the decisions on each award (PPA, license and financial support) could all review the applications at the same time, and consult with each other before the decision is made. The goal would be to ensure that successful bidders get all the approvals they need in a single, harmonized, competitive process.
- **Supporting the single buyer of energy (where there is one) to develop the capacity to run auctions** to select generation projects, by having them participate in or indeed implement the tender by which successful plant are selected.

## **Appendix A: Logframe Results for Outputs**

Table A.1 shows the progress towards targets for individual outputs in 2014 and 2015. In the columns showing results, the cells are colored as follows:

- Green means a milestone was met or exceeded
- Yellow means a milestone was close to being met (within 80 percent of milestone)
- Red means a milestone was not close to being met (less than 80 percent of milestone).

Table A.1 shows results related to power plants that were supported by GET FiT. That does not mean these results were necessarily caused by GET FiT (attributable to the program). The results attributable to GET FiT are discussed in Sections 5.3 and 5.3.1.

Table A.1: Logframe Results for Outputs

Indicator	Units	Notes	Type	Milestones				Target
				2014	2015	2016	2017	2023
<b>OUTPUTS</b>								
<b>Increased small-scale RE capacity and generation</b>								
Installed capacity (reached COD), total:	MW	-	Targets	0	28	85	123	170
			Actual	0	20			
Small hydropower	MW	-	Targets	-	-	-	-	-
			Actual	-	0			
Bagasse	MW	-	Targets	-	-	-	-	-
			Actual	-	20			
Solar	MW	-	Targets	-	-	-	-	-
			Actual	-	0			
Biomass	MW	-	Targets	-	-	-	-	-
			Actual	-	0			
Power delivered to national grid per year	GWh	-	Targets	0	202	453	633	830
			Actual	0	146			
Small hydropower	GWh	-	Targets	-	-	-	-	-
			Actual	0	0			
Bagasse	GWh	-	Targets	-	-			
			Actual	0	292			
Solar	GWh	-	Targets	-	-	-	-	-
			Actual	0	0			
Biomass	GWh	-	Targets	-	-	-	-	-
			Actual	0	0			
	#	-	Targets	-	-	-	-	-

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Indicator	Units	Notes	Type	Milestones				Target
				2014	2015	2016	2017	2023
Number of GET FiT-supported projects that have reached COD			Actual	0	1			
<b>Balanced portfolio of RE technologies</b>								
Number of technologies supported by GET FiT	#	1,2	Targets	4	4	-	-	-
			Actual	3	3			
Number of sub-regions of Uganda with GET FiT-supported projects	#	3	Targets	4	5	5	5	5
			Actual	5	5			
Distribution of technology types (that reached COD), by:	-	-	-	-	-	-	-	-
Percent of total projects	-	-	-	-	-	-	-	-
Small hydropower	%	-	Targets	-	-			-
	%	-	Actual	0%	0%			
Bagasse	%	-	Targets	-	-			-
	%	-	Actual	0%	100%			
Solar	%	-	Targets	-	-			-
	%	-	Actual	0%	0%			
Biomass	%	-	Targets	-	-			-
	%	-	Actual	0%	0%			
Percent of generation capacity	-	-	-	-	-	-	-	-
Small hydropower	%	-	Targets	-	-	-	-	-
	%	-	Actual	0%	0%			
Bagasse	%	-	Targets	-	-	-	-	-
	%	-	Actual	0%	100%			
Solar	%	-	Targets	-	-	-		-
		-	Actual	0%	0%			

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Indicator	Units	Notes	Type	Milestones				Target
				2014	2015	2016	2017	2023
Biomass	%	-	Targets	-	-	-	-	-
	%	-	Actual	0%	0%			
Percent of annual electricity output								
Small hydropower	%	-	Targets	-	-	-	-	-
	%	-	Actual	0%	0%			
Bagasse	%	-	Targets	-	-	-	-	-
	%	-	Actual	0%	100%			
Solar	%	-	Targets	-	-	-	-	-
	%	-	Actual	0%	0%			
Biomass	%	-	Targets	-	-	-	-	-
	%	-	Actual	0%	0%			
<b>Finance mobilized for GET FiT portfolio</b>								
Private finance mobilized for GET FiT, millions (financial close)	US\$	4	Targets	79	125	-	-	200
			Actual	0	78			
Public finance mobilized for GET FiT, millions (financial close)	US\$	4	Targets	79	185	-	-	300
			Actual	0	29			
<b>Interconnection infrastructure</b>								
Infrastructure projects built by GET FiT	#	-	Targets	-	-	-	-	-
			Actual	0	0%			

Source: [Insert source if citing a third party. If source is Castalia delete the line]

The notes that were referenced in Table A.1 are explained in Table A.2.

**Table A.2: Notes on Outputs**

Note Number	Note
1	“Supported by” means selected for support by GET FiT
2	The technologies supported by GET FiT are bagasse, biomass, hydropower, and solar
3	The sub-regions are West, South West, North, East, and Central
4	Castalia has only counted projects reaching financial close as having finance mobilized. As of 29 April 2016, four projects reached financial close (Kakira, Muvumbe, Siti I, and Soroti). Castalia believes relying on financial close is a good way to track mobilization of finance, because financial close is a concrete, legal commitment to provide money. Before financial close, financing arrangements could change significantly

The results data shown in the tables were provided by GET FiT’s monitoring consultant (Multiconsult), except where noted. Castalia improved the definitions of some indicators, and verified some indicators that were reported by the monitoring consultant. The indicators, and the verification method, are shown in Table A.3.

**Table A.3: Verification of Logframe Indicators for Outputs**

Indicator	Verification Method
Installed capacity (reached COD), total	Confirmed installed capacity of power plants in interview with developer
Power delivered to national grid per year	Confirmed power delivered by power plant in interview with developer.*
Number of GET FiT-supported projects that have reached COD	Confirmed that projects reached COD in interview with developer
Number of technologies supported by GET FiT	Confirmed projects’ technologies in interviews with developers
Private finance mobilized for GET FiT (financial close)	Confirmed financing in interviews with developers, equity investors, lenders*
Public finance mobilized for GET FiT (financial close)	Confirmed financing in interviews with developers, equity investors, lenders*

Note: The list of interviews is found in 0.

\*Note: This was verified with developers because the data in the original logframe reporting was taken from UETCL. Data were then verified by an alternate source.

\*\*Note: The projects that have reached financial close as of 29 April 2016 are Kakira, Muvumbe, Siti I, and Soroti.

## **Appendix B: Logframe Results for Outcomes and Impacts**

Table B.1 shows the progress towards targets for outcomes and impacts in 2014 and 2015. These tables show all results that were reported.<sup>78</sup>All data come from a logframe spreadsheet provided by Multiconsult, unless otherwise noted. In Section 5.3.1, the attributed results are shown. In the columns of the table showing results, the cells are colored as follows:

- Green means a milestone was met or exceeded
- Yellow means a milestone was close to being met (within 80 percent of milestone)
- Red means a milestone was not close to being met (less than 80 percent of milestone).

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<sup>78</sup> In Section 5.3.1, the attributed results are shown.

Table B.1: Logframe Results for Outcomes and Impacts

Indicator	Units	Note	Type	Milestones				Target
				2014	2015	2016	2017	2023
<b>OUTCOMES</b>								
<b>Improved private sector investment environment for renewable energy</b>								
Number of commercial banks that invest in renewable energy	#	-	Targets	0	1	-	-	5
			Actual	0	3			
Occurrence of annual "UETCL event of default" in accordance with PPA	#	-	Targets	0	0	-	-	0
			Actual	0	0			
Number of projects with defaults for supplied energy	#	-	Targets	-	0	-	-	0
			Actual	0	0			
Number of projects with defaults for deemed energy	#	-	Targets	-	0	-	-	0
			Actual	0	0			
Total value of defaults	\$	-	Targets	-	0	-	-	0
			Actual	0	0			
REFiT adjusted to be cost-reflective (percent)	%	6	Targets	100%	100%	-	-	100%
			Actual	92%	Not reported			
Hydro (9MW to 20MW)	%	-	Targets	100%	100%	-	-	100%
			Actual	87%	100%			
Hydro (1MW to 8MW)	%	-	Targets	100%	100%	-	-	100%
			Actual	82%	100%			
Hydro (0.5MW to 1MW)	%	-	Targets	100%	100%	-	-	100%
			Actual	86%	100%			
Bagasse	%	-	Targets	100%	100%	-	-	100%
			Actual	89%	100%			
Biomass	%	-	Targets	100%	100%	-	-	100%

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Indicator	Units	Note	Type	Milestones				Target
				2014	2015	2016	2017	2023
			Actual	95%	100%			
Biogas	%	-	Targets	100%	100%	-	-	100%
			Actual	100%	100%			
Landfill Gas	%	-	Targets	100%	100%	-	-	100%
			Actual	100%	100%			
Solar PV	%	-	Targets	100%	100%	-	-	100%
			Actual	99%	61%			
Wind	%	-	Targets	100%	100%	-	-	100%
			Actual	95%	100%			
Subsidy paid by GoU to UETCL to cover thermal power costs	\$	6	Targets	0	0	-	-	0
			Actual	0	0			
Power purchased by UETCL from thermal stations	GWh	7	Targets	4.7	200.0	-	-	832
			Actual	8.8	57.7			
Cost-reflective retail tariffs in place	%	6	Targets	94%	95%	-	-	100%
			Actual	92%	91%			
<b>Improved local grid stability</b>								
Portion of time voltage is outside Grid Code at local substations	%	12	Targets	0.00	0.00	-	-	0.00
			Actual	0	0			
Load shedding at local substations due to grid constraints (MWh)	MWh	-	Targets	0.00	0.00	-	-	0.00
			Actual	Not reported	Not reported			
Frequency fluctuations at local substations	%	13	Targets	-	-	-	-	-
			Actual	Not reported	Not reported			
<b>Improved reliability of supply</b>								
Average hours of supply per day	Hrs	-	Targets	-	-	-	-	-

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Indicator	Units	Note	Type	Milestones				Target
				2014	2015	2016	2017	2023
			Actual	Not reported	Not reported			
SAIDI	%	8	Targets	-	-	-	-	-
			Actual	Not reported	Not reported			
SAIFI	%	9	Targets	-	-	-	-	-
			Actual	Not reported	Not reported			
CAIDI	%	10	Targets	-	-	-	-	-
			Actual	Not reported	Not reported			
Lost load per year, national	GWh	-	Targets	-	-	-	-	-
			Actual	Not reported	Not reported			
<b>Increased capacity at ERA</b>								
Avg. time for ERA to review generation license for small RE	Mos.	-	Targets	3	3	-	-	2
			Actual	1	1			
Number of REFIT tariff reviews done by ERA per year	#	-	Targets	1	1	-	-	1
			Actual	1	0			
<b>Increased number of Ugandan national jobs</b>								
Number of direct national jobs created by power plants	#	-	Targets	1,150	2,000	-	-	4200
			Actual	0	1,220			
Male	#	-	Targets	-	-	-	-	-
			Actual	0	1,124			
Female	#	-	Targets	-	-	-	-	-
			Actual	0	94			
Construction	#	-	Targets	-	-	-	-	-
			Actual	0	623			

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Indicator	Units	Note	Type	Milestones				Target
				2014	2015	2016	2017	2023
O&M	#	-	Targets	-	-	-	-	-
			Actual	0	111			
Skilled	#	-	Targets	-	-	-	-	-
			Actual	0	38			
Not skilled	#	-	Targets	-	-	-	-	-
			Actual	0	670			
<b>Deemed energy</b>								
Deemed energy for GET FiT power plants	KWh	-	Targets	-	-	-	-	-
			Actual	0	0			
Value of deemed energy obligations for GET FiT power plants	\$	-	Targets	-	-	-	-	-
			Actual	0	0			
<b>IMPACTS</b>								
<b>Lower carbon emissions</b>								
Grid-related CO <sub>2</sub> emissions per unit of electricity use	tCO <sub>2</sub> /MWh	-	Targets	0	0.06	-	-	0.09
			Actual	0.03	0			
<b>Increased access to electricity</b>								
Percent of population with access to electricity	%	-	Targets	16.6	17.5	-	-	26.4
			Actual	17	16			
<b>Increased electricity consumption</b>								
Electricity consumption per capita	KWh	-	Targets	63	66	-	-	105
			Actual	71	67			
<b>Transformational impact</b>								
Commercial financial institutions investing in RE	#	11	Targets	0	1	-	-	5
			Actual	0	3			

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Indicator	Units	Note	Type	Milestones				Target
				2014	2015	2016	2017	2023
Development permits and generation licenses issued for small RE	#	-	Targets	17	13	-	-	12
			Actual	17	6			
REFiT adjusted to be cost-reflective	%	11	Targets	100%	100%	-	-	1
			Actual	0.92	Not reported	0	0	0
Thermal power bought by UETCL	GWh	11	Targets	4.7	200	-	-	832
			Actual	8.8	57.74	0	0	0
Number of REFiT tariff reviews done by ERA per year	#	-	Targets	1	1	-	-	1
			Actual	1	0			

The notes mentioned in Table B.1 are described in Table B.2.

**Table B.2: Notes on Outcomes and Impacts**

Note Number	Note
1	“Supported by” means selected for support by GET FiT
2	The technologies supported by GET FiT are bagasse, biomass, hydropower, and solar
3	The sub regions are West, South West, North, East, and Central
4	Castalia has only counted projects reaching financial close as having finance mobilized. Castalia believes relying on financial close is a good approach, because it is a concrete, legal commitment to provide money. Before financial close, financing arrangements could change significantly
6	This percentage shows the current tariff as a percentage of ERA’s target for a cost-reflective tariff. The cost-reflected tariffs were calculated by ERA by using generalized financial models for different technologies. Some data were missing for 2015 as it was not yet provided by ERA
7	This reflects an improved investment environment because thermal power is expensive, and power from GET FiT RE should be cheaper
8	System Average Interruption Duration Index. See <a href="http://www.nmprc.state.nm.us/utilities/reliability-indices.html">http://www.nmprc.state.nm.us/utilities/reliability-indices.html</a>
9	System Average Interruption Frequency Index. See <a href="http://www.nmprc.state.nm.us/utilities/reliability-indices.html">http://www.nmprc.state.nm.us/utilities/reliability-indices.html</a>
10	Customer Average Interruption Duration Index. See <a href="http://www.nmprc.state.nm.us/utilities/reliability-indices.html">http://www.nmprc.state.nm.us/utilities/reliability-indices.html</a>
11	This indicator is repeated from above. Some indicators were repeated under the transformational heading to show that they are indicative of transformation, as well as fitting in other parts of the logframe
12	The Monitoring Consultant is waiting for the required data from UETCL.
13	Information was not found in publicly available sources.

Table B.3 shows GET FiT’s general progress in meeting outcome and impact targets.

**Table B.3: Progress Towards Outcome and Impact Goals, Summary**

Status	2014		2015	
	Count	Percent	Count	Percent
<b>Outcomes</b>				
Met or exceeded	6	35%	17	81%
Close	9	53%	1	5%
Not close	2	12%	3	14%
<b>Impacts</b>				
Met or exceeded	4	80%	2	40%
Close	1	20%	1	20%
Not close	0	0%	2	40%

At the end of 2015, GET FiT had met, or come close to meeting, about 60 percent of its outcome targets. The shortfall is largely due only one GET FiT-supported power plant having entered commercial operations. GET FiT has met, or come close to meeting, about 57 percent of its impact targets. The realization of outcomes and impacts will be discussed in more depth in the second report in this engagement.

## Appendix C: Trends on Investment in RE in Uganda

To understand if and how GET FiT changed the volume of private investment in RE, it is important to first establish the general trend in investment. The basic data are presented in Table C.1.

**Table C.1: Evolution of Installed Capacity from 2006 to 2016**

Year	RE Capacity with Some Private Investment (MW)	RE with Public Investment Only (MW)	Thermal Capacity (MW)	Total Capacity (MW)
2006	52	380	0	432
2007	52	380	0	432
2008	63	380	50	493
2009	76	380	50	506
2010	76	380	100	556
2011	108	380	100	588
2012	358	380	100	838
2013	367	380	100	847
2014	367	380	100	847
2015	387	380	100	867
2016	387	380	100	867

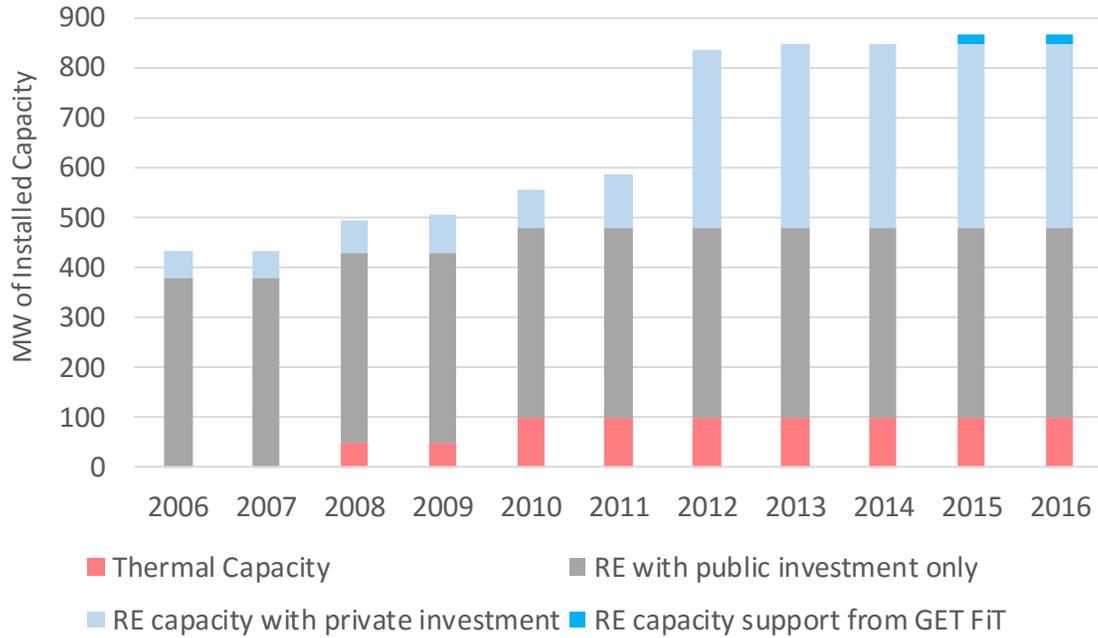
Source: Power Planning Committee Briefing Paper: Uganda's Electricity Demand and Supply Situation in Medium Term, received from UEGCL (2014). Websites of African Development Bank, European Investment Bank, Norfund, Private Infrastructure Development Group, World Bank, and some project developers.

Note: 2016 figures are only the month of April.

The data are presented visually in Figure C.1 to give a better sense of trends over time. Looking at installed capacity as a whole, the major event is clearly the commissioning of the Bujagali Dam in 2012. This is what accounts for the jump in installed capacity, from under 600MW, to over 800MW that year. This additional capacity ended power rationing in Uganda, and also allowed UETCL to largely cease running the expensive thermal capacity that had been installed in 2008 and 2010.

Cocerning the extent of renewable generation on the grid, the data show that in 2006 Uganda's generation capacity was 100 percent renewable. The addition of thermal generation to meet growing demand for power brought the percentage of renewables on the grid to a low of 82 percent in 2010—still much higher than most countries. In 2012, Bujagali brought the share of renewable capacity on the grid up to 88 percent.

**Figure C.1: Evolution of Installed Capacity from 2006 to 2016**



Source: Power Planning Committee Briefing Paper: Uganda’s Electricity Demand and Supply Situation in Medium Term, received from UEGCL (2014). Websites of African Development Bank, European Investment Bank, Norfund, Private Infrastructure Development Group, World Bank, and some project developers.

Looking at levels of private investment in renewable generation we can see that 12 percent of renewable generation capacity had some private investment in 2006. In 2012, the commissioning of Bujagali brought that to 49 percent.

Table C.2 shows the history of investment in RE from 2006 to the present.

Table C.2: Investment in RE in Uganda, 2006 to Present

Plant	Supported by GET FiT	Year of COD	Installed capacity (MW)	Technology	Size	Cost	o/w Public	o/w Private
Kakira (pre-GET FiT)		2006	52	Bagasse	Large	\$28,200,000	\$3,300,000	\$24,900,000
Mubuku III (Kasese Cobalt Co. Ltd.) *		2008	10.5	Hydro, small	Small	\$27,500,000	-	\$27,500,000
Mubuku II/ Bugoye		2009	13	Hydro, small	Small	\$65,700,000	\$8,900,000	\$56,800,000
Mpanga		2011	18	Hydro, small	Small	\$27,000,000	\$13,000,000	\$14,000,000
Ishasha/Kanungu		2011	6.5	Hydro, small	Small	\$14,000,000	\$0	\$14,000,000
Kinyara **		2011	7.5	Bagasse	Small	\$12,675,000	-	\$12,675,000
Bujagali		2012	250	Hydro, large	Large	\$798,000,000	\$532,000,000	\$266,000,000
<b>GET FiT is launched in 2013</b>								
Buseruka (Hydromax)		2013	9	Hydro, small	Small	\$16,318,452	\$5,471,890	\$10,846,501
Kakira (GET FiT)	✓	2015	20	Bagasse	Small	\$56,775,000	-	\$56,775,000

Note: Investments are included in the time series when a power plants is commissioned (reaches COD).

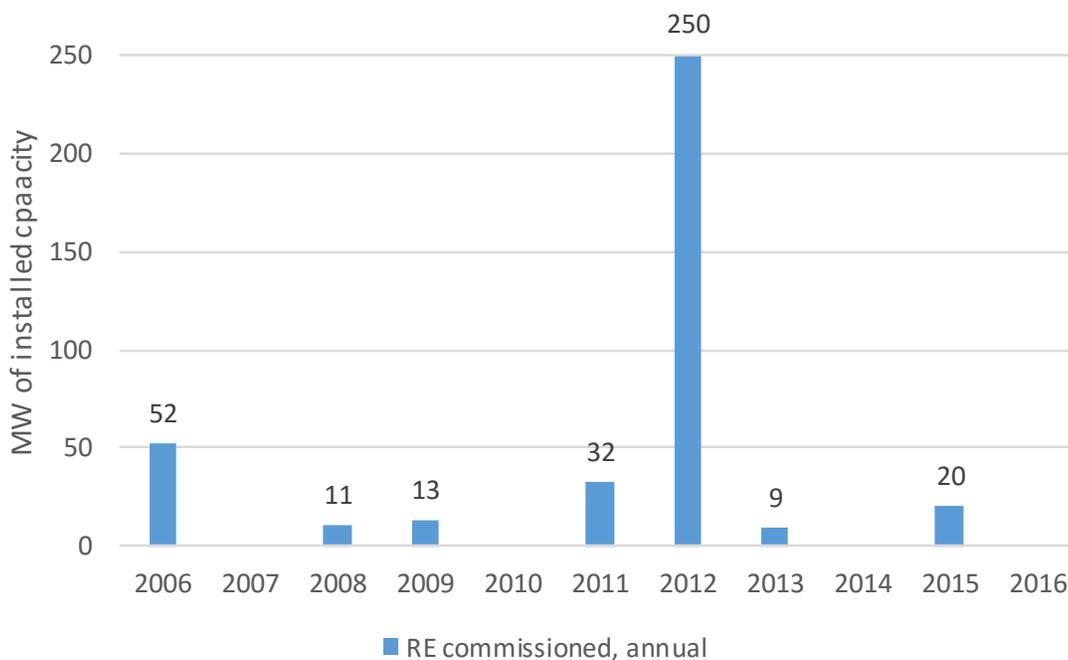
\* The total cost of Mubuku III was estimated by averaging the cost per MW across the other small hydropower projects in the table. It was assumed that the financing was all from private sources. The power plant is affiliated with a commercial commodity producer, and thus likely able to get private financing.

\*\* The total cost of Kinyara was estimated by averaging the cost per MW across the other bagasse projects. It was assumed that the financing was all from private sources. The power plant is affiliated with a commercial commodity producer, and thus likely able to get private financing.

Source: ERA, UEGCL, UETCL, developer websites.

The amount of renewable generation capacity reaching COD per year from 2006 to April 2016, is shown in Figure C.2.

**Figure C.2: RE Generation Capacity Reaching COD from 2006 to April 2016 (Annual)**



Note: Investments are included in the time series when a power plants is commissioned (reaches COD).

\* The total cost of Mubuku III was estimated by averaging the cost per MW across the other small hydropower projects in the table. It was assumed that the financing was all from private sources. The power plant is affiliated with a commercial commodity producer, and thus likely able to get private financing.

\*\* The total cost of Kinyara was estimated by averaging the cost per MW across the other bagasse projects. It was assumed that the financing was all from private sources. The power plant is affiliated with a commercial commodity producer, and thus likely able to get private financing.

Source: ERA, UEGCL, UETCL, developer websites.

The trend in commissioning RE has generally been lumpy from 2006 to the present. At most, one RE power plant reached COD in most years. The exception is 2011, in which three plants reached COD. The large spike in 2012 is entirely due to the commissioning of the Bujagali hydropower project.

Since 2013, two projects have been commissioned. The first was Buseruka, in 2013. This plant was largely developed before GET FiT began, and was not supported by GET FiT. Kakira, which was commissioned in 2015, was supported by GET FiT.

Given the time it takes to develop power plants, especially hydro plants, it is not surprising that few plants supported by GET FiT have yet been commissioned. It is likely that at least 11 power plants will come online in the next few years, as 11 GET FiT DFAs have been signed. GET FiT has selected a total of 17 power plants for support from the program, so another six power plants could be reasonably expected to come online later. Results will be reported and analyzed in the next two reports in this engagement.

## **Appendix D: Other Donor Programs in Uganda**

The other donor activities in Uganda—the sectors their share with GET FiT, and any actual overlap with GET FiT’s outputs—are shown in Table D.1. This information was found through reviewing documents and interviewing stakeholder at donor entities in Uganda. KfW made a strong effort to ensure that GET FiT’s did not overlap with other donors, as shown in the thorough list of donor projects in the business case for the interconnection component.

Table D.1: Other Donor Programs Related to Renewable Energy

Program	Donor(s)	Key Activities in RE Generation, Grid Improvements	Overlapping sub-sector with GET FiT	Actual Overlap with GET FiT	Dates
<b>Ayago Hydropower Project</b>	China EXIM Bank	<ul style="list-style-type: none"> <li>▪ Financial support for the Ayago hydropower plant (600MW)</li> <li>▪ Construction of transmission line</li> </ul>	Yes, it provides RE and transmission works.	No: <ul style="list-style-type: none"> <li>▪ Ayago is a large hydropower project, with 600MW of installed capacity</li> <li>▪ The grid works are not redundant with GET FiT's Interconnection Component</li> </ul>	2014-2016
<b>Uganda Private Power Generation (Bujagali) Project</b>	AfDB DEG, FMO, KfW, EIB, IFC, World Bank	<ul style="list-style-type: none"> <li>▪ Financial support for the Bujagali hydropower plant (250MW)</li> <li>▪ Financial support for power transmission lines for the plant</li> </ul>	Yes, it provides RE and transmission works.	No: <ul style="list-style-type: none"> <li>▪ Bujagali is a large hydropower project, with 250MW of installed capacity</li> <li>▪ The grid works are not redundant with GET FiT's Interconnection Component</li> </ul>	Commissioned in 2012
<b>Muzizi Hydropower Project</b>	AFD, KfW	<ul style="list-style-type: none"> <li>▪ Construction of 45MW Muzizi hydropower project</li> </ul>	Yes, it provides RE	No: <ul style="list-style-type: none"> <li>▪ The Muzizi project has 45MW of capacity, which makes it too large to be supported by GET FiT</li> </ul>	Under development
<b>Bujagali Interconnection</b>	AfDB, JICA	<ul style="list-style-type: none"> <li>▪ Upgrade Bujagali switchyard to 220kV</li> </ul>	Yes, it provides transmission works.	No: <ul style="list-style-type: none"> <li>▪ The grid works are not redundant with GET FiT's Interconnection Component</li> </ul>	2012-2015

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Program	Donor(s)	Key Activities in RE Generation, Grid Improvements	Overlapping sub-sector with GET FiT	Actual Overlap with GET FiT	Dates
<b>Open Sector Program</b>	Germany (KfW) and EU	<ul style="list-style-type: none"> <li>▪ Grid extension and densification</li> <li>▪ Technical cooperation with MEMD to complement grid extension</li> <li>▪ Construction of two hydropower plants (Nyagak I and III) in the West Nile region</li> <li>▪ Output-based aid for household connections</li> <li>▪ Support to UECCC (see separate entry)</li> </ul>	Yes, it provides grid extension.	No: <ul style="list-style-type: none"> <li>▪ The grid works are in the West Nile region, and do not connect to UETCL's grid</li> <li>▪ The power plants do not connect to UETCL's grid</li> </ul>	Overall term: 2015-ongoing
<b>Isimba Hydropower Project</b>	China EXIM Bank	<ul style="list-style-type: none"> <li>▪ Isimba hydropower plant (183MW)</li> <li>▪ Construction of transmission line</li> </ul>	Yes, it provides RE and transmission works.	No: <ul style="list-style-type: none"> <li>▪ Isimba is a large hydropower project, with 183MW of installed capacity</li> <li>▪ The grid works are not redundant with GET FiT's Interconnection Component</li> </ul>	2014-2016
<b>Improvements to Masaka-Mbarara Transmission Line</b>	AFD	<ul style="list-style-type: none"> <li>▪ Reinforcement of transmission line in Western Uganda</li> </ul>	Yes, it provides transmission works	No: <ul style="list-style-type: none"> <li>▪ The grid works are not redundant with GET FiT's Interconnection Component</li> </ul>	2014-2018

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Program	Donor(s)	Key Activities in RE Generation, Grid Improvements	Overlapping sub-sector with GET FiT	Actual Overlap with GET FiT	Dates
<b>Karuma Hydropower Project</b>	China EXIM Bank	<ul style="list-style-type: none"> <li>▪ Karuma hydropower plant (600MW)</li> <li>▪ Construction of transmission lines and substations</li> </ul>	Yes, it provides RE and transmission works	No: <ul style="list-style-type: none"> <li>▪ Karuma is a large hydropower project, with 600 of installed capacity</li> <li>▪ The grid works are not redundant with GET FiT's Interconnection Component</li> </ul>	2014-2017
<b>Lira-Gulu – Olwiyo-Nebbi-Arua Transmission Line</b>	World Bank, China Exim Bank	<ul style="list-style-type: none"> <li>▪ Construction of transmission line in northern Uganda</li> </ul>	Yes, it provides transmission works	No: <ul style="list-style-type: none"> <li>▪ The grid works are not redundant with GET FiT's Interconnection Component</li> </ul>	2016-2018
<b>Mirama-Kabale 132kV Transmission Line</b>	Islamic Development Bank	<ul style="list-style-type: none"> <li>▪ Extension of transmission grid in Kabale region to evacuate power from the proposed 33MW Kabale peat power plant</li> </ul>	Yes, it provides transmission works	No: <ul style="list-style-type: none"> <li>▪ The grid works are not redundant with GET FiT's Interconnection Component</li> </ul>	2014-2017
<b>Masaka - Mutukula-Mwanza</b>	East African Community	<ul style="list-style-type: none"> <li>▪ Construction of transmission line to connect with the Tanzanian</li> </ul>	Yes, it provides transmission works	No: <ul style="list-style-type: none"> <li>▪ The grid works are not redundant with GET FiT's Interconnection Component</li> </ul>	2015-2018
<b>Grid Improvements for Industrial Areas in Kampala</b>	China EXIM Bank	<ul style="list-style-type: none"> <li>▪ Extension of transmission grid, and construction of substations in Kampala and its suburbs</li> </ul>	Yes, it provides transmission works	No: <ul style="list-style-type: none"> <li>▪ The grid works are not redundant with GET FiT's Interconnection Component</li> </ul>	2014-2016

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Program	Donor(s)	Key Activities in RE Generation, Grid Improvements	Overlapping sub-sector with GET FiT	Actual Overlap with GET FiT	Dates
<b>Mbarara - Mirama-Birembo Transmission Line</b>	AfDB, JICA	<ul style="list-style-type: none"> <li>▪ Construction of transmission line to connect with the Rwandan grid</li> </ul>	Yes, it provides transmission works	No: <ul style="list-style-type: none"> <li>▪ The grid works are not redundant with GET FiT's Interconnection Component</li> </ul>	2013-2015 (planned)
<b>Queensway Substation</b>	JICA	<ul style="list-style-type: none"> <li>▪ Construction of Substation</li> </ul>	Yes, it provides transmission works	No: <ul style="list-style-type: none"> <li>▪ The grid works are not redundant with GET FiT's Interconnection Component</li> </ul>	2014-2016
<b>Bujagali-Tororo-Lessos Transmission Line</b>	AfDB, JICA	<ul style="list-style-type: none"> <li>▪ Construction of transmission line to connect with the Kenyan grid</li> </ul>	Yes, it provides transmission works	No: <ul style="list-style-type: none"> <li>▪ The grid works are not redundant with GET FiT's Interconnection Component</li> </ul>	2013-2015 (planned)
<b>Mbarara-Nkenda Transmission Line</b>	AfDB	<ul style="list-style-type: none"> <li>▪ Construction of transmission line in Western Uganda</li> </ul>	Yes, it provides transmission works	No: <ul style="list-style-type: none"> <li>▪ The grid works are not redundant with GET FiT's Interconnection Component</li> </ul>	2013-2015 (planned)
<b>Mputa Interconnection Project</b>	AFD, Norway	<ul style="list-style-type: none"> <li>▪ Transmission line improvements and substations in Western Uganda</li> </ul>	Yes, it provides transmission works.	No: <ul style="list-style-type: none"> <li>▪ The grid works are not redundant with GET FiT's Interconnection Component</li> </ul>	2014-2016

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Program	Donor(s)	Key Activities in RE Generation, Grid Improvements	Overlapping sub-sector with GET FiT	Actual Overlap with GET FiT	Dates
<b>Mirama-Kikagati-Nsongezi Transmission Line</b>	Norway	<ul style="list-style-type: none"> <li>▪ Transmission line to evacuate power from planned Kikagati and Nsongezi power plants</li> </ul>	Yes, it provides transmission works.	No: <ul style="list-style-type: none"> <li>▪ The grid works are not redundant with GET FiT's Interconnection Component</li> </ul>	2014-2018
<b>Mutundwe - Entebbe Transmission Line</b>	KfW	<ul style="list-style-type: none"> <li>▪ Extension of transmission grid to the Entebbe area</li> </ul>	Yes, it provides transmission works.	No: The grid works are not redundant with GET FiT's Interconnection Component	2014-2016
<b>Opuyo-Moroto Transmission Line</b>	Islamic Development Bank	<ul style="list-style-type: none"> <li>▪ Extension of the transmission grid to the Karamoja area</li> </ul>	Yes, it provides transmission works.	No: <ul style="list-style-type: none"> <li>▪ The grid works are not redundant with GET FiT's Interconnection Component</li> </ul>	2014-2017
<b>Tororo-Opuyo-Lira Transmission Line</b>	AfDB	<ul style="list-style-type: none"> <li>▪ Construction of transmission line in northern and eastern Uganda</li> </ul>	Yes, it provides transmission works.	No: The grid works are not redundant with GET FiT's Interconnection Component	2013-2015 (planned)
<b>Energizing Development (enDev)</b>	Germany (GIZ)	<ul style="list-style-type: none"> <li>▪ Off-grid solar</li> <li>▪ Grid connections</li> <li>▪ Improved stoves</li> </ul>	Yes, it provides RE	No: <ul style="list-style-type: none"> <li>▪ The program supports off-grid solar generation</li> </ul>	2005-2016
<b>Promotion of Renewable Energy and Energy Efficiency Programme (PREEEP)</b>	Germany (GIZ, Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety)	<ul style="list-style-type: none"> <li>▪ Support for energy efficiency</li> <li>▪ Off-grid solar</li> <li>▪ Grid connections</li> <li>▪ Improved stoves</li> </ul>	No	No: <ul style="list-style-type: none"> <li>▪ This project supports energy efficiency, not RE</li> </ul>	Overall term: 1999-2017

Program	Donor(s)	Key Activities in RE Generation, Grid Improvements	Overlapping sub-sector with GET FiT	Actual Overlap with GET FiT	Dates
<b>SREP Investments</b>	AfDB	<ul style="list-style-type: none"> <li>▪ Deployment of micro and mini-grids across islands of Lake Victoria</li> <li>▪ Prove wind energy's commercial viability in Uganda by:               <ul style="list-style-type: none"> <li>– Undertaking two feasibility studies for two projects</li> <li>– Constructing two pilot projects</li> <li>– Build technical capacity on wind energy at relevant national institutions</li> </ul> </li> <li>▪ Support decentralized renewables (mini-grids and solar net metering in mini-grids)</li> <li>▪ Develop and tender 130MW of geothermal generation to the private sector</li> </ul>	<p>Yes. It, provides potentially overlapping outputs:</p> <ul style="list-style-type: none"> <li>▪ Increased small-scale RE generation capacity</li> <li>▪ Increased small-scale RE power production</li> </ul>	<p>No:</p> <ul style="list-style-type: none"> <li>▪ This program supports wind and geothermal, two technologies not supported by GET FiT</li> </ul>	<p>Submission of the SREP Project Appraisal Document is expected in the last quarter of 2016</p>

Program	Donor(s)	Key Activities in RE Generation, Grid Improvements	Overlapping sub-sector with GET FiT	Actual Overlap with GET FiT	Dates
<b>Electricity Sector Development Project</b>	World Bank	<ul style="list-style-type: none"> <li>▪ Replacing old and unreliable transmission lines</li> <li>▪ TA to UETCL to prepare segments of expansion/reinforcement of transmission network</li> </ul>	Yes, the program strengthens transmission.	No: <ul style="list-style-type: none"> <li>▪ The grid works are not redundant with GET FiT's Interconnection Component</li> </ul>	<ul style="list-style-type: none"> <li>▪ World Bank Project Appraisal Document submitted on 31 May 2011</li> <li>▪ Procurement bidding document ready in May 2011</li> </ul>
<b>Energy for Rural Transformation Program</b>	World Bank	<ul style="list-style-type: none"> <li>▪ Grid extension (21 projects, 1800km)</li> <li>▪ Grid intensification</li> <li>▪ Increasing household connections from existing lines</li> <li>▪ Off-grid energy access</li> <li>▪ Institutional strengthening for MEMD and ERA: regulatory enhancement studies and capacity development for rural access efforts</li> </ul>	No	<ul style="list-style-type: none"> <li>▪ The grid works do not overlap with GET FiT's Interconnection Component</li> </ul>	World Bank Project Appraisal Document submitted on 14 May 2015

Program	Donor(s)	Key Activities in RE Generation, Grid Improvements	Overlapping sub-sector with GET FiT	Actual Overlap with GET FiT	Dates
<b>Kasese District Renewable Energy Strategy</b>	WWF (World Wildlife Federation)	<ul style="list-style-type: none"> <li>▪ Formed plan for capacity building and the coordination and promotion of local RE resources including:               <ul style="list-style-type: none"> <li>– Biomass</li> <li>– Waste-to-Energy Conversion</li> <li>– Solar</li> </ul> </li> </ul>	No	<ul style="list-style-type: none"> <li>▪ This project provided a plan for the Kasese District which includes small RE, but does not directly support the implementation of generation projects.</li> </ul>	Implementation Term: 2013-2020
<b>Uganda Energy Credit Capitalization Corporation (UECCC)</b>	GIZ, Government of Netherlands, KfW, World Bank	<ul style="list-style-type: none"> <li>▪ Credit enhancements instruments for:</li> <li>▪ Loans to households and businesses to buy small solar systems</li> <li>▪ Loans to households and businesses to pay for electricity connections</li> <li>▪ TA and advisory services to IPPs and financial services for RE projects</li> </ul>	Yes, the program supports projects that should increase small-scale RE capacity and generation	<p>No:</p> <ul style="list-style-type: none"> <li>▪ Though UECCC also supports grid-scale RE, it provides TA and advisory services which are complementary with GET FiT, not redundant (through KfW)</li> <li>▪ One project that was in GET FiT received support for advisory services, but had its support revoked by GET FiT (through KfW)</li> <li>▪ The credit enhancements are not for services supported by GET FiT</li> </ul>	September 2011 to present

Program	Donor(s)	Key Activities in RE Generation, Grid Improvements	Overlapping sub-sector with GET FiT	Actual Overlap with GET FiT	Dates
<b>Uganda Grid Expansion and Reinforcement Project (GERP)</b>	World Bank	<ul style="list-style-type: none"> <li>▪ Finance interconnection of isolated systems to the national grid</li> <li>▪ Finance the rehabilitation and upgrade of existing transmission infrastructure</li> <li>▪ TA for UETCL in the implementation of transmission projects</li> </ul>	Yes, the program provides transmission works	The World Bank’s transmission works are not redundant with GET FiT’s interconnection component.	Board Approval Date was 20 Oct 2015

Note: According to the GET FiT Annual Report 2

Sources: African Development Bank Joint Assistance Strategy, GET FiT Annual Report 2015, Interviews by Castalia World Bank PAD for Uganda Electricity Sector Development, PREEEP Project Description, World Bank official blog ([blogs.worldbank.org](http://blogs.worldbank.org)), World Bank PAD for Uganda Rural Electrification, World Bank PID for Northern Power Transmission Line in Uganda, World Bank PAD for Uganda Private Power Generation (Bujagali) Project, WWF Kasese District Plan Report, UECCC website, email with KfW

## Appendix E: Preliminary Findings on Questions to be Answered in Future Reports

Some questions in this assignment cannot be answered in this report. These questions will be answered later, in the 2017 Second Performance Review and Mid-Term Evaluation Report, and the 2019 Third Performance Review and End-Term Evaluation Report.

These cannot be meaningfully answered now because GET FiT has not progressed far enough for them to be analyzed—more power plants have to come online before the question should be answered. (only one power plant is online as of now).

However, some baseline data were collected, or tentative findings identified, for these questions. Baseline data will be used in the future to make comparisons against pre-GET FiT trends and identify changes. Tentative findings will help guidance full analysis in the alter reports.

This section presents baselining or tentative findings for these questions:

- EQ1c: What is GET FiT's impacts?
- EQ3: What evidence is there that GET FiT has had transformational impact?
- EQ4: How likely is GET FiT to be sustainable?

### E.1 EQ1c: What is GET FiT's Impact?

According to the OECD DAC Evaluation Criteria, impacts are the positive and negative changes produced by a development intervention, directly or indirectly, intended or unintended.<sup>79</sup> Impacts are to be studied in depth in the subsequent Performance Review and Evaluation Reports, in 2017 and 2019. GET FiT's impacts result from power plants being operational. Given that only one power plant is operational as for April 2016, it is too early to measure much in the way of the impacts.

Current baseline data on impact indicators from the logframe is shown in Table E.1. These data do not reflect any analysis of attribution. Attribution of impacts will be studied in the subsequent reports.

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<sup>79</sup> <http://www.oecd.org/dac/evaluation/daccriteriaforevaluatingdevelopmentassistance.htm>

**Table E.1: Impact Indicators**

Indicator	Units	Notes	Type	Milestones				Target
				2014	2015	2016	2017	
<b>IMPACTS</b>								
<b>Lower carbon emissions</b>								
Grid-related CO <sub>2</sub> emissions per unit of electricity use	tCO <sub>2</sub> /MWh	-	Targets	0	0.06	-	-	0.09
			Actual	0.03	0			
<b>Increased access to electricity</b>								
Percent of population with access to electricity	%	-	Targets	16.6	17.5	-	-	26.4
			Actual	17	16			
<b>Increased electricity consumption</b>								
Electricity consumption per capita	KWh	-	Targets	63	66	-	-	105
			Actual	71	67			

Source: Logframe from monitoring consultant., Castalia calculations.

Note: Green highlights mean a goal was met or exceed. Yellow highlights mean actual results came within 80 percent of the goal. Red highlights mean actual results were less than 80 percent of the goal. Grey highlights mean no goal was specified. In the case of carbon emissions in 2014, the actual data was coded yellow by the evaluator as a qualitative judgment. It is not mathematically possible to calculate the percentage deviation from a target of

Grid-related carbon emissions in Uganda have been negligible in recent years. However, this is due to the commissioning of Bujagali, not to GET FiT. Indeed, with the current surplus hydro-generation capacity from plant that pre-date GET FiT, and additional large hydro plant scheduled to come on-line in the near future, there is a risk that GET FiT will not in fact reduce carbon emissions in Uganda's energy sector. It is also possible that the GET FiT plants could help avoid additional thermal power generation in the future, if other large hydropower projects are delayed (especially Karuma). These emission scenarios will be explored in the next evaluation through development of 'with GET FiT' (actual) and 'without GET FiT' (counterfactual) analyses of Uganda's total grid emissions.

The evaluators also looked for unintended benefits, behind the program's expected impacts.<sup>80</sup> One potential unintended benefit of the GET FiT program was found during field visits to the Sindila and Siti power plants. On-site construction contractors said that roads leading to the power plants had been improved to allow transport of materials and equipment for construction, and would be further improved during construction.

The evaluators observed that roads leading to power plants were of higher quality than they would have generally expected in such areas. The construction contractors told the evaluators that local people were benefitting by using the improved roads. This will have to be verified in the future. Households and SMEs were not asked about this in the surveys, as this effect had not been anticipated when the surveys were designed. We proposed that for the Second Performance Review, and Final Evaluation Report, we add survey questions on how the roads have impacted their daily life and business activity.

## **E.2 EQ3: What Evidence is There That GET FiT Has Had Transformational impact?**

The Terms of Reference for this engagement define transformation in general as:

*“Change that catalyzes further changes, enabling either a shift from one state to another (e.g. from conventional to lower carbon or more climate-resilient patterns of development) or faster change (e.g. speeding progress or cutting the rate of deforestation)”.*

Transformational change is defined for this report as changing the market for renewable energy generation in Uganda in such a way that private investment in small scale renewable energy projects occurs without support from GET FiT in the future, in significantly higher volumes than would have occurred were it not for GET FiT. For transformation to be judged to have taken place, then, we must see significant investment in small scale renewables that are not supported by GET FiT, and we must be able to attribute much of that investment to things that were set in motion by GET FiT.

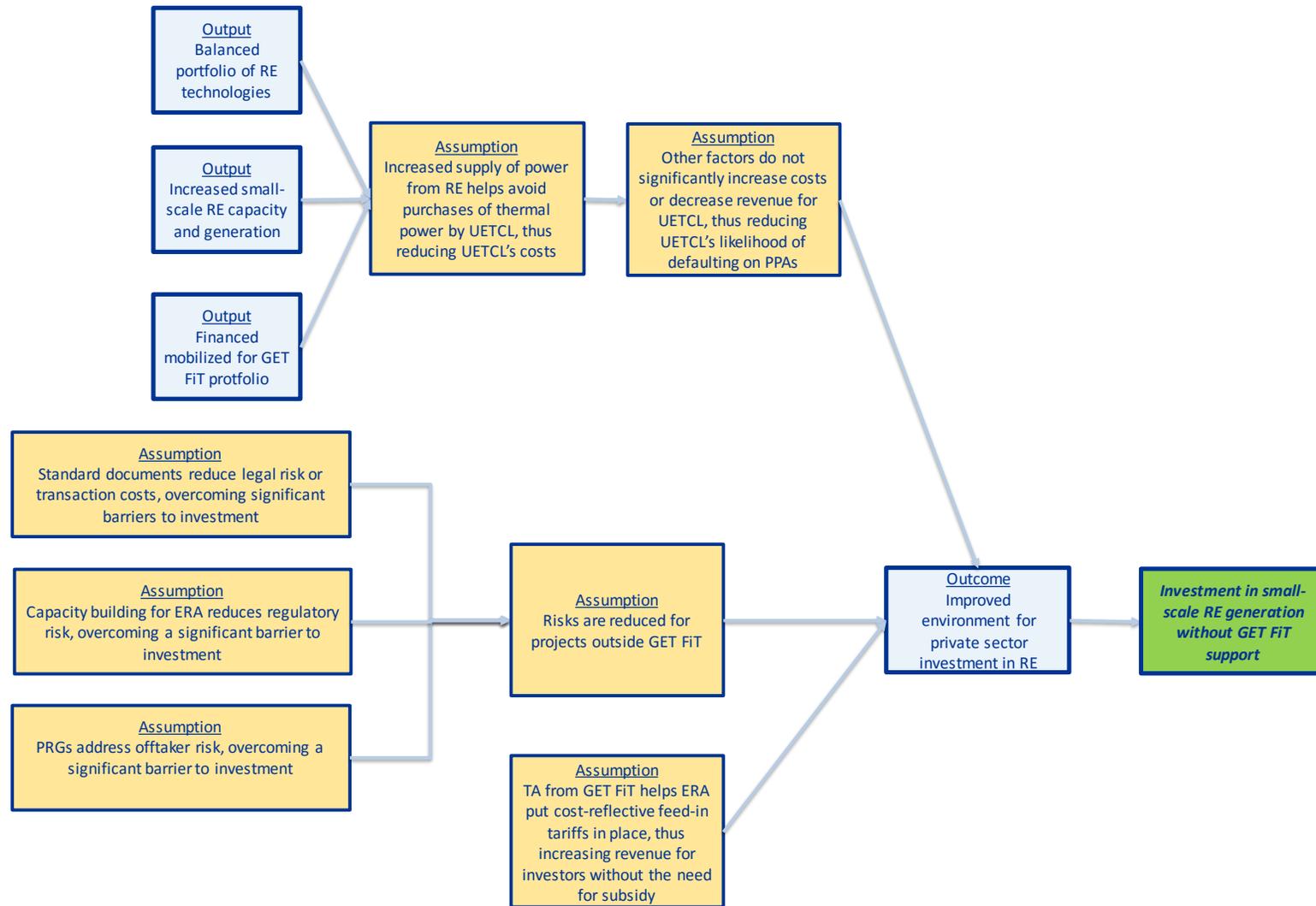
The International Climate Fund's Key Performance Indicator 15 (ICF KPI 15) measures factors likely to support transformational change, such as capacity building, innovation, leverage, incentives for other to act, replicability, and being at a large scale.<sup>81</sup> Drawing on these typical drivers of transformation, the hypothesized causal pathway for transformational change is shown in Figure E.1.

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<sup>80</sup> The OECD DAC Evaluation Criteria ask for intended and unintended impacts to be considered.

<sup>81</sup> The International Climate Fund (ICF) is providing some of the UK Government's funding for GET FiT. ICF was set up by the UK Government to help developing countries combat climate change and reduce poverty. [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/48217/3389-uk-international-climate-fund-brochure.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/48217/3389-uk-international-climate-fund-brochure.pdf)

Figure E.1: Causal Pathway from Outputs to Improved Environment for Private Sector Investment in RE in Uganda



We cannot yet observe transformational change. Since the GET FiT program launched in 2013, only one RE power plant has reached COD without support from the program. That power plant, Buseruka, was largely developed before GET FiT launched, and could not have benefited from any transformational change induced by the program.<sup>82</sup>

There are signs that development activity in small scale renewable generation has picked up since GET FiT started. As already discussed, an ideal analysis of trends in licensing would include data for years before 2012. Nonetheless, it is likely that GET FiT’s pace of licensing has generally accelerated.

There are also signs that some of the hypothesized causal pathways are working. Three developers in GET FiT are trying to use the GET FiT standard PPA for projects outside the program.<sup>83</sup> If these projects proceed with that PPA, or a slightly modified one, then some transformation may have been realized. Ziria Tibalwa, Director of Technical Regulation at ERA, said that the capacity building

*“has not only enhanced our internal capacity to review permits and license application but has increased ERA’s visibility nationally, regionally and internationally”.*

There are other signs that point to a risk that transformational change will not be realized. Perhaps the most serious is that Uganda may have a surplus of generation capacity for some time to come<sup>84</sup>. The market for renewable energy generation can only be transformed if there is a continued demand for such generation. If over-capacity persists, it would not be rational for UETCL to continue to procure small scale renewable generation. Indeed, to do so would increase the total cost of supply, or worsen UETCL’s financial position, or both.

### Independent evaluation of ICK KPI 15

Castalia has prepared preliminary comments on ICF KPI 15, in Table E.2. This provides an independent view on progress against KPI 15. This may help DECC in its official determination of progress against KPI 15.

**Table E.2: Independent Analysis of KPI 15**

Element	Approach	Comment
<p><b>Replicable:</b> HMG-supported activities are being replicated by others.</p>	<ul style="list-style-type: none"> <li>▪ Check if the GET FiT mechanisms are continued in Uganda without donor support</li> <li>▪ Check if other countries adopt similar mechanisms, and if so, if their decision was influenced by their knowledge of the Uganda program</li> </ul>	<ul style="list-style-type: none"> <li>▪ It is too early to check if the mechanisms persist without donor support</li> <li>▪ We will examine the implementation of GET FiT programs in other countries (like Zambia), once those programs commence operations. It seems likely that GET FiT Zambia will duplicate, and improve on, aspects of GET FiT (according to Kathrin Kaestle at KfW).</li> </ul>

<sup>82</sup> Buseruka as commissioned in 2013.

<sup>83</sup> The developers are Developers 2, 5, and 11.

<sup>84</sup> Uganda 10-Year Energy and Power Balance Projects”, draft report written by Multiconsult for Norfund.

Element	Approach	Comment
<p><b>Leverage:</b> HMG-supported activities are creating the incentives for others to act on climate change.</p>	<ul style="list-style-type: none"> <li>▪ Apportion private and public investments across donors</li> </ul>	<ul style="list-style-type: none"> <li>▪ As of, US\$57 million of private investment can be attributed to GET FiT donors. This is analyzed in Section 5.3.1.</li> </ul>
<p><b>Innovative:</b> HMG-supported activities are encouraging innovation and testing new approaches.</p>	<ul style="list-style-type: none"> <li>▪ We made a qualitative assessment of the innovation of GET FiT, based on our knowledge of, and experience in, policy programs to stimulate RE generation, testing whether the GET FiT mechanisms has been previously used and elsewhere, and to what extent</li> </ul>	<ul style="list-style-type: none"> <li>▪ GET FiT seems like an innovative program, because it tackles all the major barriers to RE investment at once. It also has an innovative mechanism for funding works (results-based tariff premium). In the evaluator’s experience, most programs tackle only some. This is discussed in Section 7.1</li> </ul>
<p><b>At-scale:</b> Ideally quantitative assessment of resources mobilized relative to the magnitude assessed as necessary to affect the desired change</p>	<ul style="list-style-type: none"> <li>▪ To assess whether GET FiT was at scale locally in Uganda, we will compare the size of GET FiT relative to Uganda total generation capacity, and need for new capacity.</li> </ul>	<ul style="list-style-type: none"> <li>▪ As of now, only one power plant is operational. Whether GET FiT was appropriately scaled will be analyzed in future reports as more power plants become operational.</li> </ul>
<p><b>Capacity:</b> ICF-supported activities enhance local capacity to act on climate change</p>	<ul style="list-style-type: none"> <li>▪ To assess whether GET FiT built capacity we will use the findings from the attribution analysis for the capacity building interventions. This is discussed in Section 5.2.3.</li> </ul>	<ul style="list-style-type: none"> <li>▪ It seems likely that GET FiT has enhanced capacity at ERA in a way that facilitates RE investment. This is discussed in Section 5.2.</li> </ul>

Source: ICF Scorecard for KPI 15.

Note: HMG means “Her Majesty’s Government”, referring to the British Government, which runs the International Climate Fund (ICF).

### **E.3 EQ4: How Likely is GET FiT to Be Sustainable?**

According to the OECD DAC Evaluation Criteria, sustainability is concerned with measuring whether the benefits of an activity are likely to continue after donor funding has been withdrawn.<sup>85</sup>

This question will focus on whether the generation plants developed with GET FiT's support are still providing energy as expected, if they remain in private ownership, and are being adequately maintained.

This question will be explored in-depth in future reports. As of now, only one power plant is operational, and has been operating for less than a year. In the future, sustainability will be analyzed by:

- Verifying sales of power with UETCL
- Verifying ownership of power plants with ERA and developers
- Verifying the availability of power plants with UETCL and ERA.

Sustainability will be analyzed to the extent possible in the remaining two reports in this engagement (in 2017 and 2019). Many power plants in the GET FiT portfolio may not come online after the last report is written. In that case, sustainability may be analyzed best as part of another engagement, after 2019.

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<sup>85</sup> <http://www.oecd.org/dac/evaluation/daccriteriaforevaluatingdevelopmentassistance.htm>

## **Appendix F: Approaches to Individual Questions**

Table F.1 shows the analytical techniques that were used to address the questions that this report answers. The application of those techniques is described in the later appendix sections.

Table F.1: Approaches to Individual Questions

#	Question	Desk research	Interviews (qual.)	Surveys (quant.)	Contribution analysis	Process Tracing	Realist analysis	Counter-factual	VfM
EQ1	To what extent has GET FiT led to a change in the volume of private investment in RE projects in Uganda? What have been the main drivers?	✓	✓		✓	✓	✓		
EQ1a	To what extent has GET FiT addressed the barriers to private sector investment in RE projects in Uganda? (such as risk, transaction costs, information availability, lack of uniform PPAs?)	✓	✓		✓	✓	✓		
EQ1b	To what extent has change occurred in the volume of private investment in RE, and what proportion of this change has occurred as a result of GET FiT?	✓	✓		✓	✓	✓		
EQ1c *	What is GET FiT's impact?	✓	✓	✓	✓	✓	✓	✓	

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#	Question	Desk research	Interviews (qual.)	Surveys (quant.)	Contribution analysis	Process Tracing	Realist analysis	Counter-factual	VfM
EQ2*	What has been the level of economic benefit (to Uganda) of different RE technologies (value for money) specifically funded by GET FiT?	✓	✓	✓	✓	✓	✓	✓	✓
EQ2a*	To what extent have the various GET FiT RE technologies led to an increase in jobs for Ugandan Nationals?	✓	✓		✓	✓	✓	✓	
EQ2b *	To what extent have the various GET FiT RE technologies led to an increase in economic benefit for Uganda?	✓	✓		✓	✓	✓	✓	
EQ2c*	Which GET FiT RE technologies have provided better value for money? What have been the drivers?	✓	✓		✓	✓	✓	✓	✓
EQ3 *	What evidence is there that GET FiT has had transformational impact?	✓	✓		✓	✓	✓		
EQ4 *	How likely is GET FiT to be sustainable?	✓	✓		✓	✓	✓		
EQ5	Was GET FiT relevant for Uganda?	✓	✓						

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#	Question	Desk research	Interviews (qual.)	Surveys (quant.)	Contribution analysis	Process Tracing	Realist analysis	Counter-factual	VfM
PRQ1	To what extent have the output targets and milestones been met?	✓							
PRQ1a	What was the level of attribution of change to each of the donors of the program?	✓			✓				
PRQ1b	To what extent have the outcome and impact targets and milestones been met?	✓							
PRQ2	What have been the key challenges and opportunities in program delivery?	✓	✓		✓	✓	✓		
PRQ2a	How have they impacted on the performance of the program?	✓	✓		✓	✓	✓		
PRQ2b	What measures have been taken to mitigate challenges and take advantage of opportunities?	✓	✓		✓	✓	✓		
PRQ3	What other programs are being implemented that could have led to the same outputs?	✓	✓						
PRQ4	How has program delivery been affected by influences outside of its control?	✓	✓		✓	✓	✓		

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#	Question	Desk research	Interviews (qual.)	Surveys (quant.)	Contribution analysis	Process Tracing	Realist analysis	Counter-factual	VfM
PRQ5	What systems and processes are in place to effectively deliver the intended results and learn lessons?	✓	✓						
PRQ6	Was GET FiT an appropriate model to deliver the intended outcomes?	✓	✓		✓	✓	✓		✓
PRQ6a	Did the GET FiT tendering arrangements work and what lessons can be learnt from them?	✓	✓		✓	✓	✓		
PRQ6b	Was the choice and arrangements with the implementation consultant appropriate (again lessons for the future)?	✓	✓						
PRQ7	What lessons can be learned from the interaction between the World Bank guarantee insurance and the GET FiT program?	✓	✓		✓	✓	✓		

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#	Question	Desk research	Interviews (qual.)	Surveys (quant.)	Contribution analysis	Process Tracing	Realist analysis	Counter-factual	VfM
PRQ7a	What lessons can be learned from the World Bank guarantee issuance and impact on cost of capital and which products required guarantees and which did not etc.	✓	✓		✓	✓	✓		
PRQ7b	Are the World Bank guarantees being issued faster and more frequently in a) GET FiT b) outside of GET FiT?	✓	✓						
PRQ7c	How many guarantees have been issued to small renewable energy projects outside of GET FiT e.g. in other parts of Africa/Asia.	✓	✓						
PRQ7d	Has the World Bank replicated the “no objection” and packaging arrangement anywhere else?	✓	✓						

## Appendix G: Technical Approach to Selecting Interviewees

Interviews with a wide range of stakeholders were one of the most important sources of evidence for this evaluation. This section sets out how we selected the stakeholders to interview. Note that this was not a sampling strategy in the normal sense of trying to select a small number of interviewees that would fairly represent the responses of a much larger universe of potential interviewees. In many cases we spoke to all, or almost all, the stakeholders in any particular stakeholder group.

Evidence from the interviews was largely used to inform analysis of attribution (see 0). Interviews responses also informed Performance Review Questions, as described in Appendix I.

We sought the views of the following groups of stakeholders as a key part of our analysis of attribution:

1. Developers, equity investors, and lenders with projects that **were selected** for support from GET FiT.
2. Developers of projects that applied for support from GET FiT, but were **not selected** by GET FiT.<sup>86</sup> These stakeholders provided some insight into whether GET FiT was necessary, by commenting on whether and why their projects could have proceeded without GET FiT. It should be noted that many projects that were not selected for support had developers who had other projects that were selected for support.

We did not interview investors or lenders for projects that were not selected by GET FiT. The application process is managed by the developers. It is unlikely that investors would have many views that are not hearsay from developers.

3. Developers, equity investors, and lenders that **did not develop or finance, projects that applied to GET FiT**, but would have been reasonably expected to do so.
4. Staff from **ERA**, the Ugandan electricity regulator.

Staff from other GoU and energy sector agencies, KfW, the GET FiT Secretariat, and donor agencies were also interviewed to understand how GET FiT effected investment in RE, and gain general knowledge of the Ugandan energy sector.

A log showing all interviews is included at the end of this section, in Table G.5.

### Selection of developers, investors, and lenders in GET FiT projects to interview

We aimed to interview all developers, investors, and lenders with projects that are supported by GET FiT (That is, a sample which is 100 percent of population being sampled). The sample frame (targeted sample), and actual sample, are shown in Table G.1

**Table G.1: Sample Frame and Sample**

Stakeholder	Frame		Sample	
	Number of Stakeholders	Number of Projects	Number of Stakeholders	Number of Projects
Developers	12	17	12	17
Equity Investors	2	4	1	2

<sup>86</sup> These stakeholders' opinions were used occasionally to inform analysis of attribution (see the discussion of some losing bidders in 0). The evaluators had hoped to make more use of interview with these stakeholders, but these interviews did not prove very useful.

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Lenders		8		16		5		13
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Note: The number of stakeholders in each category and the number of projects do match up. This is because some projects had different sets of stakeholder types (for sample, some projects had equity investors, but most did not). Many stakeholders had multiple projects (for example, one lender provided loans to six GET FiT-supported projects).

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The sample frame was created from GET FiT program records. We then contacted interviewees by phone or email to schedule an interview. When possible, we met them in person. Otherwise, we talked with them over the phone. We contacted developers as many times as required to schedule an interview. One developer was emailed 10 times, and called twice, before agreeing to schedule an interview. We contacted the lenders and investors three times, and then stopped if they did not respond.

The sample is shown in Table G.2. Each project has one developer. However, some projects have more than one or lender. Some stakeholders appear multiple times because they are supporting multiple projects. Stakeholders who were interviewed are in cells highlighted in blue. Those who were not interviewed are in cells with a white background. If a project did not have an equity investor or a lender, a dash is shown.

**Table G.2: Sample for Stakeholders with Projects in GET FiT**

Project	Developer	Equity Investor	Lender
Kakira	Kakira Sugar	-	Stanbic, Standard Chartered, Citibank
Kikagati	Berkeley AREF	Norfund	-
Kyambura*	Ziba	-	Proparco
Lubilia	Frontier	-	FMO
Muvumbe	Vidullanka	-	Hatton National Bank, Bank of Ceylon
Ndugutu	KMRI	Lereko Metier	OPIC
Nkusi	PA Technical Services	-	PTA Bank
Nyamagasani I	Frontier	-	Stanbic
Nyamagasani II	Frontier	-	Stanbic
Nyamwamba	SAEMS	-	FMO
Rwimi	Eco Power	Norfund	BIO
Sindila	KMRI	Lereko Metier	OPIC
Siti I	Frontier	-	FMO
Siti II	Frontier	-	FMO
Soroti	Access	-	FMO
Tororo	Simba	-	FMO
Waki	Hydromax	-	PTA Bank

Note: Some stakeholders appear multiple times because they are supporting multiple projects. For the two projects which had multiple lenders, the lenders were treated as one entity in the above table. This is because lenders tend to have very similar financial concerns, and would likely share similar opinions on a given project.

\*Note: The GET FiT Secretariat said that Proparco was lending to Kyambura. However, in an interview Proparco indicated that it had been planning to lend, but is not at present as some problems have to be solved. Proparco's opinions on Kyambura were not discussed in detail, so the interview is not counted in this table.

### Sample for projects that were not selected for GET FiT

We aimed to interview all developers of projects that were not selected by GET FiT (a 100 percent sampling approach again). We wanted to speak with developers of unselected projects across all the GET FiT technologies, to see if the technologies faced similar or different challenges.

These interviewees were identified through GET FiT program records. The sampling frame is the group of developers of projects that applied for support from GET FiT, but were not selected.

We contacted interviewees by phone or email to schedule an interview. When possible, we met them in person. Otherwise, we talked with them over the phone. We contacted each potential interviewee three times to request an interview, and then stopped.

The sample is shown in Table G.3. We spoke to seven of 12 unsuccessful bidders. Of those seven, six were international, and the other was local. Five of the developers were highly experienced. One had medium experience, and the other had low experience.<sup>87</sup>

Size in terms of value of investments was not used to classify developers, as previously proposed in the Inception Report. The evaluators at first considered size to be a proxy for capacity, but found this not to be the case. For example, one of the developers with a GET FiT-supported project, KMRI, had two small RE projects (one in Sri Lanka, and one in Tanzania). This seems small when compared to a large multinational corporation like Enel, which had a losing bid, and is a major utility in Europe that also operates in the United States, Africa, the Middle East, and Latin America. However, KMRI's team is highly experienced. The team includes Jigar Shah, who previously founded one of the largest independent power companies in the United States, which was sold for US\$400 million in 2009.

Also, comparable data on size of investments was not easily available. Many developers were also reluctant to disclose such financial details.

**Table G.3: Developers Were Not Selected by GET FiT**

Developer	Technology	Interview Completed	Location	Experience**
CPCS Development International (CDIL)	Hydropower	Yes	International	Medium
Elegtra	Solar	Yes	International	High
Enel Green Power	Solar	Yes	International	High
ESNA Power Ltd. and Engineering Consultants Ltd (ENGCL/Akbar Tea)	Hydropower	Yes	International	High

<sup>87</sup> Experience levels were defined as follows: High= developed two or more operating projects. Medium=developed one operating project. Low=developed no operating projects.

Developer	Technology	Interview Completed	Location	Experience**
Network	Hydropower	Yes	Local	Low
Scatec Solar	Solar	Yes	International	High
Ujaas Energy	Solar	Yes	International	High
Energy Services Limited	Solar	No	Local	Not known
Industrial Promotion Services	Solar	No	International	Not known
Savimaxx	Hydropower	No	Local	Not known
Solaire Direct Southern Africa (PTY) LTD // Biotherm Energy // Vina Company	Solar	No	International	Not known
Uganda Ply	Hydropower	No	Local	Not known

\*Note: By “local” we mean having operations in Uganda. A bank headquartered in Kenya with operations in Uganda would be local, while a bank based in South Africa that lends in various countries in Africa, but does not have operations in Uganda, would be international.

\*\*Note: Experience was confirmed during interviews. Then, developers who were not interviewed do not have an experience rating.

### **Sampling plan for RE stakeholders that did not apply to GET FiT**

We planned to interview RE stakeholders you would have been expected to apply for GET FiT, but did not, across a selection of certain characteristics. We aimed to interview nine RE stakeholders that did not apply to GET FiT, with representation across the following characteristics:

- Having at least one previously active project in Uganda, or actively pursuing projects there; and not having any prior experience in Uganda
- A mix of developers and equity investors, and lenders
- A mix of international and Ugandan entities.

The sampling frame was a list of developers, equity investors, and lenders in a propriety database of investors in RE maintained by Castalia. There are few investors in RE in Africa, relative to more developed markets. The sampling frame consisted of eight developers and one lender, all of whom were international.

The target interviewees were chosen by identifying organizations in the database that had previously pursued projects in Uganda, or elsewhere in East Africa. Using contact information in the database we contacted interviewees by phone or email to schedule an interview. Interviews were conducted over the phone.

The frame and sample are shown in Table G.4. The frame is the list of nine organizations in the leftmost column. Four developers or investors were interviewed. We think that many of organizations in the frame did not respond to interview requests because they had no direct connection to GET FiT. Of those who were interviewed, all were international, and none were lenders. Only one interviewee was potentially interested in pursuing projects with 20MW capacity or less—the other three that interviewees had a policy of only pursuing larger projects.

**Table G.4: Sampling Plan for RE Stakeholders That Did Not Apply to GET FiT**

Organization	Interviewed	Active in Uganda	International	Pursues projects of 20MW or smaller*	Type	
					Developer or equity investor	Lender
Adenium Capital	✓		✓		✓	
African Infrastructure Investment Fund (AIIM)	✓		✓	✓	✓	
Aldwych	✓		✓		✓	
Google	✓		✓		✓	
Actis		✓	✓		✓	
Centum			✓		✓	
Investment in Africa Holdings			✓		✓	
Kaboni		✓	✓		✓	
Standard Chartered		✓	✓			✓

\*Note: Respondents were asked about the size of projects in interviews. If an organization was not interviewed, then this information was not available.

A log showing all completed interviews is in Table G.5.

**Table G.5: Interview Log**

Organization Name	Category	Name	Date Completed
Access	Developer- in GET FiT	Vahid Foruthi	Monday 7 December 2015
Adenium Capital	Investor- not applied	Alp Karli	Wednesday 30 March 2016
African Infrastructure Investment Fund (AIIM)	Investor- not applied	Ulisha Singh	Thursday 24 March 2016
Agut	Consultant to GET FiT	Aurélien Agut	Tuesday 12 January 2016
Aldwych International Ltd.	Developer- not applied	Crispin Holliday	Friday 18 March 2016
Berkeley Energy (manages AREF)	Developer- in GET FiT	Nicholas Tatrallyay	Thursday 17 March 2016
BIO (Belgian Investment Company for Developing Countries)	Lender- in GET FiT	Anne Beger	Tuesday 12 January 2016
CPCS Development International (CDIL)	Developer-lost	Amit Modi	Thursday 17 March 2016
DFID	Donor	Howard Standen	Friday 13 November 2015
Eco Power (First Interview)	Developer- in GET FiT	Gratian Peiris	Friday 20 November 2015
Eco Power (Second Interview)	Developer- in GET FiT	Gratian Peiris	Monday 28 March 2016
Eleqtra	Developer- lost	Gad Cohen, Alexandra Altfeld	Friday 8 April 2016
ERA	ERA	Dr. Benon M. Mutambi	Tuesday 17 November 2015
ERA	ERA	Ziria Tibalwa	Thursday 19 November 2015
ESNA Power Ltd. and Engineering Consultants Ltd (ENGCL/Akbar Tea)	Developer- lost	Upul Pinto	Thursday 31 March 2016
European Union	Donor	Ludovic Durel	Tuesday 10 November 2015
FMO (Netherlands Development Bank)	Lender- in GET FiT	Bernard von Meeteren	Monday 11 January 2016

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Organization Name	Category	Name	Date Completed
Frontier (first interview)	Developer- in GET FiT	Daniel Schultz	Tuesday 1 December 2015
Frontier (second interview)	Developer- in GET FiT	Daniel Schultz	Monday 28 March 2016
GET FiT Secretariat	GET FiT	René Meyer	Friday 13 November 2015
GIEK (Norwegian Export Credit Agency)	Donor	Åse Pleym Bakken	Monday 21 March 2016
Google	Developer-not applied	Jon Kornik	Monday 4 April 2016
Hydromax (part of Dott Services)	Developer-in GET FiT	Maheswara Reddy, Godrey Senteumbwe	Wednesday 30 March 2016
JELCO (Jacbosen)	Developer-no longer in GET FiT	Terje Gresslien	Friday 11 March 2016
Kakira Sugar (Madhvani Group)	Developer-in GET FiT	Farhan Narkhooda	Monday 16 November 2015
KfW	Donor	Jan Martin Witte	Friday 8 January 2016
KfW Uganda	Donor	Kathrin Kaestle	Tuesday 10 November 2015
KfW Frankfurt (prev. Uganda)	Donor	Stephanie Rieger	Friday 1 April 2016
KfW Uganda (second interview)	Donor	Kathrin Kaestle, Stephanie Rieger	Tuesday 19 April 2016
KMRI	Developer-in GET FiT	Krishnan Raghunathan	Wednesday 6 April 2016
MEMD	GoU	Moses Murengezi	Friday 13 November 2015
Multiconsult	Consultant to GET FiT	Joakim Arntsen	Tuesday 10 November 2015
Multiconsult	Consultant to GET FiT	Svein Erik Harklau	Friday 18 December 2015
Network	Developer- lost	Paul Mwiru	Wednesday 11 November 2015
Norfund (Norwegian Investment Fund for Developing Countries)	Investor-in GET FiT	Mark Davis	Wednesday 20 January 2016
Norway	Donor	Hans Peter Christophersen	Tuesday 10 November 2015

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Organization Name	Category	Name	Date Completed
OPIC (Overseas Private Investment Corporation, USA)	Lender-in GET FiT	Diana Jensen	Tuesday 5 January 2016
PA Technical Services	Developer-in GET FiT	Rune Freyer	Friday 15 April 2016
Proparco	Lender-in GET FiT	Karin Bouwmeester	Tuesday 22 March 2016
PTA Bank (Eastern and Southern Africa Trade Development Bank)	Lender-in GET FiT	Simbarashe Chikarango	Wednesday 16 March 2016
Rural Electrification Agency	GoU	Godfrey R. Turyahikayo, Charles Lutwama	Friday 13 November 2015
SAEMS	Developer-in GET FiT	DJ Zheng, Jody Lehnihan	Wednesday 23, March 2016
SIMBA	Developer-in GET FiT	Sarah Rowell	Tuesday 17 November 2015
Stanbic	Lender-in GET FiT	George Thara, Evelyn Ngatia	Tuesday 5 April 2016
Trinity	Consultant to GET FiT	Paul Biggs	Monday 30 November 2015
UETCL	Uganda power sector	Erasi Kiyemba	Monday 16 November 2015
UETCL	Uganda power sector	Valentine Katabira, George Rwabajungu, Boneventura Buhanga, Martin Erone	Wednesday 18 November 2015
UMEME	Uganda power sector	Isaac Mufumbiro, Simbiso Chimbima, Almero Grey	Friday 13 November 2015
Vidullanka	Developer-in GET FiT	Sandun Thalagala, Riyaz Sangani	Tuesday 12 April 2016
World Bank	Donor	Jean-Pascal Nganou	Wednesday 18 November 2015
World Bank	Donor	Mbuso Gwafila	Wednesday 18 November 2015
World Bank	Donor	Raihan Elahi	Saturday, 17 December 2016
Ziba Limited	Developer-in GET FiT	Sheila Gereko	Thursday 24 March 2016

## **Appendix H: Technical Approach to Attribution**

Attribution involves assessing to what extent GET FiT’s interventions contributed to the outcomes and impacts that occurred. Attribution is the core of this assignment. EQ1, EQ1a, and EQ1b—which address attribution—are thus the most important questions in this evaluation.

We attributed results to GET FiT by examining the effects of GET FiT’s interventions. We did this by tracing processes, starting from GET FiT’s interventions and following the process assumed in the Theory of Change (ToC) to outputs, outcomes, and impacts.

The ToC assumes that GET FiT’s interventions will remove barriers to investment, by changing investor’s perception of risk and reward, and thus leading to private finance being provided where it otherwise would not be. In other words, GET FiT is expected to remove barriers, and this in turn was supposed to increase the flow of private investment. Once the barriers are removed, investors are expected to invest more than they otherwise would have. Tracing this chain starts with examining whether the interventions really did remove the key barriers—which did as follows.

At this point, GET FiT’s expect impacts have largely not been realized (see Appendix E.1). This is to be expected, as only one GET FiT-supported project is producing power, and the impacts result from power being produced. In this First Performance Review and Baseline Report, we are focused on whether the GET FiT removed barriers to investment, and in this way led to RE generation plants being financed. In the latter two evaluation reports, we will check if the outputs, outcomes, and impacts, observed can be attributed to the power plants. Putting these two analyses together will allow us to say whether the output, outcomes and impacts can be attributed to GET FiT.

The way in which we assessed how GET FiT had removed barriers to investments, and how such removal contributed to investment in RE plants. First, an overview of the approach to analyzing attribution is shown. Then, the analysis of attribution of GET FiT’s five interventions is shown in detail:

- Premium Payments
- Standardized PPAs and other legal documents
- Capacity building
- Partial risk guarantees
- Interconnection component.

### **H.1 Concepts and methods used for evaluative questions.**

This section presents an overview of the concepts underlying response to evaluative questions (attribution), and the methods that were used to implement those concepts. This report partially relies on some concepts from contribution analysis and process tracing.

#### **Contribution analysis**

The approach we have taken in assessing whether RE investments can be attributed to GET FiT is known as ‘contribution analysis’ (Mayne 2012). Contribution analysis involves

identifying which of the following describes the relationship between each intervention and thing that the intervention was expected to cause.<sup>88</sup>

- Necessary but not sufficient: GET FiT was necessary for new investment in RE generation to happen, but other interventions were required
- Sufficient but not necessary: GET FiT's interventions were sufficient to bring about new investment, but the investment could potentially have been brought about through other interventions
- Both necessary and sufficient: GET FiT's interventions were necessary to bring about new investments, and no other intervention was required
- Neither necessary nor sufficient: new investment could have happened without GET FiT.

In analyzing contribution, we also identified other interventions that may have produced similar results, drawing on research and findings on similar interventions, in response to PRQ3 (What other programs are being implemented that could have led to the same outputs?).

### **Theory based analysis**

The response to evaluation questions relied theory-based approach to evaluation<sup>89</sup> of GET FiT. That is to say, observed evidence was tested against the theory<sup>90</sup> of how the GET FiT program would be expected to bring about certain results. The Theory of Change (Section 3) shows our program theory, and the causal pathways expected to bring about the results.

### **Process tracing**

The contribution of GET FiT's interventions to observed results was analyzed through process tracing, to test expected causal pathways (following Collier<sup>91</sup>). From the Theory of Change, we wrote down the process by which each intervention was expected to remove a barrier that had hitherto been preventing investment. We noted what we would expect to observe if the process was taking place as planned. For example, in the case of the premium, we would expect to observe that (a) investment is taking place (b) lenders who did not lend before now lend (c) these lenders report that the premium allowed the projects to meet financial covenants such as debt service ratios that lenders require before they will lend. We used this approach for all the hypotheses, and developed interview templates designed to collect all the information required to test each hypothesis, while also following an order of questions that the interviewee would find logical.

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<sup>88</sup> We had, in the Inception Report, intended to use this definition of sufficiency 'Given the conditions prevailing in Uganda at the time of the project, if GET FiT enabled an investment to happen that otherwise would not have happened, without other policy actions by donors or government being necessary, then GET FiT was sufficient'. As we did the analysis for this report, the client asked us to refer to GET FiT as sufficient only if no other conditions at all would have been necessary to make the investment happen. Such other conditions could include the general state of law and policy in Uganda, the financial condition of the power sector, availability of resources, and other factors the absence of which would have meant the project investment would not happen."

<sup>89</sup> <http://www.tbs-sct.gc.ca/hgw-cgf/oversight-surveillance/ae-ve/cee/tbae-acat/tbae-acat02-eng.asp#toc1>,  
[http://betterevaluation.org/resources/guide/theory-based\\_approaches\\_to\\_evaluation](http://betterevaluation.org/resources/guide/theory-based_approaches_to_evaluation)

<sup>90</sup> [http://betterevaluation.org/plan/define/develop\\_logic\\_model](http://betterevaluation.org/plan/define/develop_logic_model)

<sup>91</sup> Collier, D. "Understanding Process Tracing".

## **Evidence**

The types of evidence that were used to inform process tracing are:

- Documented results: for example, were licenses issued; were PPAs signed; has investment needed been committed
- International comparators on key figures: for example, are the post-premium tariffs received by projects in-line with what is typically required to attract private investment in similar projects in other emerging markets
- Interviews with participants, including:
  - Developers, financiers and other stakeholders in all GET FiT supported projects
  - Developers whose projects were not supported by GET FiT
  - Developers and financiers who did not participate in the GET FiT process, even though they might have been expected to.

More detail on how the interviews were used is shown in the detailed analysis of each intervention. An overview to the approach to selecting and contacting interviewees is shown in Appendix G.

We analyzed quality of evidence in through the following means:

- Identifying potential biases for interviewees, and comparing the opinions of interviewees who have different biases—for example, comparing developers’ opinion of the premium statements with DFI lenders’ opinions, because developer have a clear incentive to exaggerate the need for premiums, while DFI lenders do not.
- Discounting evidence that was not reliable for the intended purpose—for example, we chose to not rely heavily on an IRENA study on hydropower pricing, because the study did not adequately explain the sources of its to data such that we could make good comparisons with Uganda.
- Combining different sources of evidence—for example, we concluded that PRGS were not used (documented result) largely because loans to GET FiT projects were not eligible (review of World Bank documents, and interviews with World Bank staff). We also found that one lender who was eligible for a PRG chose not to it because it was perceived as more cumbersome than other options available from an insurer (interview).

## **Judgments on strength of findings**

After analysis of the evidence led us to conclude on certain facts (such as ‘contrary to expectations, PRGs were not useful in removing barriers’ or ‘the GET FiT premium was needed to induce lenders to lend’ we needed to use the facts to make judgements on contribution: for example, was the premium payment necessary to allow the project to be financed. In making such judgements we relied on two criteria.<sup>92</sup>

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<sup>92</sup> This is derived from the discussion of using Bayesian reasoning to combine process tracing with contribution analysis, as found in “Process Tracing and Contribution Analysis: A Combined Approach to Generative Causal Inference for Impact Evaluation” by Befani and Mayne, 2014.

**Uniqueness** tests indicate that a hypothesized causal pathway works, by showing that alternative causal pathways were highly unlikely to have worked.

**Certainty** tests rule out a hypothesized causal pathway, and imply that alternative pathways should be considered. This is also called a “hoop test”, because it entails establishing a necessary criterion for the hypothesized pathway to have worked, and then showing that the criterion was not met (thus failing to “jump through a hoop”).

**Quality of evidence** was weighted through a Bayesian approach. The quality of evidence was judged and weighted qualitatively based on comparison with other evidence, and our knowledge of economics, finance, and the energy sector.

Our process tracing tested the ways that GET FiT is expected help overcome **barriers to investment** in RE in Uganda (see Section 5.2). For example, consider the above discussion of standardized documents. Eight stakeholders said the documents reduced the cost of project preparation, and nine said the documents reduced the time for project preparation. Even two developers with existing PPAs thought the documents save time and reduced costs. This is strong evidence that the PPAs helped facilitate investments by overcoming the barrier of high transaction costs.

### **Realist approach**

We used a realist approach<sup>93</sup> as we examined what actually happened and compared it to the expected process. The key question underlying a realist approach is “What works, for whom, in what respects, to what extent, in what contexts, and how?” That question was asked at each link in the ToC. This entails relying on an assumed model of how certain actors make decisions.<sup>94</sup> These models of decisions help explain how certain interventions would have certain effects—for example, we expected that developers would choose to pursue projects in Uganda because the premium payments made projects profitable. It is assumed that developers are profit-seeking.

Using a realist approach to process tracing enabled us to answer the evaluation questions in realist terms—especially EQ1, on to what extent GET FiT has addressed barriers to private investment in RE. Then, we could show for whom, in what context, how, and why GET FiT has addressed barriers to investment (or not addressed barriers).

An intervention will work (or not work) depending on how actors respond to the program’s interventions. That is to say, the actors’ reasoning that leads them to respond in a certain way to an intervention is a ‘generative mechanism.’ In line with a realist approach, actors’ reasoning can be influenced by contextual factors for different actors. Such context could include resources at the actors’ disposal, or the actors’ grasp of relevant technical knowledge.

A realist approach assumes “that nothing works everywhere or for everyone”.<sup>95</sup> This is critical to ensure that the evaluation identifies why certain results occurred, and to create useful lessons for this program and others. Certain mechanisms may only be beneficial to certain groups of beneficiaries, or only work if applied in certain economic circumstances.

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<sup>93</sup> [http://betterevaluation.org/approach/realist\\_evaluation](http://betterevaluation.org/approach/realist_evaluation)

<sup>94</sup> These models are a key part of the causal mechanism to inform a generative approach to causal inference, as described in Befani and Mayne, 2014.

<sup>95</sup> <http://www.odi.org/sites/odi.org.uk/files/odi-assets/publications-opinion-files/9138.pdf>

Even if GET FiT Uganda turns out to be a resounding success, we do not want to assume that programs with an identical structure are guaranteed to work as well in other places. Our analysis found the circumstances in which certain mechanisms are likely to cause specific results.

We applied the realist approach by ensuring that when gathering evidence—whether through interviews or documented results—we gathered information on the specifics of the actors, the project, and the context. Specificities we explored and documented include:

- Types of renewable energy technology involved
- Quality of the resource
- Certain sizes of projects (MW, or dollars of investment)
- Developers' experience in RE
- Developers' experience in Uganda
- Specific competencies or motivations of the developer
- Ownership and motivation of lenders and equity investors (public or private).

To analyze how specific factors such as these influenced causal pathways, we grouped data by different circumstances to see if patterns emerged. For example, we grouped developers' comments on standardized PPAs by whether they had an existing PPA in Uganda.<sup>96</sup> We found that developers without existing PPAs in Uganda found the standardized documents more important. This helped us to conclude that the standardized documents generally helped overcome the barriers of high transaction costs, especially for developers who did not have existing PPAs, and for lenders, but were less beneficial for developers already operating in Uganda.

### **Selection of interviewees**

We interviewed three groups of developers and investors to facilitate a realist analysis of GET FiT's interventions:

- **Developers and investors with projects that were selected by GET FiT** yielded useful insights in to how GET FiT's interventions had an effect, to what extent, and for whom
- **Developers that submitted projects to GET FiT, but were not selected for support**, yielded insights on what happened to projects which were unsuccessful in GET FiT's tenders
- **Developers and investors that could have been expected to apply for support from GET FiT, but did not**, yielded insights on how GET FiT could appeal to new stakeholders
- **Staff at the Electricity Regulatory Authority** to better understand the results from the capacity building interventions

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<sup>96</sup> We will measure size in terms of the size (in US dollars) of the firm's investments. Firms with investments up to and including USD 100 million will be considered small. Firms with investments exceeding USD 100 million will be large.

- **Staff at other government agencies and power sector entities** to better understand the Ugandan power sector, and collect key foundational data on the sector
- **Staff at international documents** to understand the Ugandan power sector, and other donor activities in the sector.

The approach to selecting interviewees is shown in 0. Questionnaires are presented in Appendix M through Appendix N.<sup>97</sup>

### **Comparison of results between different groups**

We compared comments on specific issues across different stakeholders to see which provided strong evidence and which only weak evidence to confirm or contradict a hypothesis, and what could be concluded when stakeholders' opinions differed from each other. This included taking into account the confirmatory or disconfirmatory power of any given statement from any given stakeholder. For example, we found that developers did not think capacity building for ERA was very important. However, it would be hard for developers to observe the benefits of the capacity building—in fact, few of them were aware of GET FiT's capacity building. Because of this, we did conclude that the developers' statements were not strong evidence to disconfirm the hypothesis that the capacity building was effective in building ERA's capacity.

By contrast, if the ERA's staff, who were the beneficiaries of capacity building, had said that it was not of much value, this would have had strong disconfirmatory power. That is because the ERA staff were both knowledgeable about the situation, and would tend to have an affirmation bias (reporting that the capacity building was useful even if it was not)—so if they actually said it was not useful, it would be strongly disconfirmatory.

In the event, the staff said the capacity building was useful, and were able to give specifics of how it helped. The greater knowledge the staff members had of the situation led us to put more weight on their statements than on the statements of the developers, despite the staff's likely affirmation bias. Nevertheless, given the affirmation bias, we did not see this evidence as sufficiently strong to allow us to draw a clear conclusion that the capacity building was effective, or necessary. We took a similar approach in considering interviewees' statements on all the hypothesis.

### **Interview approach**

The interviews with investors and developers were based on a starting assumption that they are rational financial actors, who try to maximize profits while minimizing risk. Where this assumption appeared invalid (for example with Developer 8) we noted it and took it into account as a 'realist specificity' in our findings.

We followed an interview guide. The interview guide is included in Appendix M. However, we deviated from the guide when responses indicated new areas to explore. We used our judgement in how and when to deviate. This allowed us to explore new avenues of enquiry as they arise, or explore some avenues more deeply when required. For example, we asked Developer 10 a number of questions about its existing IPP. This allowed us to gain valuable background on the Ugandan energy sector from an existing participant.

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<sup>97</sup> Formal questionnaires were used for developers, lenders, investors, and ERA staff. This was important to make use of their opinions in analyzing contribution. For other stakeholders, interviews were deliberately less structured, to allow more flexibility in exploring different issues.

The questions in the guide aimed to draw out the following:

- Actors' motivations and reasoning
- How motivations and reasoning differ across groups and contexts.

Within the interviews, we asked questions on each barrier to investment, and each of GET FiT's interventions, in a non-biasing manner. First, we asked open-ended questions about the interventions. All else being equal, open-ended questions should bring out the points most salient in respondents' mind, and be relatively free of bias. However, if an open-ended question did not yield a response, or if we wanted to explore other issues in addition to the given response, we would ask more focused prompts.

For example, we did not start discussing the standardized documents by asking if they reduced legal fees, although we expected that to be true. Instead, we first asked "What do you think of the standardized PPA and other legal documents offered under GET FiT?" We then recorded responses. If the response did not mention investment decisions, we then we asked "Did the standardized documents impact your investment decision in any way?" We then noted their responses, and asked probing questions if needed to better understand how the documents impacted decisions. If they did not mention cost reduction, we asked "Did the standardized documents have any impact on costs associated with your project? In what way?" We asked about cost when it was not volunteered by the interviews because we expected lowering costs to be the channel through which the standardized documents would help.

The interviews with developers and investors tested expected causal pathways for all of GET FiT's five interventions.

At the end of the interviews, we asked "do you have any other comments?" We know from experience that we would most likely not be able to ask all questions in all interviews, as time will be limited. In some interviews we may want to explore certain issues in more depth, while de-emphasizing others. Our interviews also tested if the barriers that GET FiT aimed to address actually existed in Uganda.

Our approach yielded findings across different groups. For example, we found the following on PRGs:

- Most projects did not use PRGs because they had loans from DFIs, and were thus ineligible for PRGs
- Two projects with commercial lending were eligible for PRGs, but did not use them (these projects had the same developer and lender). The lender instead opted for political risk insurance from Africa Trade Insurance (a donor-backed insurer), because applying for a PRG would be too cumbersome.

Similar types of differences were noted for various stakeholder groups, with respects to each of the interventions.

### **Limitations of approach to interviews**

Limitations resulting from our approach to research interviews are shown below:

- We may have faced **biased responses** from self-interested stakeholders. This was addressed by weighting quality of evidence from various, following the approach in Appendix H.2. For example, we think developers have a vested interest in saying the premium payments were necessary (see Section 5.2). Developers would be glad

to increase profits beyond what is required through subsidies. They may then exaggerate the importance of the premium payment, in the hope that GET FiT programs in other countries will also subsidize large profits. As discussed in 0, we aimed to minimize the effect of that bias on our analysis by developers' opinions of premiums against the opinions of lenders, and comparing revenue to GET FiT projects against known tariffs in other countries.

- Only one of three **commercial lenders** to GET FiT projects was interviewed. Then, understanding of the commercial lenders' views was somewhat limited. Also, the two lenders providing corporate financing loans (rather than project financing) were not interviewed.
- We may face **non-response bias** in qualitative interviews. That is to say, those stakeholders that are willing to participate may share certain motives, or opinions of GET FiT. This may particularly true with interviewees who are not participating in GET FiT (developers that applied to GET FiT but were not selected, and RE stakeholders that did not apply to GET FiT). The most disgruntled of the rejected applicants may not be keen to talk. We managed to interview 58 percent of unsuccessful bidders. Similarly, stakeholders who never applied to GET FiT may not want to be interviewed, as they have no direct connection to the program. We interviewed 44 percent of the target sample size for those stakeholders. This may then overweight that sample towards stakeholders who were more aware of, or interested in, GET FiT.

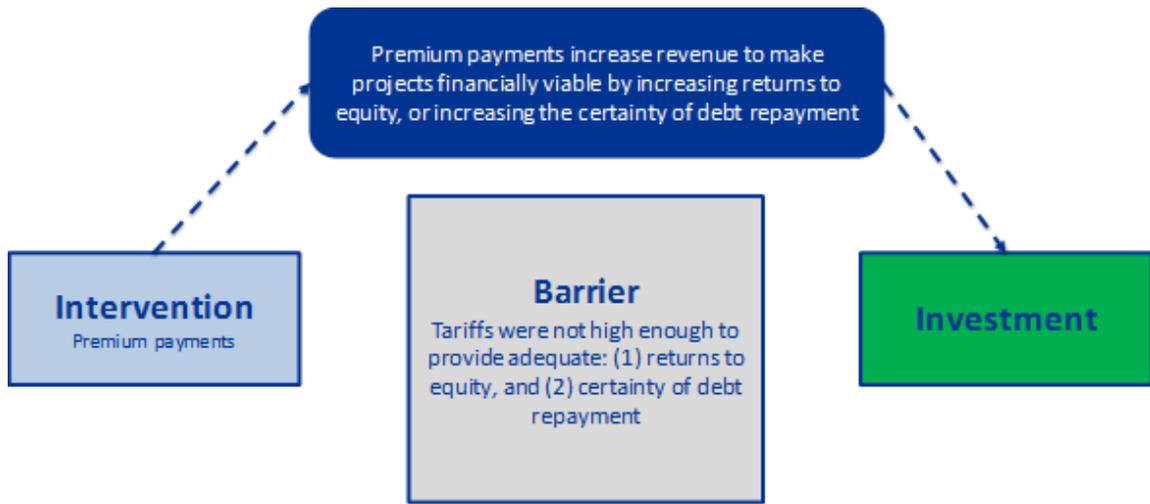
A presentation of the analysis of attribution for each instrument in GET FiT follows:

- Premium payments
- Standardized PPAs and other legal documents
- Capacity building for ERA
- Partial risk guarantees
- Interconnection component.

## **H.2 Premium payments**

The analysis of the premium payment aimed to understand if and how the premium payments overcame the barrier of REFiT tariffs being too low to provide adequate returns on equity (for investors), or adequate certainty of debt repayment (for lenders). This barrier is shown below

Figure H.1: Causal Pathway for Premium Payment



The premium payment would be expected to overcome the barrier of tariffs being too low by providing additional revenue, such that total revenue (REFiT plus the premium payment) would be adequate for equity investors and lenders.

The hypotheses that were tested through interviews with developers are shown in Table H.1. This table shows hypotheses used to guide work from the start, and alternative hypotheses that were developed in the course of ongoing work.

Table H.2 explains how the hypotheses were tested.

**Table H.1: Hypothesized Causal Pathways**

Name of hypothesis	Context	Mechanism	Result
<b>Starting hypotheses</b>			
Premiums enable profits for developers and equity investors	Developers and equity investors	Additional revenue from the premium payment makes projects financially viable by providing adequate returns on equity	Investments are made in projects that become viable because they generate sufficient revenue
Premiums enable financial ratio requirements to be met for lenders	Lenders	Additional revenue from the premium payment makes projects financially viable by providing adequate certainty of repayment to lenders. The test is whether the additional revenue leads lenders to expect that key financial ratios, such as the Debt Service Coverage Ratio, will be satisfied when the project is operating.	Loans are made to projects that become viable because they generate sufficient revenue to meet lenders' financial requirements
Premium payments provide low-risk payments	Developers, equity investors, or lenders	Premium payments reduce risk because they are provided by a reliable source (KfW)	Investments are made in projects because payment risk is reduced

Table H.2: Analysis of Hypotheses

Name of hypothesis	Data used	Approach used	Tests	Comments
<b>Starting hypotheses</b>				
<p>Premiums enable profits for developers and equity investors</p>	<ul style="list-style-type: none"> <li>▪ Interviews with stakeholders</li> </ul>	<ul style="list-style-type: none"> <li>▪ Used interviews to find out whether developers and equity investors required the premium payments</li> <li>▪ Compared effective tariff levels with and without the premium to our experience of what similar privately financed projects require in other emerging markets.</li> <li>▪ Checked the extent to which RE projects are going ahead without GET FiT (interviews)</li> </ul>	<ul style="list-style-type: none"> <li>▪ A hoop test conducted on interview results. In particular, developers and equity investors were asked what would have happened to their projects without support from GET FiT, and why. If those stakeholders indicate that their projects would not proceed, then stakeholders would be identified as claiming the premium was necessary.</li> <li>▪ Effective tariff levels in GET FiT were compared with Castalia’s knowledge of RE tariffs, and with international benchmarks from a report on emerging market RE from IRENA. However, these benchmarks were not the most reliable as it was unclear what countries they came from.</li> </ul>	<p>-</p>

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Name of hypothesis	Data used	Approach used	Tests	Comments
<p>Premiums enable financial ratio requirements to be met for lenders</p>	<ul style="list-style-type: none"> <li>▪ Interviews with stakeholders</li> </ul>	<ul style="list-style-type: none"> <li>▪ Used interviews to find out whether lenders required the premium payments, and why</li> </ul>	<p>Hoop tests were conducted on interview results. In particular, lenders were asked what would have happened to their projects without support from GET FiT, and why. If lenders indicate that they would not have made loans, then lenders would be identified as claiming the premium was necessary.</p>	<p>-</p>
<b>Alternative hypotheses</b>				
<p>Premium payments provide low-risk payments</p>	<ul style="list-style-type: none"> <li>▪ Data on REFiT and premium payment offerings in GET FiT bidding documents</li> <li>▪ Interviews with stakeholders</li> </ul>	<ul style="list-style-type: none"> <li>▪ Calculated premium payments as a percentage of total revenue, and checked if the percentages are high enough to cover a large portion of revenue</li> <li>▪ Used interviews to find out how developers, equity investors, or lenders were impacted by the certainty of premium payments</li> </ul>	<ul style="list-style-type: none"> <li>▪ This hypothesis was only explored in one interview. This interview led to the development of this hypothesis, as the interviewee mentioned (unexpectedly) that premium payments provided a reliable revenue stream. However, the interviewee did not indicate this was an important part of his lending decision</li> <li>▪ Our analysis showed that premium payments provided at most 33 percent of total revenue. Logically, to materially reduce risk, the payment would have to be a material part of revenue.</li> </ul>	<ul style="list-style-type: none"> <li>▪ The percentage of revenue offered, the fact that developer did not place a strong weight on this, and the fact that no other interviewees mentioned it, led us to conclude that the effect of the premium payments on risk (as opposed to on returns) was unlikely to have been a significant factor in attracting investment</li> </ul>

Name of hypothesis	Data used	Approach used	Tests	Comments
REFiT provides adequate revenue	Interviews with stakeholders	<ul style="list-style-type: none"> <li>▪ Used interviews to find out whether developers and equity investors required the premium payments, and why</li> <li>▪ Used interviews to see if projects that were unsuccessful in GET FiT tenders were going ahead, and why</li> <li>▪ Compared REFiT to our knowledge of tariffs in emerging markets</li> </ul>	<ul style="list-style-type: none"> <li>▪ Hoop tests were conducted on interview results. In particular, developers, equity investors, and lenders were asked what would have happened to their projects without support from GET FiT, and why. If those stakeholders indicate that their projects would proceed, then stakeholders would be identified as claiming the premium was unnecessary, which is logically equivalent to REFiT tariffs providing adequate revenue.</li> </ul>	-

Using the tests mentioned, stakeholder's opinions on the necessity of premium payments were collected as shown in Table H.3.

The letters in the columns labeled "opinion" should be interpreted as follows:

- "✓" = necessary
- "U" = unnecessary
- "ND" = not discussed.

The categories of stakeholders are:

- Developers: institutions that are responsible for the work of taking a project from concept to financial close, and often own a portion of the project
- Equity investors: institutions that make equity investments in power projects, and thus own a portion of projects
- Lenders: institutions that make loans to power plant projects.

All developers for the 17 projects were interviewed. One equity investor was interviewed, who had two projects. Lenders for 13 projects were interviewed. One project did not have a lender (all equity financing). The sample of interviewees is described in more detail in 0.

Table H.3: Stakeholders' Opinions on Premium Payments

Project	Developer		Equity Investor		Lender	
	Name	Opinion	Name	Opinion	Name	Opinion
Project 1	Developer 6	✓			<i>Lender not interviewed</i>	
Project 2	Developer 2	✓	Equity Investor 1	✓		
Project 3	Developer 12	✓			<i>Lender not interviewed</i>	
Project 4	Developer 4	✓			Lender 2	✓
Project 5	Developer 11	U			<i>Lender not interviewed</i>	
Project 6	Developer 7	✓	<i>Not interviewed</i>		Lender 3	✓
Project 7	Developer 8	U			Lender 4	✓
Project 8	Developer 4	✓			Lender 5	ND*
Project 9	Developer 4	✓			Lender 5	ND*
Project 10	Developer 9	✓			Lender 2	✓
Project 11	Developer 3	✓	Equity Investor 1	✓	Lender 1	✓
Project 12	Developer 7	✓	<i>Not interviewed</i>		Lender 3	✓
Project 13	Developer 4	✓			Lender 2	✓
Project 14	Developer 4	✓			Lender 2	✓
Project 15	Developer 1	✓			Lender 2	✓
Project 16	Developer 10	✓			Lender 2	✓
Project 17	Developer 5	✓			Lender 4	✓

Source: Interviews by Castalia.

Notes: \* The interviewee at Lender 5 said he had not yet done the financial analysis which would allow him to answer this question. He only modelled the project with the GET FiT premium in place.

If a cell in a "Name" column is blank, then there was no such stakeholder for a given project (for example, Project 2 did not have a lender).

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The findings for individual stakeholders were then synthesized to make findings for individual projects, and to try to identify certain contexts in which certain results may be observed. This include comparing responses of developers and lenders against each other, and weighing of evidence based on stakeholders' expected biases and motivations. This is shown in Table H.4.

Table H.4: Aggregated Results, Stakeholders' Opinions on Premium Payments

Count of Projects	Project Names	Opinion			Conclusion for projects	Analysis
		Developer	Equity	Lender		
<b>Lender and developer in agreement that premium was necessary</b>						
7	4,10,13,14,15, 16, 17	Necessary		Necessary	Necessary	The developers and lenders agree that the premium payment was necessary. Developers said the project would not have been viable without the premium payment, and lenders said they would not have made loans without the premium payment.
2	6, 12	Necessary	Not interviewed	Necessary	Necessary	Both projects have the same lender developer, lender, and equity investor. The developer and lender agree that the premium payment was necessary. The equity investors were not interviewed, but should have the same requirements as the developer, since developers also provide equity financing.
1	11	Necessary	Necessary	Necessary	Necessary	The developer, lender, and equity investor are in agreement. The developer and lender said the project would not have been viable without the premium payment. The lender said it would not have made a loan without the premium payment.
<b>Lender and developer not in agreement that premium was necessary</b>						
1	7	Unnecessary		Necessary	Necessary	This developer was focused on doing good for the world by supporting clean energy, and less concerned about profits. Thus this developer may have been willing to accept a lower return than most. However, the lender required the premium payment, so the premium was necessary for the project to go ahead.

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Count of Projects	Project Names	Opinion			Conclusion for projects	Analysis
		Developer	Equity	Lender		
<b>Project did not have a lender</b>						
1	2	Necessary	Necessary		Necessary	The developer and equity investor are in agreement that the project would not have been viable without the premium. The project did not have a lender.
<b>Lenders' opinion not known</b>						
2	1,3	Necessary		Not interviewed	Necessary	The developers indicated their projects would not have been financially viable without premium payments. Projects 1 had corporate financing, rather than project financing (that is to say, the developer borrowed based on the strength of the wider company rather than one power plant). Project 3 had project financing.
2	8,9	Necessary		Not discussed	Necessary	Both projects have the same developer and the same lender. The developer indicated the projects would not have been viable without the premium payment. The interviewee at the lender said the loans had only been analyzed with the assumption the premium is paid, so he did not have an opinion on the viability of the project without the premium. In our professional opinion, lenders are likely to have similar financial requirements, and this lender likely would also require the premium payment. If anything, this lender would be more demanding than the DFIs, as it is a private lender, and likely to have more demanding profit targets.

Count of Projects	Project Names	Opinion			Conclusion for projects	Analysis
		Developer	Equity	Lender		
1	5	Unnecessary		Not interviewed	Necessary	The developer claims to have lower than normal costs, by relying heavily on equipment from China instead of Europe; using some equipment designed by the developer; and doing all EPC work in house. The lender was not interviewed. However, given lenders' general conservatism, and the fact the lender to the project was private, it is likely that the premium still would have been required for lending. This claim will be checked in the next report in this engagement.
17 (total)	-	-	-	-		

Source: Interviews by Castalia

Stakeholders were generally not focused on the relative certainty of premium payments from GET FiT. Equity Investor 1, an equity investor with two projects in the program, said one of the benefits of the premium was providing a “triple A revenue stream” for a portion of payments to a project. Other stakeholders did not mention certainty as a benefit of the GET FiT premium payment (though they were never directly asked about it). This may be because the premium represented a relatively small portion of the total project revenue, as shown in Table H.5.

**Table H.5: GET FiT Premium Payments as Percentage of Total Revenue**

Technology	Premium Payment as Percent of Total Revenue			
	RfP 1	RfP	RfP	Solar RfP-
Hydro (1MW to 8.9MW) bottom of linear scale)	16% to 22%	11% to 14%	11% to 14%	-
Hydro (From 9MW to 20MW, inclusive)	22%	14%	14%	-
Bagasse (From 1MW to 20MW, inclusive)	11%	11%	5%	-
Biomass (From 1MW to 20MW, inclusive)	9%	9%	9%	-
Solar (From 1MW to 20MW, inclusive)	-	-	-	33%

Source: Tender documents, interviews with developers

Note: This is the sum of REFiT and the premium payment in per-KWh terms. These were calculated based on the data in Table H.6

Castalia’s analysis shows that premium payments provide at most 33 percent of revenue. In a project-finance context for small projects, this is not enough to provide a meaningful “certainty effect”.

The total revenue offered to GET FiT projects (REFiT plus GET FiT) is shown in Table H.6.

**Table H.6: Total Revenue to GET FiT Projects**

Technology	Capacity	Payment Type	Revenue (US\$ per KWh)		
			RfP 1	RfP 2	RfP 3
<b>Hydropower</b>	Greater than or equal to 1MW, less than 9MW	Total effective tariff	\$0.093 to \$0.129	\$0.093 to \$0.129	\$0.099 to \$0.129
		REFiT	\$0.073 to \$0.109	\$0.079 to \$0.115	\$0.085 to \$0.115
		Premium	\$0.020	\$0.014	\$0.014
	Greater than or equal to 9MW, less than or equal to 20MW	Total effective tariff	\$0.093	\$0.099	\$0.099
		REFiT	\$0.073	\$0.085	\$0.085
		Premium	\$0.020	\$0.014	\$0.014
<b>Bagasse</b>	1MW to 20MW, inclusive	Total effective tariff	\$0.091	\$0.091	\$0.100
		REFiT	\$0.081	\$0.081	\$0.095
		Premium	\$0.010	\$0.010	\$0.05

Source: Financial models from bidding documents

Note: Solar tariffs are not shown here, as solar tariffs were determined through competitive bidding, rather than through fixed schedules as for the above projects. Biomass is not shown because no biomass projects are supported by GET FiT.

These benchmarks were found from previous Castalia studies:

- A 60MW bagasse power plant in Jamaica requires a tariff of US\$0.12 per kWh to be profitable (long-run marginal cost).<sup>98</sup> This is above the total revenue of US\$0.91 to US\$0.10 offered by GET FiT, which is consistent with the GET FiT premium payments not being excessive.
- A 19MW hydropower power plant in Belize requires a tariff of us\$0.11 per KWh to be profitable.<sup>99</sup> This is above the total revenue of US\$0.093 to US\$0.099 offered by GET FiT, offered by GET FiT, which is consistent with the GET FiT premium payments not being excessive.

### H.3 Standardized PPAs and other legal documents

The analysis of the standardized PPAs and other legal documents aimed to understand if and how the documents overcame the barrier of transaction costs being too high. This barrier is shown in.

**Figure H.2: Causal Pathway for Standardized PPAs and Other Legal Documents**



The standardized PPA and other legal documents would be expected to overcome the barrier of transaction costs being too high by reducing costs related to drafting or negotiation of contracts, or due diligence on contracts.

The hypotheses that were tested through interviews with developers and lenders are shown in Table H.7. Table H.7 shows hypotheses used to guide work from the start, and alternative hypotheses that were developed in the course of ongoing work. Table H.8 explains how the hypotheses were tested.

<sup>98</sup> Castalia study “Options to Bring Down Electricity Costs in Jamaica.” The data in that report was given by the Sugar Industry Authority on the basis of recent feasibility studies for bagasse cogeneration projects. This estimate is consistent with prices of electricity purchased by the utility in Mauritius from independent power producers operating bagasse cogeneration plants

<sup>99</sup> Castalia study “Belize Sustainable Energy Strategy.” Castalia used financial modelling to estimate required tariffs.

**Table H.7: Hypothesized Causal Pathways**

Name of hypothesis	Context	Mechanism	Result
<b>Starting hypotheses</b>			
Standardization reduces risk for developers and equity	Developers and equity investors without PPAs in Uganda	Standard PPAs and other documents reduce legal risk for developers and equity.	Investments are made in projects that become viable because legal risk is reduced
Standardization reduces cost for lenders	International lenders	Standard PPAs and other documents meet international standards , and thus reduce costs for lenders by saving money on legal and other expenses.	Investments are made in projects that become viable because legal risk is reduced
<b>Alternative hypotheses</b>			
Standardization reduces transaction costs for developers and equity	Developers and equity investors without PPAs in Uganda	Standard PPAs and other documents reduce legal risk, and thus reduce costs for developers and equity, by saving money on legal and other expenses.	Investments are made because transaction costs related to negotiating contracts are reduced

**Table H.8: Analysis of Hypotheses**

Name of hypothesis	Data used	Approach used	Tests	Comments
<b>Starting hypotheses</b>				
Standardization reduces risk for developers and equity	<ul style="list-style-type: none"> <li>▪ Interviews with stakeholders</li> </ul>	<ul style="list-style-type: none"> <li>▪ Used interviews to find out how developers, and equity investors were affected by the standardized documents</li> </ul>	<ul style="list-style-type: none"> <li>▪ Developers and equity investors were asked if the standardized documents had any impact on risks, and how. They were also asked if they viewed legal risk as significant.</li> </ul>	<p>We decided to reformulate this hypothesis when we realized that what mattered for reducing was having good quality documents, rather than documents that were the same for everybody (standard). The hypothesis as originally formulated was not one respondents could respond to unambiguously. For example, the documents might not have reduced risk, if the counterfactual was that the lender would not lend unless quality documents that reduce risk had been prepared by the developer. In this case, in any scenario, risk levels would have been the same, or the project would not proceed. However, the cost of producing such documents might have been too high, and so the documents might have been necessary, even if they did not reduce risk.</p> <p>We reformulated the hypothesis to focus on whether the standardization reduced costs, since this could give unambiguous responses</p>

Name of hypothesis	Data used	Approach used	Tests	Comments
Standardization reduces cost for lenders	<ul style="list-style-type: none"> <li>▪ Interviews with stakeholders</li> </ul>	<ul style="list-style-type: none"> <li>▪ Used interviews to find out how lenders were affected by the standardized documents</li> </ul>	<ul style="list-style-type: none"> <li>▪ Lenders and equity investors were asked if the standardized documents had any impact on costs, and how.</li> </ul>	-
<b>Alternative hypotheses</b>				
Standardization reduces transaction costs for developers and equity	<ul style="list-style-type: none"> <li>▪ Interviews with stakeholders</li> </ul>	<ul style="list-style-type: none"> <li>▪ Used interviews to find out how developers, and equity investors were impacted by the standardized documents</li> </ul>	<ul style="list-style-type: none"> <li>▪ Hoop tests were conducted on interview results. In particular, developers and equity investors were asked how their projects would have been impacted if standardized documents were not offered. If those stakeholders indicated that their projects would not proceed, then they were identified as claiming the standardized documents were necessary.</li> <li>▪ Developers and equity investors were asked if the standardized documents had any impact on costs, and how.</li> </ul>	-

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Name of hypothesis	Data used	Approach used	Tests	Comments
Standardization reduces transaction costs for lenders	<ul style="list-style-type: none"><li>Interviews with stakeholders</li></ul>	<ul style="list-style-type: none"><li>Used interviews to find out how lenders were impacted by the standardized documents</li></ul>	<ul style="list-style-type: none"><li>Hoop tests were conducted on interview results. Lenders were asked how their projects would have been impacted if standardized. If those stakeholders indicated that their projects would not proceed, then they were identified as claiming the standardized documents were necessary. documents were not offered</li><li>Lenders were asked if the standardized documents had any impact on costs, and how.</li></ul>	-

The importance of standardized documents to project stakeholders is shown in Table H.9. The letters in the columns labeled “opinion” should be interpreted as follows:

- “✓” = necessary
- “U” = unnecessary
- “ND” =not discussed

As shown in Table H.9, the standardized PPAs and other legal documents were necessary for 13 projects. The benefits provided by the standard PPAs and other legal documents are shown in Table H.10.

**Table H.9: stakeholders’ Opinions on Standardized PPAs and Other Legal Documents**

Project	Importance	Developer		Equity Investor		Lender	
		Name	Opinion	Name	Opinion	Name	Opinion
Project 1	U	Developer 6	U			Not interviewed	
Project 2	U	Developer 2	U	Equity Investor 1	ND		
Project 3	U	Developer 12	U			Not interviewed	
Project 4	✓	Developer 4	✓			Lender 2	✓
Project 5	✓	Developer 11	✓			Not interviewed	
Project 6	✓	Developer 7	✓			Lender 3	✓
Project 7	✓	Developer 8	✓			Lender 4	✓
Project 8	✓	Developer 4	✓			Lender 5	✓
Project 9	✓	Developer 4	✓			Lender 5	✓
Project 10	✓	Developer 9	U			Lender 2	✓
Project 11	U	Developer 3	U	Equity Investor 1	ND	Lender 1	U
Project 12	✓	Developer 7	✓			Lender 3	✓
Project 13	✓	Developer 4	✓			Lender 2	✓
Project 14	✓	Developer 4	✓			Lender 2	✓
Project 15	✓	Developer 1	✓			Lender 2	✓
Project 16	✓	Developer 10	U			Lender 2	✓
Project 17	✓	Developer 5	U			Lender 4	✓

Source: Interviews by Castalia

Table H.10: Benefits of Standardized PPA and Other Legal Documents

Stakeholder	Existing PPA in Uganda	Stakeholder's Comments on Documents		
		Necessary	Reduces cost of Preparation	Reduces Time for Preparation
Developer 1		✓	-	-
Developer 2		U	✓	✓
Developer 3	✓	U	-	-
Developer 4		✓	✓	✓
Developer 5	✓	U	-	-
Developer 6	✓	U	-	-
Developer 7		✓	-	-
Developer 8		✓		
Developer 9	✓	U	✓	✓
Developer 10	✓	U	-	-
Developer 11		✓		✓
Developer 12		U		
Equity Investor 1		U	-	-
Lender 1		U	✓	✓
Lender 2		✓	✓	✓
Lender 3		✓	✓	✓
Lender 4		✓	✓	✓
Lender 5		✓	✓	✓

Source: Interviews by Castalia

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The findings for individual stakeholders were then synthesized to make findings for individual projects, and to try to identify certain contexts in which certain results may be observed. This include comparing responses of developers and lenders against each other. Incentives for biased responses were not a significant concern for our analysis of standardized documents. Based on Castalia's knowledge of RE investment, there is not a strong incentive for bias (as opposed to the desire to exaggerate the need for subsidies to collect more profits). This synthesis is shown in Table H.11.

**Table H.11: Aggregated Results, Stakeholders' Opinions on PPAs**

Count of Projects	Project Names	Opinion		Conclusion for projects	Notes
		Developer	Lender		
9	4, 6, 7, 8, 9, 12, 13, 14, 15	Necessary	Necessary	Necessary	The developers and lenders agree that the standardized documents were necessary for the project to go forward. All these developers are new to the Ugandan power market; in that they did not have an active PPA before submitting a bid to GET FIT. This is consistent with Castalia's knowledge of RE investment.
3	10, 16, 17	Unnecessary	Necessary	Necessary	These three projects' developers already have active PPAs in Uganda, and that they think they could have developer their projects without standardized documents. However, their lenders said they would not have made loans without the standardized documents. Then, the standardized documents were necessary for these projects, as they were necessary for loans to be made, and the projects need financing. This is consistent with Castalia's knowledge of RE investment.
1	11	Unnecessary	Unnecessary	Unnecessary	This developer already has an active PPA in Uganda, and thus did not require the standardized documents. The lender also thought it could have made a loan without the standardized documents, and expressed slight uncertainty (this is, in Castalia's opinion, possible but very atypical for a lender to RE projects in Africa). The evaluators surprised by the lender's response, but will accept it as stated, since the lender seemed fairly confident in this, and the lender would not benefit from saying this. The standardized documents were then likely unnecessary, since neither the developer nor the lender required them.

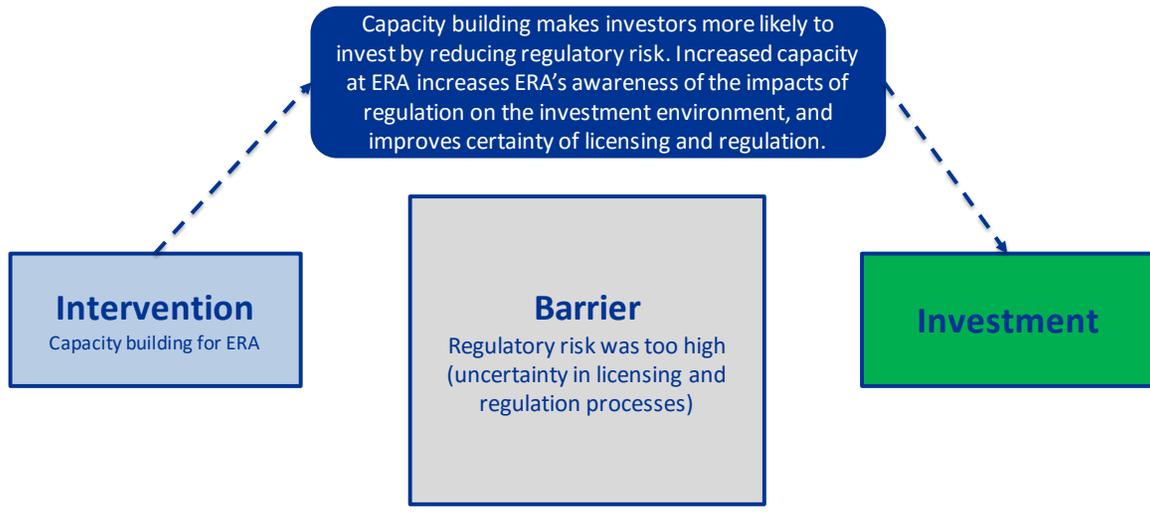
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Count of Projects	Project Names	Opinion		Conclusion for projects	Notes
		Developer	Lender		
1	5	Necessary	Not interviewed	Necessary	The developer said the standardized documents were required to pursue the project. In Castalia's experience, the vast majority of lenders tend to have similar concerns about legal documents. Then, this lender is likely to have also required the documents.
1	2	Unnecessary	No lender	Unnecessary	The standardized PPAs were unnecessary for this project, as its developer said it could have developed the project without them, and there is no lender. This developer has a large team of experienced project development professionals.
2	1, 3	Unnecessary	Not interviewed	Unnecessary	These projects' developers said they could have developed the projects without the standardized documents (one already has an active PPA in Uganda, and the other has an in-house legal team). As all lenders tend to have similar concerns about legal documents, the lenders are likely to have also required the documents. However, since only the developer's opinion was given, the developer's opinion is accepted without hard evidence to the contrary.

## H.4 Capacity building

The analysis of capacity building aimed to understand if and how the documents overcame the barrier of regulatory risk being too high. This barrier is shown in Figure H.3.

**Figure H.3: Causal Pathway for Capacity Building**



The focus areas for GET FiT's capacity building are:

- Project due diligence
- Tariff modelling
- Interconnection (oversight of interconnection and wheeling and compliance monitoring of distribution).

Only the capacity building on due diligence was studied in this report. The other capacity building engagements will be explored in the next two reports in this engagement, as it is too early to study results now (Second Performance Review and Midterm Evaluation, and Final Performance Review and End-Term Evaluation). The engagement on tariffs only recently ended, and the engagement on interconnection has not yet started.

As proposed in the Inception Report, Castalia interviewed developers, equity investors, and lenders about their opinions on the capacity building for ERA, to see which projects required capacity building. However, it became apparent that those interviewees were highly unlikely to be able to understand how capacity building worked for ERA. Those interviewees cannot see inside ERA.

The analysis instead focused on assessing how the capacity building affected ERA, and how that might have affected ERA's general activities. Three senior staff at ERA were asked their general opinion of the capacity building, and how it affected ERA. Those staff are CEO Benon Mutambi, Director of Technical Regulation Ziria Tibalwa, and Director of Economic Regulation Geoffrey Okoboi. The two directors of regulation are arguably the best qualified staff to opine on the effects of the capacity building, as it focused on the work areas they directly manage. The CEO's opinion was not heavily factored into this analysis, as he only spoke briefly on regulation.

The three interviewees at ERA all agreed that the capacity building was very helpful. The key points from their responses are:

- Benon Mutambi:
  - The capacity building for due diligence of hydropower projects was particularly beneficial, and helped increase transparency.
- Ziria Tibalwa:
  - The capacity building has not only enhanced ERA’s internal capacity to review permits and license application but has increased ERA’s visibility nationally, regionally and internationally
  - The capacity building helped us to review and amend the permit and license application forms and instruments, helped ERA to develop and operationalize the license monitoring framework for projects at permit, license, construction and operational stage for the GET FiT technologies (including hydro, solar, biomass and bagasse and helped to review the permit and license terms and conditions to make them relevant and adequate)
  - Without the capacity building, it would have been challenging to bring ERA to its current capacity. It probably would have taken “some years to be where we are now”. She also said that the capacity building has made the licensing system “more effective, proactive, and faster”. It has also greatly improved communications with developers through the Renewable Energy Development Guide that was prepared under the capacity building.
- Geoffrey Okoboi:
  - Learning and templates from the capacity building on tariff modelling has already been applied in financial analysis for licensing. This has made licensing reviews faster than in the past
  - He also said that the tariff benchmark database providing in the capacity building could be improved. It should have more data on other countries in Africa and elsewhere, to allow for regional and international comparisons.

Those positive opinions from ERA staff were compared with developers’ and lenders’ outlook on ERA’s capacity, as found in interviews. Those interviewees were asked their opinion of ERA’s current capacity, and if and how they have observed it changing over time. These interviewees’ responses were consistent with the capacity building being helpful.

Table H.12 shows developers’ opinions of ERA’s capacity, which are generally positive. Of the six developers who had an opinion on how ERA’s capacity has changed over time, five said it has improved. One said capacity has remained the same. No developer said capacity has declined. All nine developers who had an opinion ERA’s current capacity had a positive outlook, although some areas for improvement were pointed out.

Table H.12: Developers' Opinions of ERA's Capacity

Developer	Change in capacity	Quality of capacity now
2	-	"Very happy" with how ERA has performed.
3	Improved since 2008, when relations with ERA began.	ERA is more professional. ERA's communication is generally good and well organized. ERA focuses on pertinent issues.
4	No substantial changes since late 2011 or early 2012, when relations with ERA began. Dialogue was good with ERA even before GET FiT.	ERA is probably the best regulator in East Africa. ERA is not very political, and has good leadership.
5	There has been a lot of positive change since before GET FiT. ERA is faster, and more diligent with site visits. Much improvement is due to having clearer policies and standardization.	ERA has improved a lot, but still lacking in terms of follow through with developers (for example, offers to help deal with other Government agencies).
Developer whose project is no longer supported by GET FiT	Interactions with GET FiT have brought improvements. Capacity has improved.	ERA is still extremely slow to respond.
7	-	GET FiT is well managed by regional standards, and far more transparent than would be expected.
9	ERA has learned "quite a bit" since before GET FiT started.	ERA has become stricter, is asking more than before, and is more in control.
11	-	Some offices give "very superb service." Other offers do not. ERA is generally accessible, and one can easily schedule meetings with ERA.
12	Since 2013 (when GET FiT launched) ERA has been more supportive of, and helpful to, developers.	The technical and economic teams are very resourceful.

Source: Interviews by Castalia. The relevant interview questions are:

What experience do you have working with the Electricity Regulatory Authority (ERA)?

What is your view of ERA's capacity? Have you seen any changes in its capacity? What changes have you seen?

Trends in issuance of licenses were also analyzed, for comparison against ERA's claims that the capacity building has made licensing move faster. Available data imply that ERA likely has issued licenses much quicker after the capacity building than it had previously. Given that the

interviewees from ERA think the capacity building greatly improved the efficiency of licensing, it is unlikely ERA that could have accelerated issuance of licenses so quickly without the capacity building. From 2013 until now, ERA has issued 19 licenses, of which 10 were for GET FiT projects. This includes 13 licenses in 2015 alone. In 2012, ERA only issued two licenses, and none in 2013. This was described in Section 5.2.3.

The available data on trends in licensing only go back to 2012. An ideal analysis would rely data going back earlier, to be sure there was a long-running trend of relative few licenses being issued per year. However, given general trends in installation of generation capacity in Uganda, it is likely that issuance of licenses has accelerated. In 2017 alone, ERA issued 13 licenses for power plants. There are presently 14 power plants operating in the whole country, according to data from the public generation company (UEGCL). In other words, enough licenses were issued in 2015 alone to nearly double the number of power plants in the country.

Another nine licenses have yet to be issued for GET FiT-supported projects. If only GET FiT-supported projects were commissioned through 2020, the total number of operating power plants in Uganda would increase to 30 by 2020, from 14 at present.

However, it is not possible to say that individual projects required the capacity building or not. This would require developing a counterfactual scenario without capacity building, and figuring out how licensing would have proceeded in that scenario.

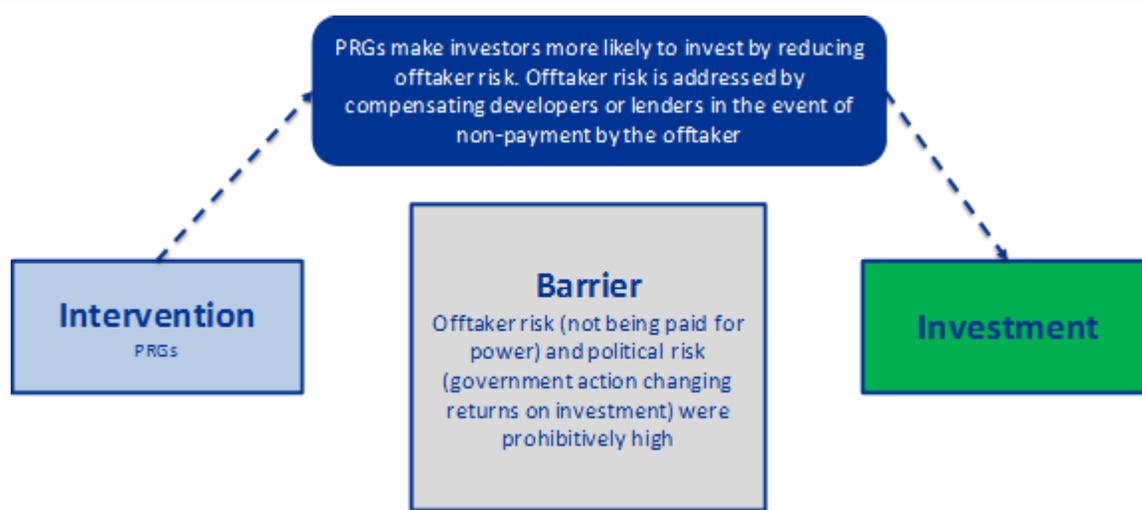
Based on the opinions of ERA staff and developers, and data on licensing and commissioning of power plants, it is highly likely that GET FiT's capacity building on due diligence was necessary for license to be issued quickly in 2015 and later. It is reasonable to conclude that the capacity building was necessary for GET FiT's portfolio to be at its current size of 17 power plants. Without the capacity building, it is likely the portfolio would be much smaller, but the amount cannot be estimated.

An alternative hypothesis is that ERA's ability to process licenses did not improve, but rather that ERA has received a higher proportion of acceptable applications than in the past. That is to say it is possible that ERA received and processed about the same number of applications each year, but granted more licenses in recent years. If this were the case, then GET FiT's support for capacity building would be less likely to have been necessary. Data on total applications submitted will be analyzed in the next two reports in this assignment.

## **H.5 Partial Risk Guarantees**

The analysis of PRGs aimed to understand if and how the PRGs overcame the barrier of offtaker risk being too high (that is to say, the risk of power being produced but not paid for). This barrier is shown in Figure H.4.

Figure H.4: Casual Pathway for PRGs



The PRGs were offered by the World Bank to backup letters of credit from commercial banks (covering offtaker payment risk), or to commercial lenders (covering debt default risk). PRGs were expected to reduce developers' and lenders' risk perceptions by providing compensation in the event of non-payment by UETCL, and thus enable investments to be made.

However, no PRGs were used. This makes the attribution analysis very straightforward, as an intervention that was not used at all must have been unnecessary.

Castalia intended to explore why PRGs were not used through interviews and hypothesis testing with a similar approach the ones used for premium payments and standardized documents. However, once interview data were reviewed on loans to GET FiT-supported projects, that approach was simplified.

Fifteen out of 17 GET FiT projects were simply not eligible for coverage from PRGs. To be eligible for a PRG, a loan must be from a commercial bank, and in the form of project financing (that is to say, a loan directly to a specific power plant project). This contrasts with corporate financing, when a loan is made based on the overall financial strength of a company (of which a power plant project is just one part). Data on eligibility are shown in Table H.13.

Table H.13: Eligibility for PRGs

Category	Project Names	Total number of projects
<i>Ineligible for PRG</i>	<i>Total</i>	<i>15</i>
Project financing from DFI lender	3, 4, 6, 7, 10, 11, 12, 13, 14, 15, 16, 17	12
No lender	2	1
Corporate financing from commercial lender	1, 5	2
<i>Eligible for PRG</i>	<i>Total</i>	<i>2</i>
Project financing from commercial lender	8, 9	2

Source: Interviews for Castalia

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Then, most interviewees' opinions on whether the PRG was too cumbersome or costly, or posed other problems, were trivial. Such opinions are not reliable from stakeholders who were ineligible for PRGs in the first place.

As shown in Table H.13, only two projects were eligible for PRGs. Those projects have the same developer and lender. That developer and lender were asked why they did not use PRGs. They both said that the PRG was too cumbersome, and that political risk insurance was preferable. The lender intends to take out insurance from Africa Trade Insurance (ATI), a donor-backed insurer. The developer said ATI is "much more nimble" than the World Bank.

Those responses from one developer and one lender are consistent with the PRGs being too cumbersome, and with alternative instruments being preferable. However, those responses cannot be used to extrapolate general findings. Those responses come from a total of just two interviewees, and were referring to the same two projects,

It is possible that DFI lenders "crowded out" commercial banks by offering lower interest rates. Two staff from donors involved in GET FiT thought crowd out occurred. This is plausible according to Castalia's understanding of RE investment. However, crowd out cannot be meaningfully established through the evidence and analysis used in this report.

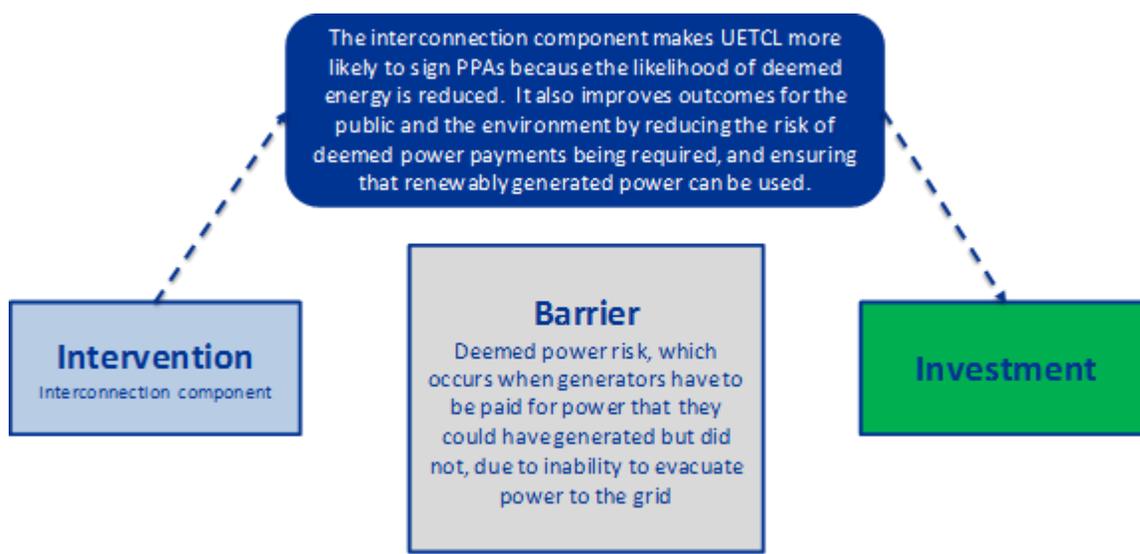
Since 12 projects received loans from DFIs without support from a PRG, it seems that DFIs did not require the PRGs. Of course, DFIs were ineligible for PRGs. If they required similar risk coverage, they would have employed some other risk mitigation instrument. No evidence of use of other risk instruments by DFIs was found.

In summary, PRGs were not used largely because GET FiT-supported projects were not eligible (15 out of 17 projects). For the other two projects which were eligible for PRGs, alternative risk coverage was preferable.

## **H.6 Interconnection component**

The analysis of interconnection aimed to understand if and how the interconnection component overcame the barrier of offtaker risk being too high (that is to say, the risk of power being produced but not paid for). This barrier is shown in Figure H.5.

Figure H.5: Casual Pathway for Capacity Building for ERA



The interconnection component helped finance infrastructure works, and coordinated the construction of infrastructure works by other donors.<sup>100</sup>

The interconnection intervention focuses on ‘deep interconnection’—that is to say, to it aims to allow power from GET FiT power plants to flow across the grid to reach load. The need for interconnection support was identified by the Joint Interconnection Task Force (JITF).<sup>101</sup> The JITF is chaired by ERA, and includes technical experts from ERA, UETCL (the operator of the transmission grid), REA, and Umeme. Following the recommendations of the JITF study, DFID’s business case for funding the interconnection component identifies a number of plants being at risk of not being to supply power due to inadequate grid capacity (deemed energy). Deemed energy would require developers to be compensated for the power they could have supplied, but did not. This is based on the JITF’s technical analysis<sup>102</sup>

The interconnection works funded by GET FiT were deemed necessary by JITF for five projects to evacuate power JITF (Ndugutu, Nyamagasani I, Nyamagasani II, Sindila, and Soroti):

- Reinforcement of the 33kV grid in Western Uganda (US\$13 million)
- Upgrading the Opuyo substation in Eastern Uganda (US\$5.8 million).

GET FiT coordinated with other donors to ensure that other works were funded that were deemed necessary by JITF for five other projects (Kyambura, Lubilia, Nyamwamba, Rwimi, and Siti II):

- Extension of the Mbale-Bulambuli 132kV transmission line (up to EUR40 million, funded by the European Union)

<sup>100</sup> The interconnection component also provided capacity building on interconnection. That capacity building has not yet begun, so it will be analyzed in the next two reports in this engagement.

<sup>101</sup> GET FiT Annual Report 2015

<sup>102</sup> These power plants are shown in Appendix H.6

- Upgrading the Nkenda substation (cost unknown, to be funded by the World Bank)

Castalia changed its planned approach to studying interconnection, similar to how the approach to capacity building was changed. Developers were interviewed about interconnection, including on if they were aware of potential interconnection problems for their projects, and if the interconnection component's interventions would help solve those problems. However, developers' opinions on interconnection were removed from this analysis, as their opinions are not reliable. Developers, who focus on their own projects, necessarily do not have near as comprehensive a view of the grid as JITF (which includes the key agencies in power sector planning). Then, it was decided to rely primarily on an engineering review of the JITF recommendations, to see if they were technically sound. The need for interconnection support is a pure question of engineering.

The evaluation team's electrical engineer independently reviewed the JITF's technical report as part of this evaluation ("Power Evacuation and Interconnection Study for the GET FiT Projects", from January 2015). In summary, he found that the JITF report correctly:

- Identified power plants that required interconnection support
- Proposed sound technical options to provide interconnection support

The engineer reviewed the assumptions and simulations that supported the analysis, and found them reasonable and well done. The works are likely necessary and sufficient to allow for evacuation of power over the longer term. Since GET FiT either funded those works or coordinated funding of those works by other donors, GET FiT's interconnection component is likely necessary for those power plants to evacuate power in the long run.

Three UETCL staff were interviewed who work closely with GET FiT (Valentine Katabira, George Rwabajungu, and Boneventura Buhanga). These three staff were referred to as UETCL's "GET FiT Committee" by UETCL's CEO. The GET FiT Committee said UETCL would not sign more PPAs without the support for interconnection infrastructure. The interconnection infrastructure (the works funded by GET FiT and coordinated by GET FiT) was required to minimize the risk of deemed power obligations. However, those interviews did not result in a detail explanation of how UETCL would be harmed by deemed power—this is not immediately obvious, since the PPA and IA put the financial obligation to pay for deemed energy with the Government, not UETCL.

Nonetheless, UETCL may have wanted to avoid deemed energy to improve the general attractiveness of the energy sector for investment.<sup>103</sup> Although the PPA and IA provide for developers to be compensated for deemed power, it would be best if deemed power were minimized. Over the long run, investors could question the Government's ability to make large deemed power payments, and find the Ugandan market less attractive.

The UETCL staff also said that UETCL generally has to request transfers of funds from the national government to fund works. This indicates that UETCL probably would not have been able to fund the interconnection works on its own. UETCL's strategic investments are largely funded by transfers from donors. These include the World Bank, African Development Bank, French Agency for Development (AFD), Japan International Cooperation Agency, East African Community, Islamic Development Bank, and the governments of China and Norway.

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<sup>103</sup> This is speculative, based on the evaluator's understanding of electricity sectors in emerging markets.

It is then likely that the 10 power plants that were identified for donor support with interconnection works required donor support to have those works built,

Since the engineering review indicted that the JITF recommendations were sound, the intervention component was likely necessary for the 10 projects that JITF said required interconnection support. These projects should be attributed to GET FiT because GET FiT made significant contribution to identifying the need for interconnection, funded some interconnection works, and coordinated with other donors to ensure other works were funded.

## Appendix I: Technical Approach to Performance Review Questions

This section explains Castalia's approach to the Performance Review Questions (PRQs). The PRQs are listed in Table I.1

**Table I.1: List of Performance Review Questions**

Number	Question	Section
PRQ1	To what extent have the output targets and milestones been met?	4.1
PRQ1b	To what extent have the outcome and impact targets and milestones been met?	4.1
PRQ2, 2a 2b, and 4*	What have been the key challenges and opportunities in program delivery?	4.2
PRQ1a	What was the level of attribution of change to each of the donors of the program?	5.3.1
PRQ3	What other programs are being implemented that could have led to the same outputs?	6.2
PRQ6	Was GET FiT an appropriate model to deliver the intended outcomes?	7.1
PRQ6a	Did the FiT tendering arrangements work and what lessons can be learnt from them?	7.2
PRQ6b	Was the choice and arrangements with the implementation consultant appropriate (again lessons for the future)?	7.3
PRQ5	What systems and processes are in place to effectively deliver the intended results and learn lessons?	8.1
PRQ7 (a,b,c,d)*	What lessons can be learned from the interaction between the World Bank guarantee insurance and the GET FiT program?	8.2

\*Note: These combined questions were created because the included sub-questions are closely related. The best analytical approach was to discuss the sub-questions together.

These questions were answered differently from the Evaluation Questions, although PRQs sometimes relied on some findings from the Evaluation Questions. The approach to each question is detailed in Table I.2.

**Table I.2: Approach to Performance Review Questions**

Number	Question	Data	Approach
PRQ1	To what extent have the output targets and milestones been met?	<ul style="list-style-type: none"> <li>▪ Logframe indicators from Multiconsult, GET FiT’s monitoring consultant</li> <li>▪ Interviews with developers, equity investors, and lenders</li> </ul>	<ul style="list-style-type: none"> <li>▪ Castalia compared the reported results in the logframe against the milestones (goals) that were to be met. Each indicator was coded as having met or exceeded the milestone; close to meeting the milestone (within 80 percent); or not close to meeting the milestone (less than 80 percent)</li> <li>▪ Summary statistics were calculated to show how often milestones were met, close to being met, or not close.</li> <li>▪ Some indicators were verified through interviews with developers, investors, and lenders. These indicators were chosen because they are the most useful in understanding GET FiT’s progress in delivering power plants, and should be useful in the future reports in this engagement in tracking GET FiT’s progress over time. The indicators are:               <ul style="list-style-type: none"> <li>– Installed capacity (reached COD), total</li> <li>– Power delivered to national grid per year</li> <li>– Number of GET FiT-supported projects that have reached COD</li> <li>– Number of technologies supported by GET FiT</li> <li>– Private finance mobilized for GET FiT (financial close)</li> <li>– Public finance mobilized for GET FiT (financial close)</li> </ul> </li> <li>▪ Indicators were not verified through random sampling, as proposed in the Inception Report. The evaluators decided that picking the most important indicators, and verifying all reported data for them, would be the most beneficial approach.</li> <li>▪ In answering this question, logframe results were not attributed to GET FiT. That was done in EQ1a and PRQ1a.</li> </ul>
PRQ1b	To what extent have the outcome and impact targets and milestones been met?	<ul style="list-style-type: none"> <li>▪ Logframe indicators from Multiconsult, GET FiT’s monitoring consultant</li> </ul>	<ul style="list-style-type: none"> <li>▪ Castalia compared the reported results in the logframe against the milestones (goals) that were to be met. Each indicator was coded as having met or exceeded the milestone; close to meeting the milestone (within 80 percent); or not close to meeting the milestone (less than 80 percent)</li> <li>▪ Summary statistics were calculated to show how often milestones were met, close to being met, or not close.</li> </ul>

Number	Question	Data	Approach
PRQ2, 2a 2b, and 4	What have been the key challenges and opportunities in program delivery?	<ul style="list-style-type: none"> <li>▪ GET FiT’s annual reports</li> <li>▪ Interviews with developers, equity investors, and lenders</li> <li>▪ Reports on the Ugandan agricultural sector, and biomass and bagasse generation</li> </ul>	<ul style="list-style-type: none"> <li>▪ In answering this question, logframe results were not attributed to GET FiT. That will be done in the next two reports in this engagement.</li> <li>▪ Important challenges were first identified in GET FiT’s annual reports</li> <li>▪ Developers, equity investors, and lenders were asked about challenges that their projects faced               <ul style="list-style-type: none"> <li>– Those interviewees generally reported the same challenges as were found in GET FiT’s annual reports, and described those challenges similarly.</li> </ul> </li> <li>▪ For all challenges, evidence from the annual reports and interviews was used to create a narrative of what happened, including: what was the challenge; how did effect the program; and how did GET FiT respond to the challenge. For some challenges, additional evidence was collected.</li> <li>▪ For the challenge of exchange rate variation, data were collected via email on what currencies developers borrow in. This was done after the interviews, because the need for it was identified after the interviews were completed. This helped show how developers could be affected by exchange rate variation, by receiving premium payments in a currency different from the currency with which they repay loans</li> <li>▪ The head of Castalia’s Africa RE transaction advisory practice was consulted on the issue of low technological diversity. He confirmed the evaluators’ opinion that bagasse and biomass power plants are generally built by large agribusinesses.               <ul style="list-style-type: none"> <li>– A leading report on biomass and bagasse generation by IRENA was reviewed to identify commonly used fuels</li> <li>– A report on the Ugandan agricultural sector was reviewed, to see how many large agribusinesses are in Uganda, and working with crops commonly used as fuels for power generation.</li> <li>– The pool of agribusinesses likely to developer power projects was compared to the pool of bids to GET FiT, and projects in the GET FiT portfolio. This found that, contrary to the evaluator’s expectations, GET FiT actually did well in drawing in biomass and bagasse projects given the scarcity of large agribusinesses in Uganda.</li> </ul> </li> <li>▪ No opportunities were identified, as defined in Section 4.2</li> </ul>

Number	Question	Data	Approach
PRQ1a	What was the level of attribution of change to each of the donors of the program?	<ul style="list-style-type: none"> <li>▪ Attribution findings from EQ1a</li> <li>▪ Logframe results from PRQ1 (outputs) and PRQ1b (outcomes)</li> <li>▪ GET FiT’ Annual Report 2016</li> </ul>	<ul style="list-style-type: none"> <li>▪ Since EQ1a found that all power plants are attributable to GET FiT, all results in the logframe were attributable to GET FiT.</li> <li>▪ Logframe indicators were identified from PRQ1 and PRQ1b that could be meaningfully apportioned across donors, in accordance with the Key Performance Indicator methodology of the United Kingdom’s International Climate Fund (ICF). Those indicators are: <ul style="list-style-type: none"> <li>– Installed capacity (reached COD)</li> <li>– Power delivered to national grid</li> <li>– Private finance mobilized for GET FiT (financial close)</li> <li>– Private finance mobilized for GET FiT (financial close)</li> <li>– Number of direct national jobs created by power plants</li> </ul> </li> <li>▪ In accordance with ICF Methodology, results were apportioned across donors by their relative funding contribution. Funding contributions were found in the GET FiT Annual Report 2015. For example, since Norway provided 17 percent of program funds, it received 17 percent of the total installed capacity that has reached COD (4.2MW).</li> <li>▪ Many indicators could not be meaningfully divided across donors—for example, it would not be meaningful for each donor to claim a portion of the number of technologies supported by GET FiT (three technologies).</li> </ul>
PRQ3	What other programs are being implemented that could have led to the same outputs?	<ul style="list-style-type: none"> <li>▪ Interviews with KfW, and staff of donors active in Uganda</li> <li>▪ Desk research on reports about the Ugandan energy sector, and donor programs in Uganda</li> </ul>	<ul style="list-style-type: none"> <li>▪ Castalia compiled a list of donor programs in energy in Uganda, that provide outputs similar to GET FiT (either RE power generation, or grid works). This list was built by: <ul style="list-style-type: none"> <li>– Asking donors about their activities in Uganda</li> <li>– Research on donor websites (World Bank, AfDB, KfW, GIZ)</li> <li>– Reading background reports on the Ugandan energy sector</li> <li>– Reviewing the business case for GET FiT’s interconnection component</li> </ul> </li> <li>▪ The programs were then described in terms of what outputs they provide, and these outputs were compared with GET FiT’s to see if there could be any overlap (for example, two programs helping build small hydropower projects that sell power to UETCL).</li> </ul>

*Confidential*

Number	Question	Data	Approach
PRQ6	Was GET FiT an appropriate model to deliver the intended outcomes?	<ul style="list-style-type: none"> <li>▪ Attribution findings from EQ1a</li> </ul>	<ul style="list-style-type: none"> <li>▪ The attribution findings were used to see if GET FiT’s interventions seemed to address barriers to investment in RE.</li> <li>▪ GET FiT’s interventions were compared with other programs supporting RE in African and other emerging markets. GET FiT was found to stand out because it offered a set of interventions that addressed all major barriers from lenders’ and investors’ point of view. Many other programs only address some (for example, offering standardized contracts and subsidies, but not creating a working arrangement for procuring power plants).</li> </ul>
PRQ6a	Did the FiT tendering arrangements work and what lessons can be learnt from them?	<ul style="list-style-type: none"> <li>▪ Interviews with KfW and Multiconsult</li> <li>▪ The review of GET FiT’s solar tender by Anton Eberhard</li> <li>▪ Interviews with developers</li> </ul>	<ul style="list-style-type: none"> <li>▪ Castalia judged the value of the general structure of the tendering arrangement (having KfW and consultants largely run the tender) based on knowledge of RE tendering. This was compared against the option of having the Government more actively involved in the tender, which could have enabled greater capacity building.</li> <li>▪ Specific critiques of the tenders were identified in interviews with developers, and in the review of the solar tender. The evidence of those critiques was presented to describe the problems. Castalia also provided its own opinions based professional experience.</li> </ul>
PRQ6b	Was the choice and arrangements with the implementation consultant appropriate (again lessons for the future)?	<ul style="list-style-type: none"> <li>▪ Interviews with KfW and Multiconsult</li> <li>▪ Interviews with ERA staff</li> <li>▪ Interviews with donor staff</li> </ul>	<ul style="list-style-type: none"> <li>▪ The central aspect of the implementation arrangement was putting execution of the program solidly in the hands of the GET FiT Secretariat (staffed by Multiconsult), and KfW. This was analyzed in terms of the benefits and drawbacks for KfW and the Government of Uganda.</li> <li>▪ Interviews with KfW, Multiconsult, and ERA staff, and staff of other donor agencies yielded a range of opinions on the benefits and drawbacks of putting more, or less, control over execution in the hands of the Government.</li> <li>▪ These opinions were then synthesized, along with Castalia’s professional knowledge, to find important benefits and drawbacks of the implementation arrangement.</li> </ul>
PRQ5	What systems and processes are in place to effectively deliver the	<ul style="list-style-type: none"> <li>▪ Interviews with KfW and Multiconsult</li> <li>▪ GET FiT annual reports</li> <li>▪ GET FiT’s business case</li> </ul>	<ul style="list-style-type: none"> <li>▪ GET FiT planning documents (business case, Monitoring and Evaluation Framework) were used to identify what GET FiT intended to do for learning and delivering results (“delivering results” was understood to mean monitoring results, and adapting to events over time)</li> <li>▪ Interviews and annual reports were used to identify GET FiT’s actual practices</li> </ul>

Number	Question	Data	Approach
	intended results and learn lessons?	<ul style="list-style-type: none"> <li>▪ GET FiT's Monitoring and Evaluation Framework</li> <li>▪ Logframe reporting from Multiconsult</li> </ul>	<ul style="list-style-type: none"> <li>▪ Actual practices were compared with planned practices to see if GET FiT tried to do what it said it would do</li> <li>▪ The actual and planned practices were compared with the project cycle presented in the Inception Report as a model of good practice</li> </ul>
PRQ7 (a,b,c,d)	What lessons can be learned from the interaction between the World Bank guarantee insurance and the GET FiT program?	<ul style="list-style-type: none"> <li>▪ Attribution findings from EQ1a</li> <li>▪ Interviews with World Bank staff</li> <li>▪ Review of World Bank documents on PRGs</li> </ul>	<ul style="list-style-type: none"> <li>▪ Lessons on why PRGs were not used were found in the analysis of attribution for PRGs</li> <li>▪ We interviewed World Bank staff who worked with PRGs to elicit their opinions on why PRGs were not used, and better understand the PGR offering</li> <li>▪ World Banks documents (the PGR Project Appraisal Document, and a flyer explaining the PGR offering) were also reviewed to better understand the PGR offering.</li> </ul>

### Limitations of approach to performance review questions

The limitations of the approach to performance review questions are shown in Table I.3

**Table I.3: Limitations for Performance Review Questions**

Question	Comment
PRQ1	<p>Logframe data were largely provided by Multiconsult, unless otherwise noted in Section 4.1. Castalia has no reason to doubt the quality of data from Multiconsult. Nonetheless, some output indicators were verified. Castalia chose indicators for verification which are the most important in tracking GET FiT's progress in supporting power plants, and in enabling the intended impacts.</p> <p>This was not a sampling approach to verification. It is possible that some other data were not provided by accurate by Multiconsult (though Castalia has no reason to think this the case). Outcome and Impact indicators will be verified in the future reports in this engagement.</p>
PRQ2 (IFC PS)	<p>This question relies on interviews, in particular for discussion of IFC PS. Then, this question is subject to the same limitations that attribution faces when using interviews (see 0). Developers have an incentive to exaggerate how strict or demanding GET FiT was in applying IFC Performance Standards, in the hope that the standards will be applied more loosely in the future. All else being equal, developers spend less on compliance when standards are looser. (consultants, engineering works, and so forth). Spending less on compliance would lower developers' costs, and increase their profits.</p> <p>To address this inherent bias, Castalia weighted the responses of developer against those of KfW and its consultants. Castalia also relied on more objective interview responses when possible. One example of such a response is a developer saying that GET FiT rejected an environmental and social report which was acceptable to a DFI which complies with IFC PS. This shows that GET FiT is at least more demanding than one other DFI.</p>
PRQ2 (tech. diversity)	<p>The analysis of lower technological diversity would have been benefited from an interview with a bagasse developer which did not submit a bid to GET FiT. One such potential interviewee was identified, but did not respond to requests for an interview.</p>
PRQ6	<p>The assessment of whether GET FiT was an appropriate model is based on Castalia's professional judgment and experience working with private investment in RE. Castalia feels this was a good approach to this question. Nonetheless, it should be noted that the answer to this question is very much a reflection of Castalia's experience and opinions.</p>
PRQ7(a-d)	<p>The analysis of PRGs is heavily affected by the fact that no PRGs were used. Fifteen out of 17 GET FiT-supported power plants were simply not eligible, because they did not have project-specific loans from commercial banks. Only two power plants, with the same developer and lender, were eligible. Had there been more eligible projects, it may have been possible to develop deeper findings on what risk mitigation instruments would be better than PRGs, and why. However, because there were so few power plants eligible for PRGs, there was necessarily a limited set of interviewees who could opine on other risk mitigation instruments in an analytically useful way.</p> <p>It was also not possible to find useful insights on the experience of PRGs for small RE elsewhere, as none have been issued yet. One is expected to be issued in Maldives. Had there been an existing track record of uptake of</p>

Question	Comment
	PRGs small PRGs elsewhere, it may have been possible to compare those with GET FiT's PRGs, and identify potential improvements to GET FiT's PRGs.

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## **Appendix J: Technical Approach to Surveys**

The sample is intended to provide a snapshot of how GET FiT power plants affect households and SMEs (small and medium enterprises) in nearby communities. The sample is not being used for a randomized controlled trial (RCT) analysis.

We chose two GET FiT sites in different parts of the Uganda that: (1) have poor electricity service due to weak interconnection, and (2) are positioned in the grid such that they could experience improved service from power plants supported by GET FiT.

This is important because GET FiT aims to improve grid stability and reliability of supply by supporting small power plants in different parts of the country. Grid stability can only be improved in parts of the grid that are weakly interconnected. In well interconnected areas (such as the Kampala-Jinja-Entebbe area), there less need for such improvement.

We identified these sites in consultation with Rural Electrification Agency (REA). REA staff identified a large number of power plants supported by GET FiT that are in weakly interconnected areas. We then identified three of those power plants that are relatively far progressed in construction, in consultation with the GET FiT secretariat. Two of those plants were in Western Uganda, and one in Eastern Uganda. We chose one in Western Uganda, and one in Eastern Uganda, to study disparate parts of the power grid. These regions also have different economic development prospects over the long term, as oil reserves are concentrated in Western Uganda.

We chose one non-GET FiT site that also has poor electricity service due to weak interconnection, but is positioned such that it cannot experience localized effects of improved service from GET FiT power plants. This is not a control in the traditional sense of experimental survey methodology. This non-GET FiT site is in Western Uganda, which could allow for interesting comparisons with the GET FiT site in Western Uganda. This non-GET FiT site was chosen because it would have a similar economic development trajectory to the GET FiT site in Western Uganda, and it incurs a lower logistics cost for our work, as it is relatively close to the GET FiT site.

Some questions in the questionnaires (see 0) were not asked during this round of surveys. They will be incorporated in the next two surveys in this engagement. These questions were added to the questionnaire after the field work had already been completed in November 2015. Those questions are:

- A question to schools and medical centers on how they are affected by not having power
- A question to households on who collects fuel
- A box for “other comments” at the end of all questionnaires.

The sites, and the number of surveyed respondents, are shown in Table J.1. One of the GET FiT sites is a town (near the Sindila power plant), and the other is a village (near the Siti power plant). These are the nearest settlements to those power plants. The non-GET FiT site (Kagadi, in the Kibaale District) is also a town.

The target number of respondents was 50 households (HH) and 50 SMEs in each site. This means a total of 150 HH and 150 SMEs were targeted across the three sites. These target numbers are based on the constraints of time and budget. The surveys are only being used to create narrative snap shots, rather than for drawing econometrically robust findings.

The individual households and SMEs were chosen as follows:

- Siti had a linear settlement area. Enumerators were dropped at different points by car. To diversity of respondents, each enumerator spoke with no more than three retail SMEs in any one Local Council area (the smallest administrative unit). Retail shops were the predominant type of SME. Enumerators also avoided interviewing more than two SMEs or two households in any one block.
- Sindila and Kagadi (the non-GET FiT site) had clustered settlement areas. In these sites, enumerators were dropped in different points near the edge of the settlement, and took different paths towards the center. Enumerators also avoided interviewing more than two SMEs or two households in any one block.

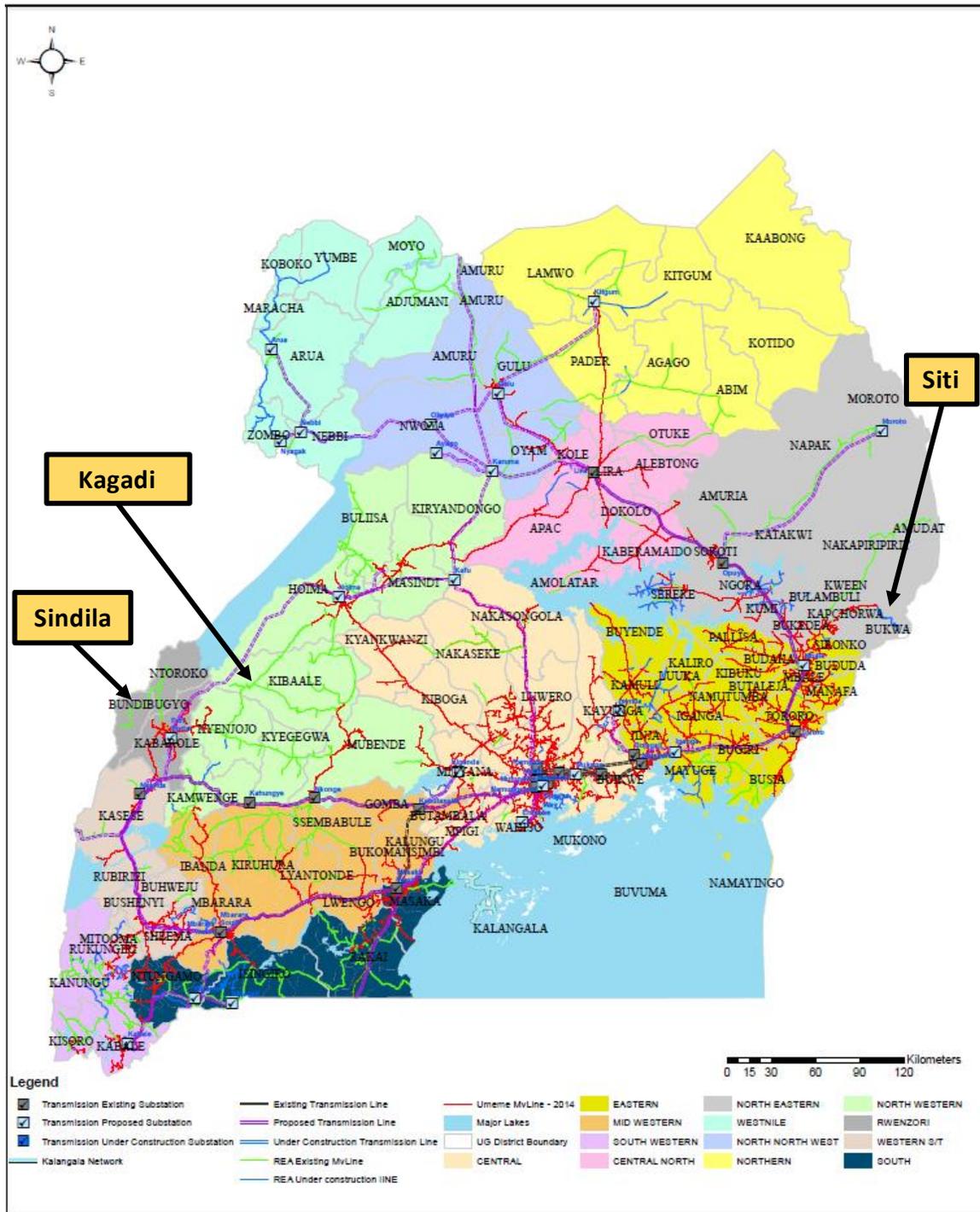
Enumerators asked questions of the respondents verbally, and record data on paper questionnaires. The enumerators will spoke both English and Luganda (the indigenous lingua franca in Uganda).

Respondents were not drawn from a sampling frame (for example a list of residents or businesses in the area). This was seen as impractical given logistical constraints. A description of the sample is shown in Table J.1.

Table J.1: Quantitative Survey Sites and Sample

District	Locality	Region	GET FiT Site	GET FiT Power Plant Nearby	Poor service due to weak interconnection	GET FiT power plants could improve service	Count of HH Surveys	Count of SME surveys
Bundibugyo	Bundibugyo Town	Eastern	✓	Sindila	yes	yes	54	53
Bukwo and Kween (bordering)	Chesoweri Village	Western	✓	Siti	yes	yes	49	50
Kibaale	Kagadi Town	Western		-	yes	no	51	50
Total	-	-		-	-	-	154	153

Figure J.1: Map of Survey Sites



Source: The map of the Ugandan grid was received from the Uganda Rural Electrification Agency. The survey sites were added by Castalia.

### **Limitations to survey approach**

The **consumer surveys are not representative** of GET FiT as a whole, and thus cannot be extrapolated to measure national economic benefits. This analysis will be conducted in the future reports in this engagement. This report only contains baseline data. The two GET FiT sites were chosen in part because they are far along in construction, and thus more likely to produce power during the course of this evaluation engagement. To address this, we are limiting the use of these surveys to preparing case studies of how GET FiT impacted a few communities, rather than extrapolating findings about the Ugandan energy sector as a whole.

Also, quota sampling was used to select interviewees within the sites (for example approaching a certain number of shops in each block). This does create potential for bias, because it is not guaranteed to be representative (for example, the sample could be biased towards shops that were open when the enumerators were working).

One non-GET FiT site was chosen in Western Uganda, which does not have a GET FiT-supported power plant. This could allow for some interesting comparisons with the other site in Western Uganda, near the Sindila power plant. This would not necessarily allow for meaningful comparison with the site in Eastern Uganda, near the Siti power plant.

Given the limited representativeness of these sites for the GET FiT portfolio, rigorous statistical experimentation (for example randomized controlled trials) cannot be used.

The survey will not be used to extrapolate conclusions at the national level. The survey will be used to create illustrative case studies of the three sites over time.

## Appendix K: Survey Results

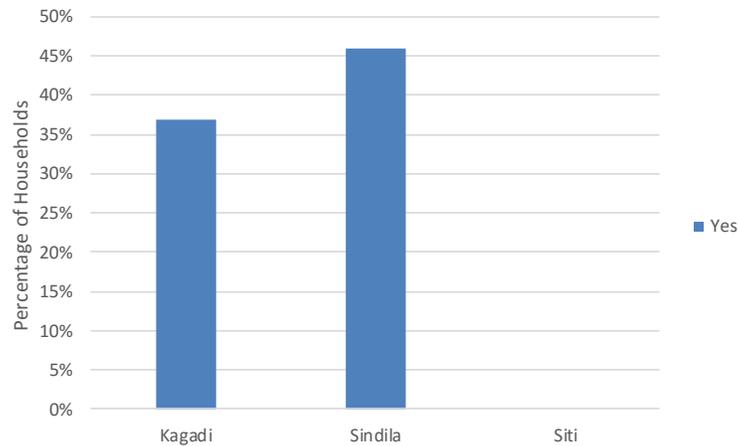
This Appendix shows the findings from the survey of consumers of electricity. An overview of the responses to each question is shown. The results from the household survey are shown first. These are followed by the results from the SME survey.

The survey methodology and sampling approach is described in 0.

### K.1 Households

Figure K.1 shows the percentage of households reporting that they have grid-connected electricity.

**Figure K.1: Households with Access to Electricity**

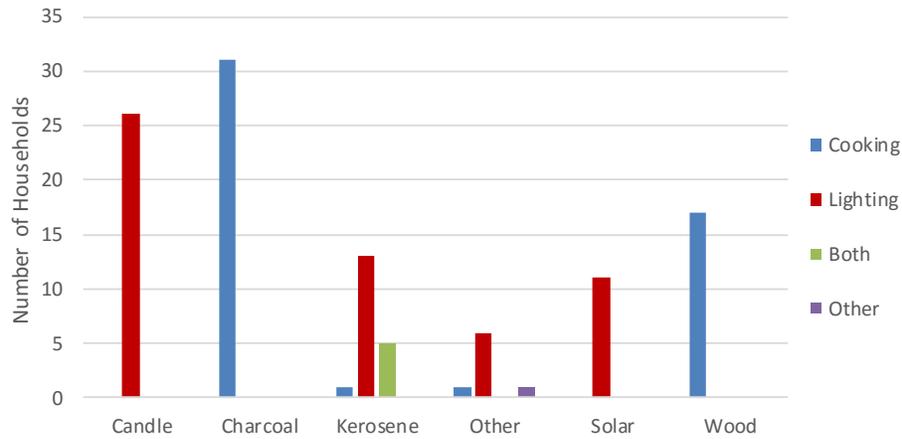


Source: Castalia Household Survey question 1

In Kagadi and Sindila, 37 percent to 46 percent of households reported having grid-connected electricity. In Siti, there is no electricity access.

Figure K.2 shows how households use energy sources other than electricity.

**Figure K.2: Uses for Energy Sources Other than Grid-Connected Electricity**

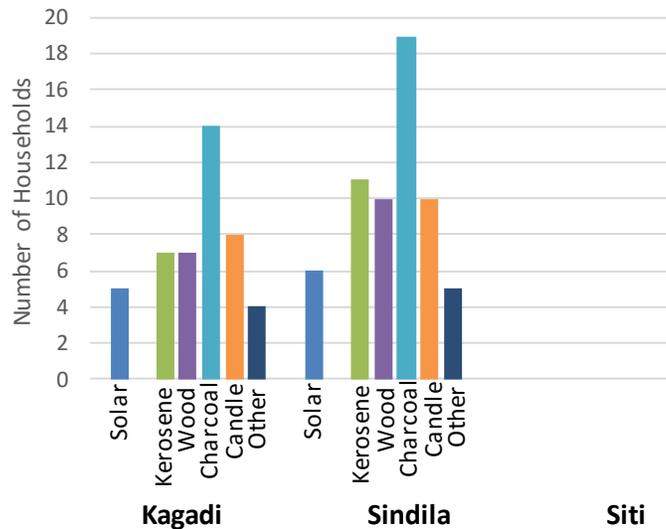


Source: Castalia Household Survey Question 6

Households in all three sites report that wood and charcoal are used only for cooking, and candles and solar are used only for lighting. Kerosene and Other sources are reported as mixed use.

Figure K.3 shows the prevalence of non-electrical energy sources used by households that do have electricity.

**Figure K.3: Prevalence of Energy Sources Other than Grid Electricity**

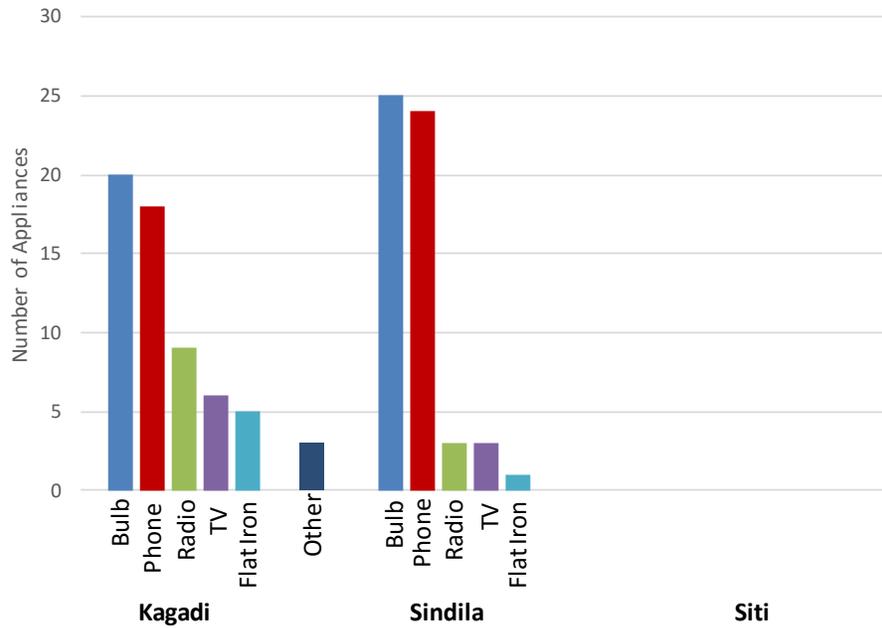


Source: Castalia Household Survey Question 6. No households from Siti are shown, because no households there have electricity.

In Kagadi and Sindila, charcoal was the most common energy source other than grid-connected electricity, followed by kerosene, candles and wood.

Figure K.4 shows the prevalence of electrical appliances in households with grid connections.

**Figure K.4: Households Reporting Use of Electrical Appliances**

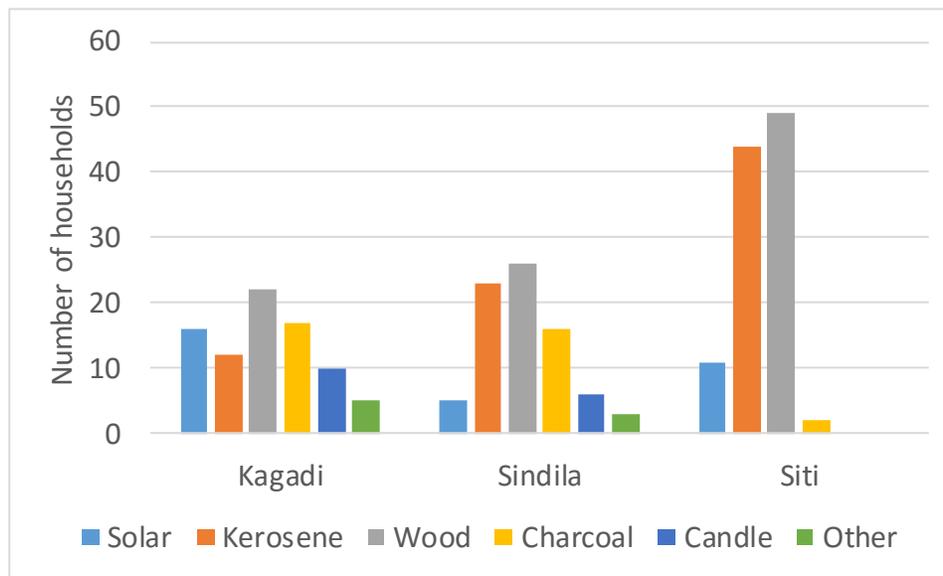


Source: Castalia Household Survey Questions 2 and 3. No households from Siti are shown, because no households there have electricity.

In Kagadi and Sindila, lightbulbs and phones are the most common appliances.

Figure K.5 shows the prevalence of energy sources used by households that do not have grid connections.

**Figure K.5: Prevalence of Energy Sources Other than Grid-Connected Electricity**

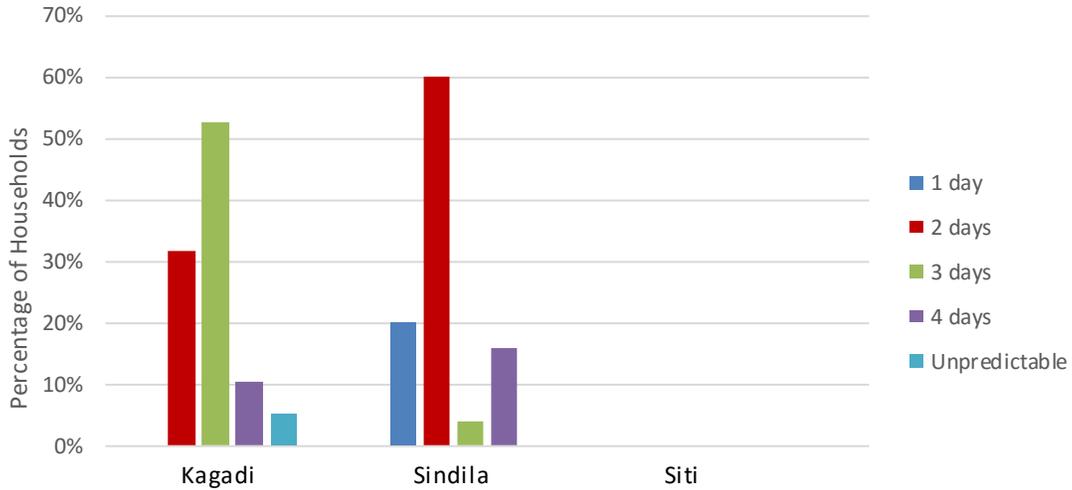


Source: Castalia Household Survey Question 12

In Kagadi, Sindila and Siti, wood is the most prevalent energy source other than grid-connected electricity, followed by kerosene.

Figure K.6 shows the days per week that households are without power in sites with grid-connected electricity access.

**Figure K.6: Days per Week Without Power as Reported by Households with Grid-Connections**

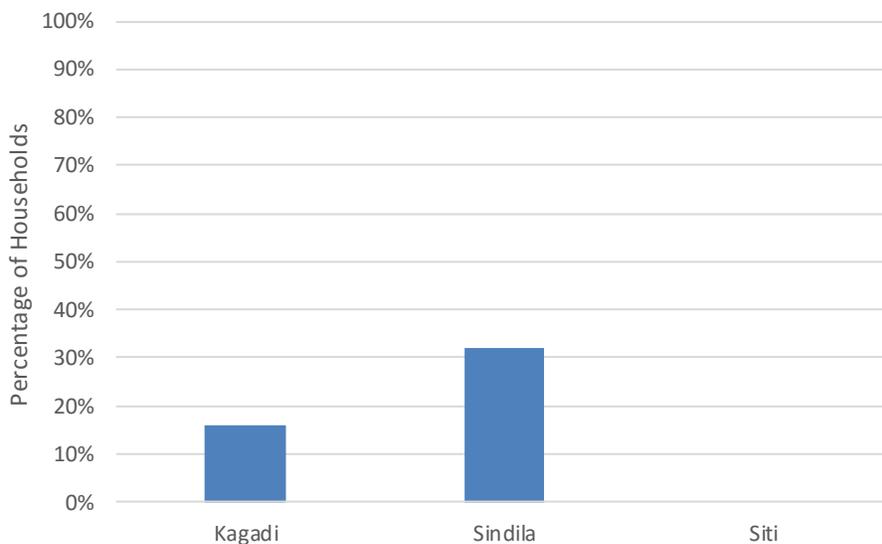


Source: Castalia Household Survey Question 4

A majority of respondents in Kagadi and Sindila were without grid-connected power for 2 or 3 days per week.

Figure K.7 shows the percentage of households with stable power (that is to say that power is of consistent quality when it is being supplied).

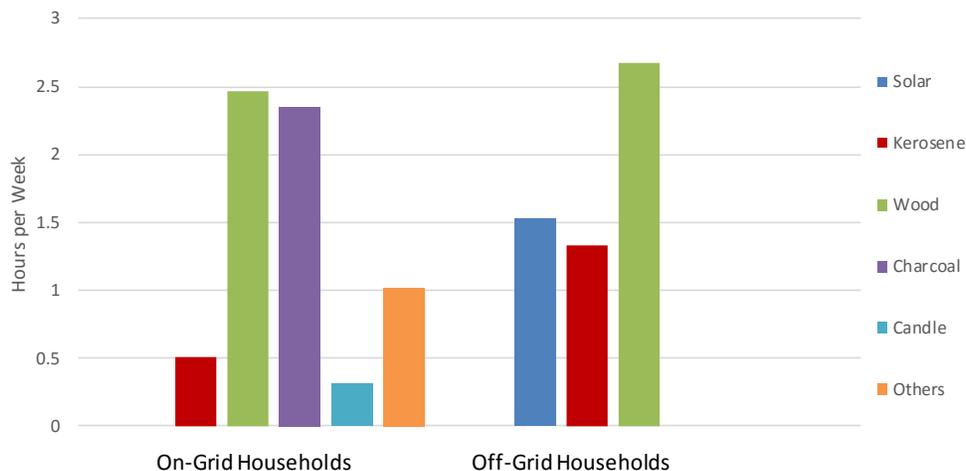
**Figure K.7: Stability of Electricity as Reported by Households with Grid Connections**



Source: Castalia Household Survey Question 5

In Kagadi and Sindila, power was reported as stable by 15 percent to 30 percent of households. Figure K.8 shows an average of the time per week spent gathering energy sources.

**Figure K.8: Time Spent Gathering Non-Grid-Connected Electricity Sources of Energy in On-Grid and Off-Grid Households**

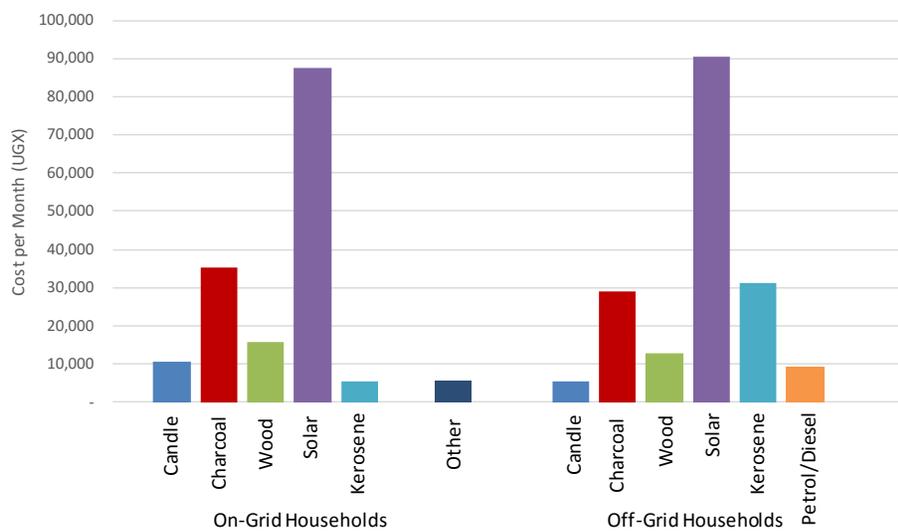


Source: Castalia Household Survey Question 6 and 12

In on-grid households in Kagadi and Sindila, wood and charcoal are reported to be the most time-consuming energy sources to gather, each taking almost 2.5 hours per week. In off grid households in all three sites, households reported that gathering wood was the most time consuming energy source.

Figure K.9 shows the average cost per month of energy sources other than grid-connected electricity, for households with grid connections.

**Figure K.9: Average Monthly Spending on Energy Sources Other than Grid-Connected Electricity in On-Grid and Off-Grid Households**

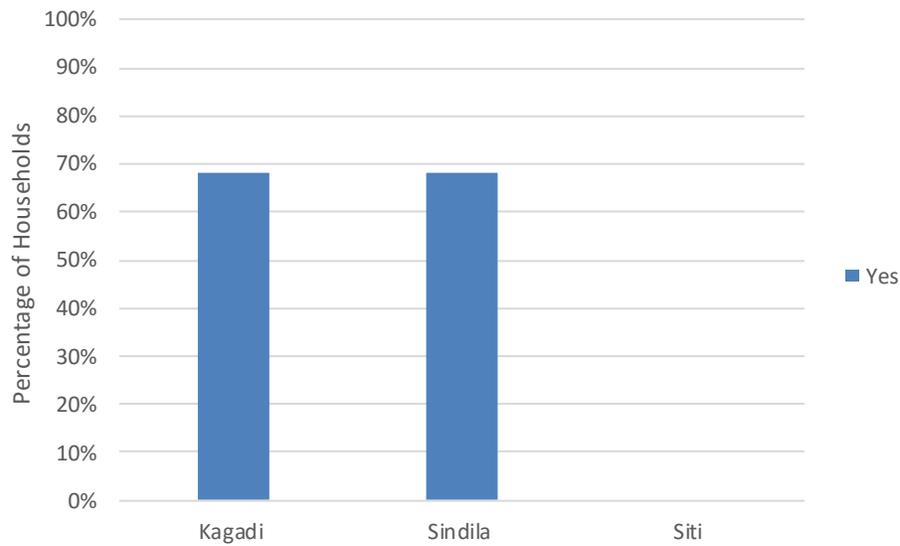


Source: Castalia Household Survey Question 6

Households report that solar is the most expensive non-grid-connected electricity source of energy, at a cost of almost UGX 90,000 per month. Also, the monthly expenditure on kerosene is significantly higher in off-grid households than it is in on-grid households. That difference is consistent with the fact that kerosene (when used for lighting) is a substitute for grid-connected electricity. So, as access to grid-connected electricity decreases, kerosene expense increases.

Figure K.10 shows the percentage of households reporting that they have students in residence.

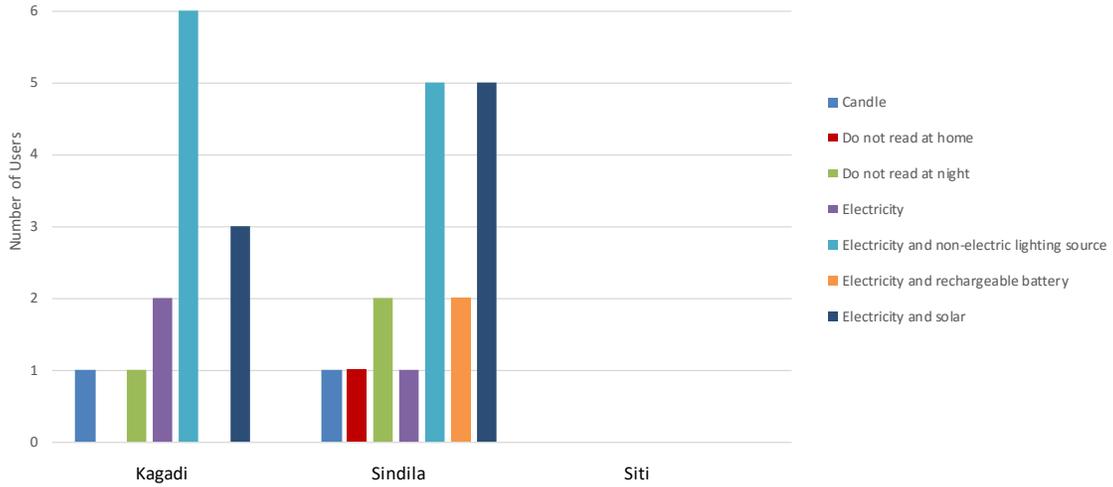
**Figure K.10: Households Reporting Students in Residence in Grid-Connected Households**



Source: Castalia Household Survey Question 7

In Kagadi and Sindila, almost 70 percent of households reported having students in residence. Figure K.11 shows what energy sources are used to provide lighting for studying.

**Figure K.11: Energy Sources Other Than Grid-Connected Electricity Used for Study**

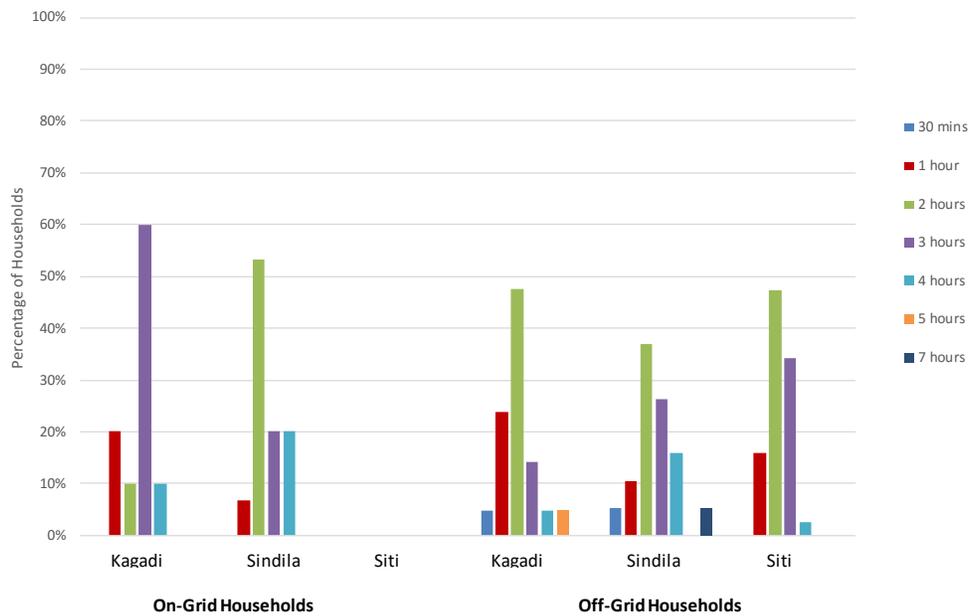


Source: Castalia Household Survey Question 8

In Sindila and Kagadi, the most common sources of lighting are solar, and grid-connected electricity with non-electric lighting sources.

Figure K.12 shows the percentage of households reporting the number of hours that students spend on homework.

**Figure K.12: Reported Time Spent on Homework per Day in On-Grid and Off-Grid Households**



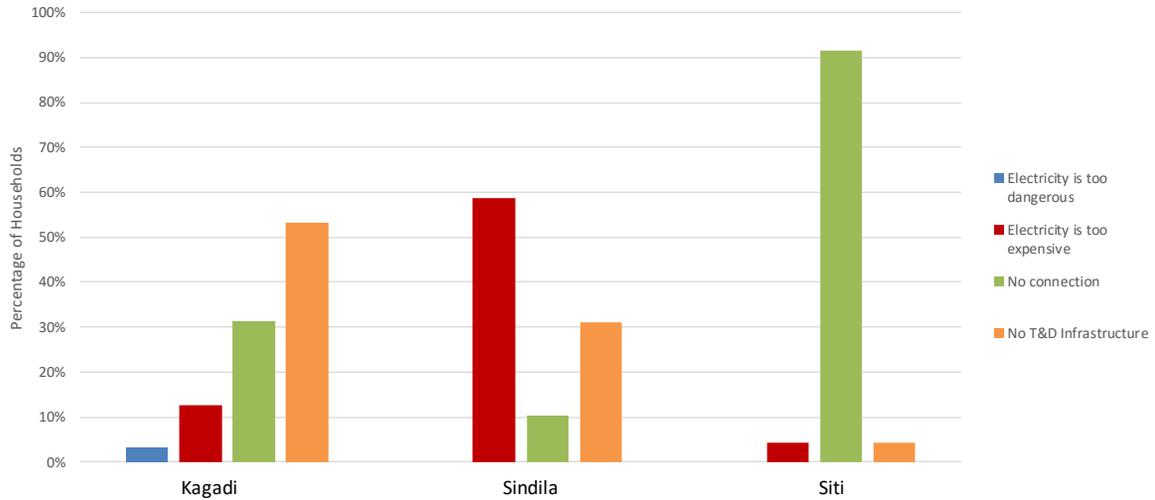
Source: Castalia Household Survey Question 9 and 16

In on-grid households in Kagadi and Sindila, a majority report that students spend 2 or 3 hours per night on homework. In off-grid households in all three sites, 35 percent to 47 percent of

households report that students spend 2 hours on homework, followed by 15 percent to 34 percent reporting that students spend 3 hours on homework.

Figure K.13 shows the percentage of households reporting the reasons why they do not access to grid-connected electricity.

**Figure K.13: Households Without Grid-Connections Reporting Reasons Why They Lack Access to Grid-Connected Electricity**

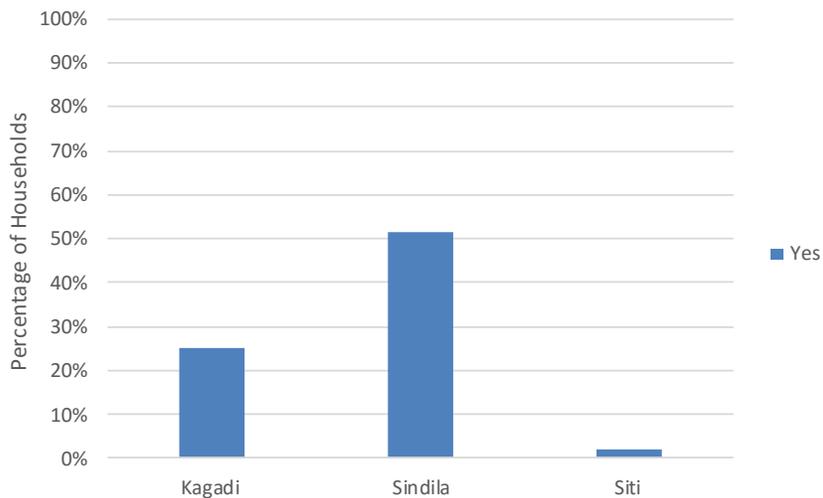


Source: Castalia Household Survey Question 10

In off-grid households in Kagadi and Sindila, a majority report the lack of transmission and distribution infrastructure and the expense of electricity as the reason why they lack access to electricity. In Siti, a majority of households report that they lack grid connections and so do not have access to electricity.

Figure K.14 shows the percentage of households reporting that their neighbors have access to grid-connected electricity.

**Figure K.14: Households Without Grid-Connections Reporting Neighbors with Grid-Connected Electricity Access**

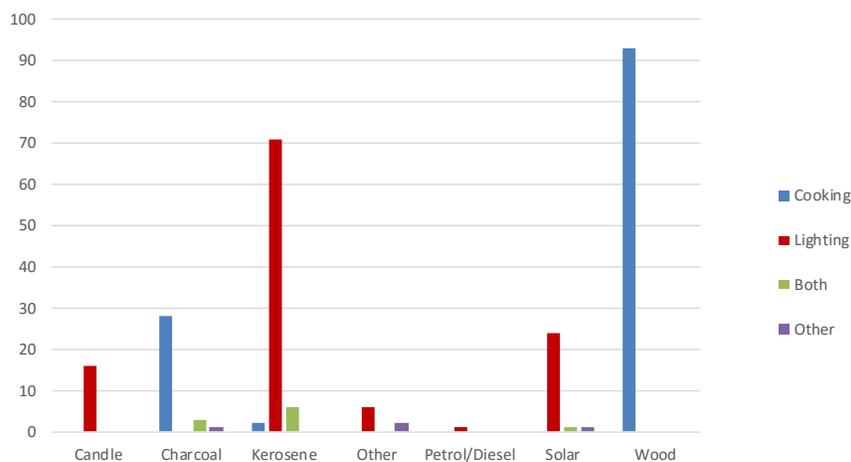


Source: Castalia Household Survey Question 11

In Kagadi and Sindila, 45 percent and 70 percent of households report that their neighbors do not have access to grid-connected electricity. In Siti, almost 100 percent of households report that their neighbors do not have access to grid-connected electricity.

Figure K.15 shows the prevalence of uses for energy sources other than grid-connected electricity.

**Figure K.15: Uses for Energy Sources in Grid-Connected Households**

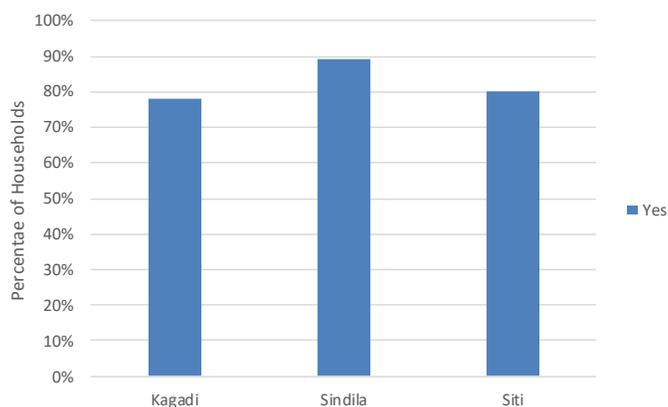


Source: Castalia Household Question 12

In all three sites, households reported that wood was used only for cooking, and candles were used only for lighting. Other sources of energy were reported as mixed use.

Figure K.16 shows the percentage of households reporting that students are in residence.

**Figure K.16: Households Reporting Students in Residence in Households Without Grid-Connections**

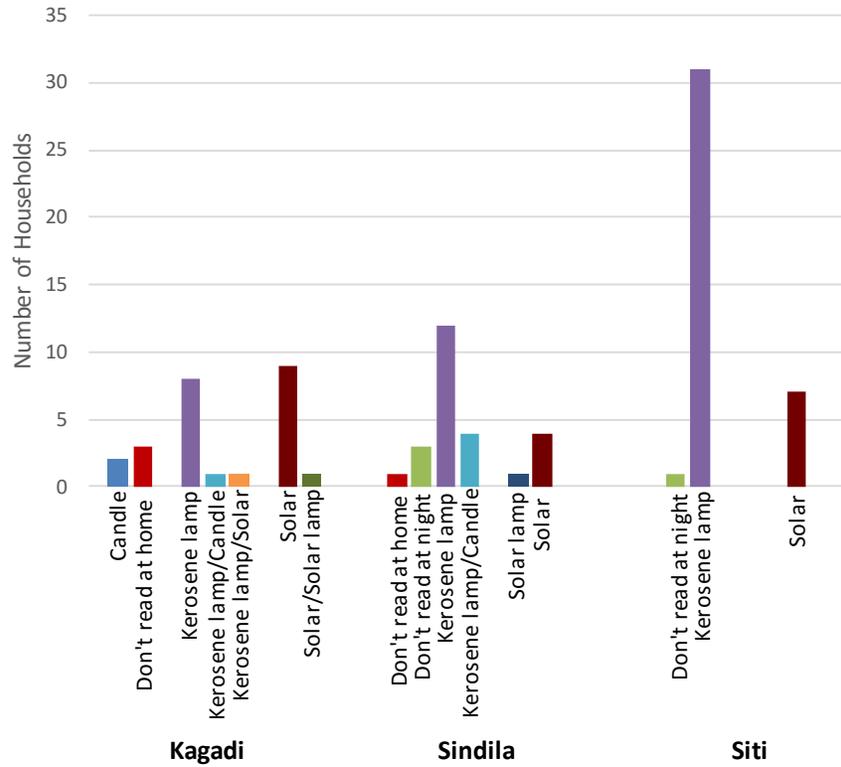


Source: Castalia Household Survey Question 14

In all three sites, 75 percent to 90 percent of households report that they live with students.

Figure K.17 shows the prevalence energy sources other than grid-connected electricity used by students for lighting.

**Figure K.17: Energy Sources Used for Lighting for Studying in Households Without Grid-Connections**



Source: Castalia Housed Survey Question 15

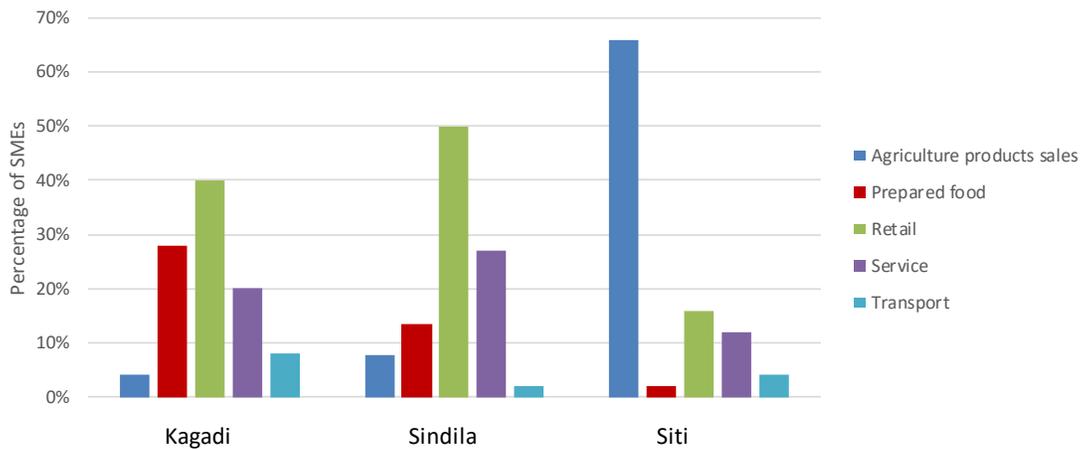
In Kagadi and Sindila, kerosene lamps and solar were the most prevalent energy sources. In Siti, kerosene lamps were reported as by far the most prevalent energy source, followed by solar

## K.2 SME

This section presents findings from the survey of SMEs.

Figure K.18 shows the distribution of types of SMEs in the survey sample.

**Figure K.18: Distribution of SME Types**

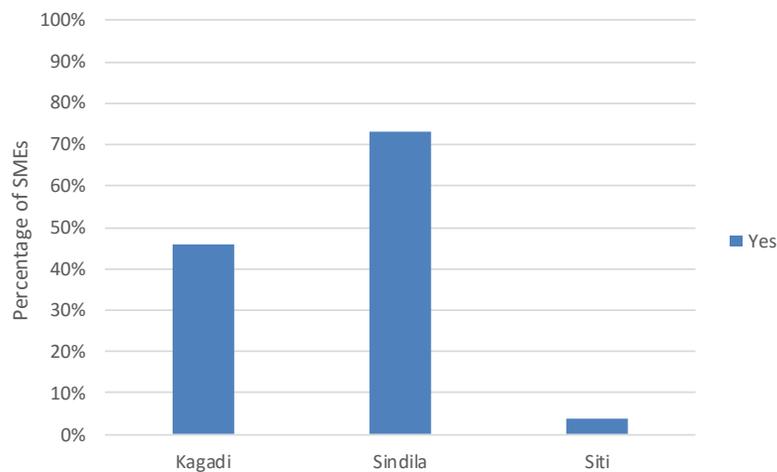


Source: Castalia SME Survey Question 1

In Kagadi and Sindila, SMEs report retail as the most prevalent business type. In Siti, SMEs report agriculture products sales as the most prevalent business type.

Figure K.19 shows the percentage of SMEs reporting access to grid-connected electricity.

**Figure K.19: SMEs with Access to Grid-Connected Electricity**

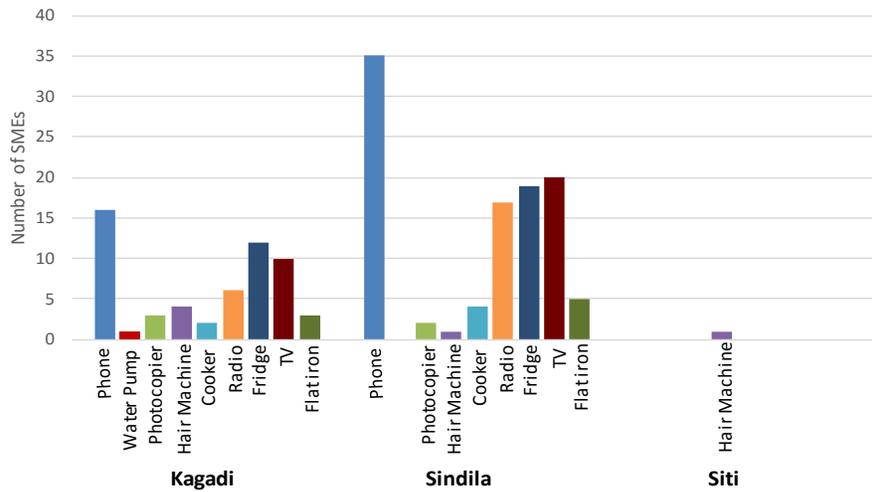


Source: Castalia SME Survey Question 2

In Kagadi and Sindila, 45 percent to 75 percent of SMEs report access to grid-connected electricity. In Siti, nearly 100 percent of SMEs report no access to grid-connected electricity.

Figure K.20 shows the prevalence of appliances that use electricity in businesses with grid connections.

**Figure K.20: SME Reporting Use of Electrical Appliances**

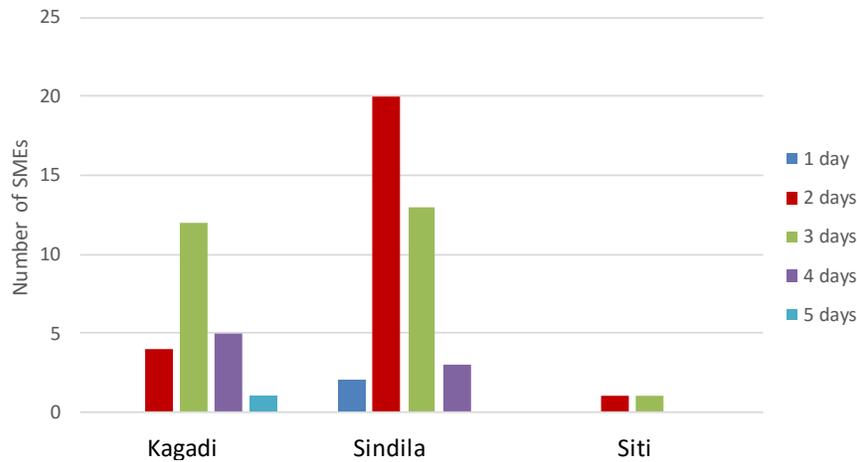


Source: Castalia SME Survey Questions 3 and 4

In Kagadi and Sindila, telephones are the most common electrical appliance, followed by refrigerators and televisions. In Siti, there is very limited access to grid-connected electricity, and thus there is limited use of electrical appliances.

Figure K.21 shows the number of SMEs reporting the number of days per week on which they do not have access to grid-connected electricity.

**Figure K.21: Days per Week Without Grid-Connected Electricity as Reported by SMEs**

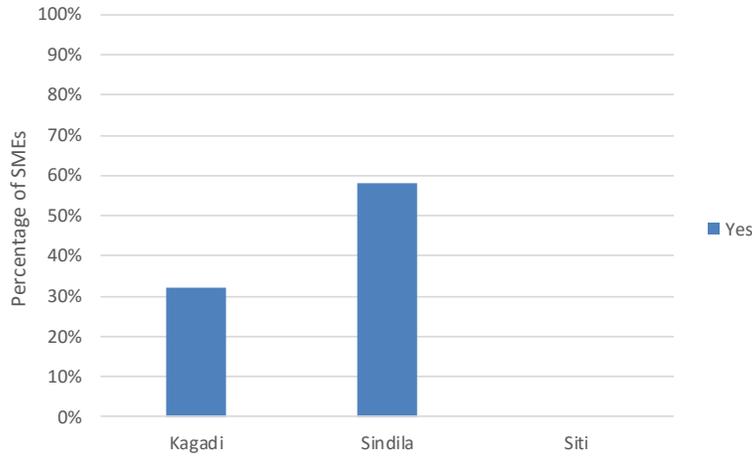


Source: Castalia SME Survey Question 5

In Kagadi and Sindila, a majority of SMEs report 2 or 3 days per week with no access. In Siti, one SME reported that it had access to grid electricity. This will be verified with the Rural Electrification Agency before the next report in this engagement. It is likely that no households near Siti actually had grid electricity.

Figure K.22 shows the percentage of SMEs reporting that electricity from the grid is stable when it is available.

**Figure K.22: Stability of Grid-Connected Electricity as Reported by SMEs**

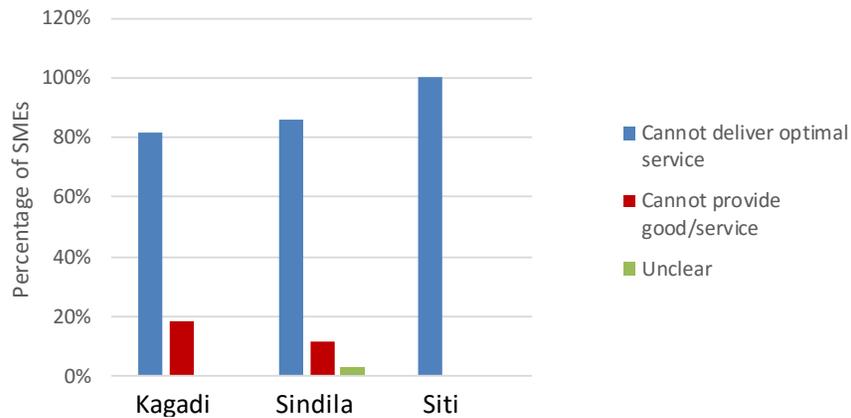


Source: Castalia SME Survey Question 6

In Kagadi and Sindila, 30 percent and 55 percent of SMEs report having stable power when they have access. In Siti, 100 percent of SMEs report that power is not stable.

Figure K.23 shows how unstable power affects SMEs with grid connections.

**Figure K.23: Effects of Unstable Power on SMEs with Grid Connections**

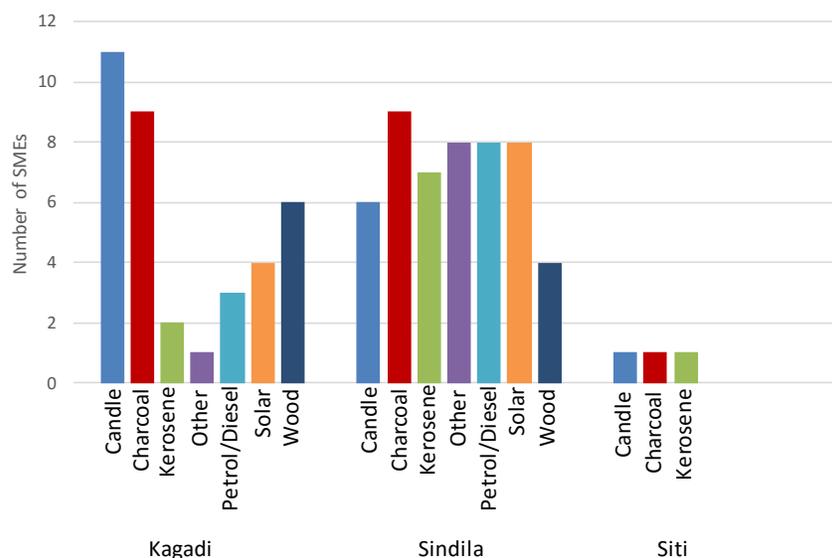


Source: Castalia SME Survey Question 7

In all three sites, 80 percent to 100 percent of SMEs report the most significant effect as being unable to deliver optimal service to customers.

Figure K.24 shows the prevalence of energy sources other than grid-connected electricity.

**Figure K.24: Prevalence of Energy Sources Other Than Grid-Connected Electricity**

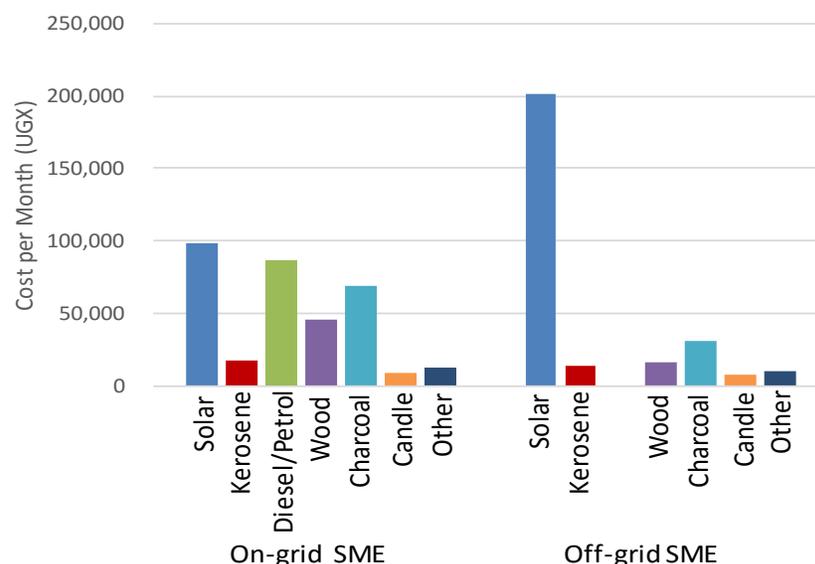


Source: Castalia SME Survey Question 8

In Kagadi and Sindila, charcoal and candles were the most prevalent sources of energy, followed by solar, petrol and diesel, and other. In Siti, only candles, charcoal and kerosene were reported as sources of energy.

Figure K.25 shows the average cost of non-grid-connected electricity sources of energy.

**Figure K.25: On-Grid and Off-Grid SMEs Reporting Expense of Non-Grid-Connected Electricity Sources of Energy**

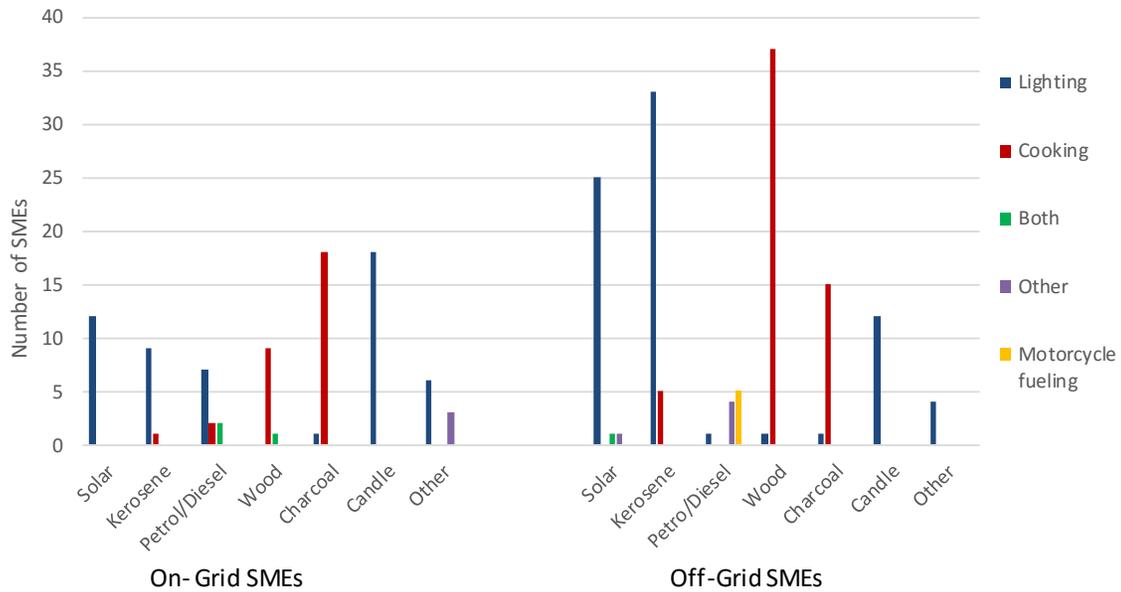


Source: Castalia SME Survey Questions 8 and 14

On-grid and off-grid SMEs in the three sites report that solar is the most expensive source, followed by diesel and petrol, and charcoal.

Figure K.26 shows how energy sources other than grid-connected electricity are used.

**Figure K.26: On-Grid and Off-Grid SMEs Reporting Prevalence of Uses for Energy Sources Other than Grid-Connected Electricity**

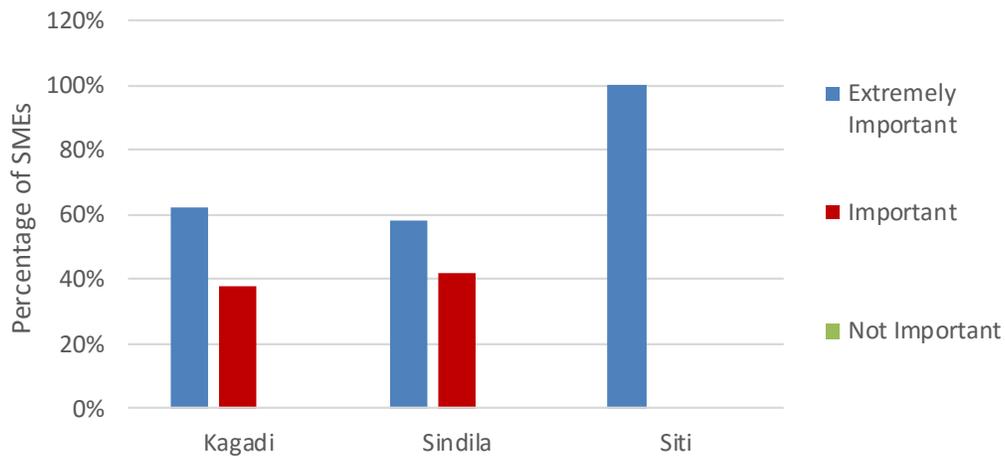


Source: Castalia SME Survey Questions 8 and 14

In the three sites, SMEs report that solar, kerosene and candles are used almost exclusively for lighting, and that charcoal and wood are used almost exclusively for cooking.

Figure K.27 shows how important SMEs though electricity was for their business.

**Figure K.27: SMEs Reporting the Importance of Electricity to Their Business**

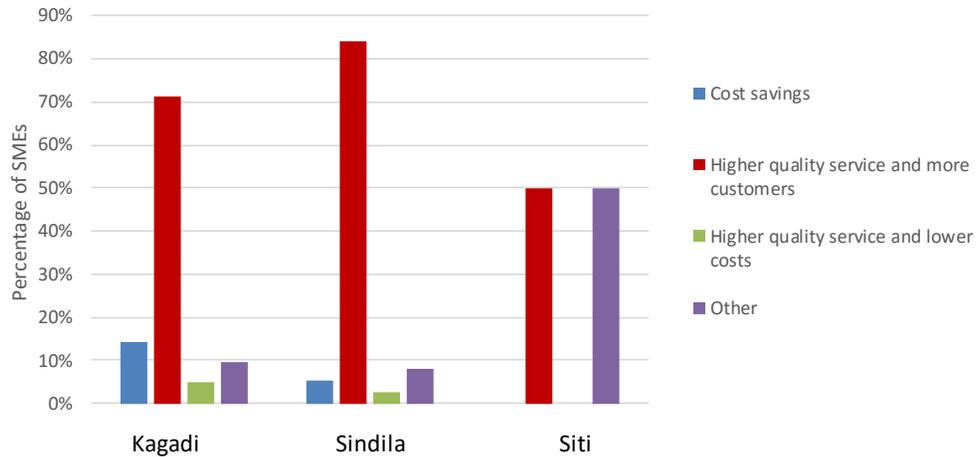


Source: Castalia SME Survey Question 9

In all three sites, 58 percent to 100 percent of SMEs reported grid-connected electricity as extremely important to their business, and the remainder reported grid-connected electricity to be important to their business.

Figure K.28 shows the benefits of stable power for SMEs.

**Figure K.28: SMEs Reporting the Effects of Stable Power on Their Business**

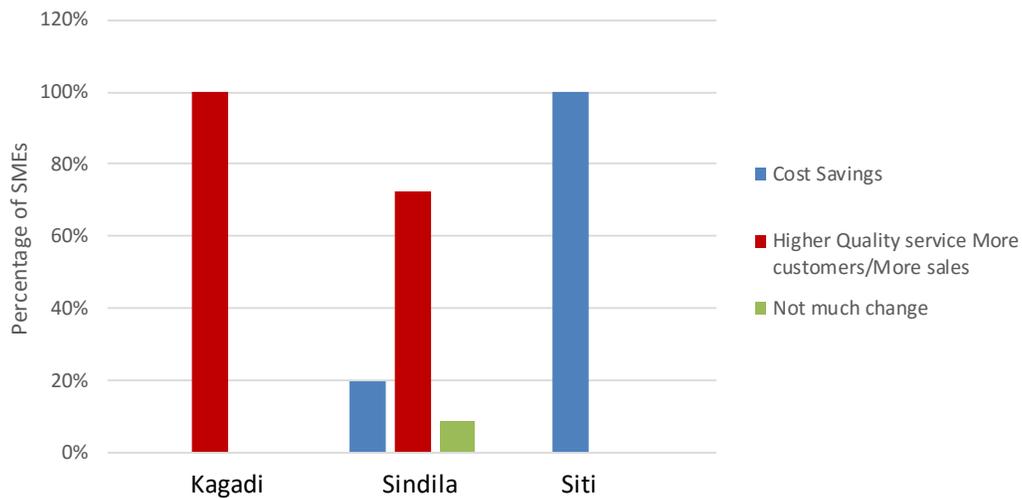


Source: Castalia SME Survey Question 10

In all three sites, the ability to provide higher quality service to attract more customers was the most prevalent reported effect of stable access to grid-connected electricity

Figure K.29 shows how reducing power outages would help SMEs.

**Figure K.29: Expected Benefits of Reducing Power Outages for SMEs**

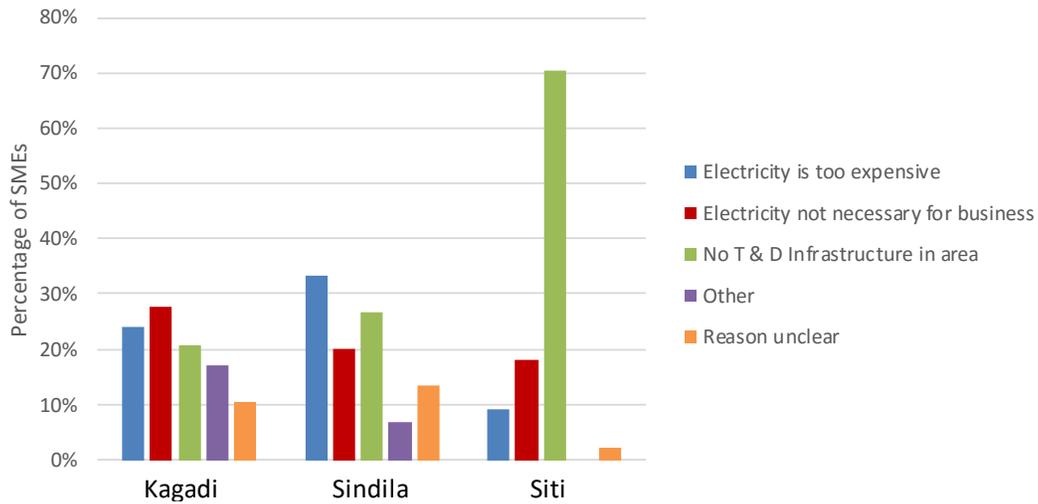


Source: Castalia SME Survey Question 11

In Kagadi and Sindila, the ability to provide higher quality service and attract more customers was reported as the most prevalent effect of fewer power outages. In Siti, respondents were unsure of the effects of fewer power outages.

Figure K.30 shows why SMEs think they lack access to grid-connected electricity.

**Figure K.30: Reasons for Lacking a Grid Connection as Reported by SMEs**

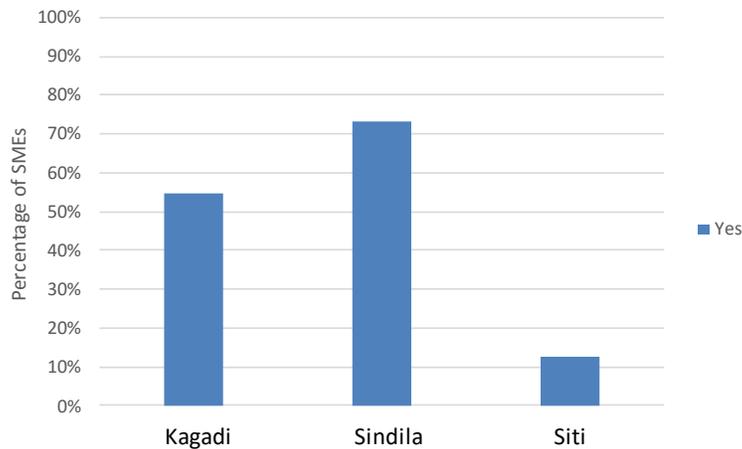


Source: Castalia SME Survey Question 12

In Kagadi and Sindila, the most prevalent reasons for lack of access to electricity were reported as electricity is too expensive, and that electricity is unnecessary for their business. In Siti, by far the most prevalent reason for lack of access to grid-connected electricity was reported as the lack of transmission and distribution infrastructure in their area.

Figure K.31 shows the percentage of SMEs reporting that their neighbors have access to grid-connected electricity.

**Figure K.31: SMEs Reporting Neighbors with Access to Grid-Connected Electricity**

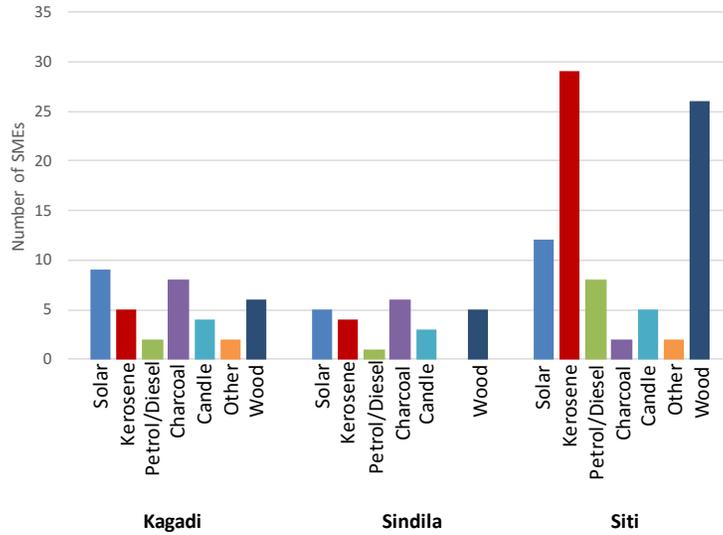


Source: Castalia SME Survey Question 13

In Kagadi and Sindila, 55 percent to 75 percent of SMEs report that their neighbors have access to electricity. In Siti, almost 90 percent of SMEs report that their neighbors do not have access to grid-connected electricity.

Figure K.32 shows the prevalence of energy sources other than grid-connected electricity.

**Figure K.32: Prevalence of Energy Sources Other Than Grid-Connected Electricity as Reported by SMEs**

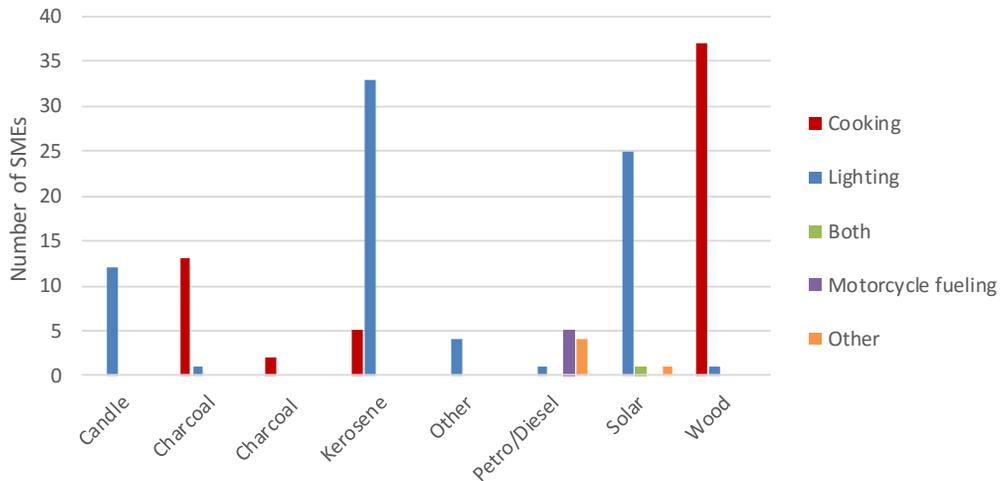


Source: Castalia SME Survey Question 14

In Kagadi and Sindila, solar, charcoal and wood were prevalent. In Siti, kerosene and wood were by the most prevalent sources of energy.

Figure K.33 shows how SMEs use energy sources other than grid-connected electricity.

**Figure K.33: Uses of Energy Sources Other Than Grid-Connected Electricity as Reported by SMEs**



Source: Castalia SME Survey Question 14

Off-grid SMEs in all three sites reported wood and charcoal as an energy source for cooking, and kerosene and candles as energy sources for lighting.

## Appendix L: Questions and Tables

This Appendix shows the findings from the baseline survey of consumers of electricity. Table L.1 contains the responses to each question is shown. The results questions for households are shown first, followed by the questions for SMEs.

### L.1 Households

**Question 1:** Do you use electricity in your home?

**Table L.1: Household Survey Question 1**

Site Name	No	Yes	Grand Total
Kagadi	63%	37%	100%
Sindila	54%	46%	100%
Siti	100%	0%	100%
Grand Total	71%	29%	100%

Source: Castalia Household Survey Question 1

The responses to household survey questions 2 and 3 are consolidated in the table below

**Question 2:** What do you use electricity for?

**Question 3:** What appliances do you have that use electricity?

**Table L.2: Household Survey Questions 2 and 3**

	Bulb	Phone	Radio	TV	Flat Iron	Fridge	Other
Kagadi	20	18	9	6	5		3
Sindila	25	24	3	3	1		
Siti							
Grand Total	45	42	12	9	6		3

Source: Castalia Household Survey Question 2 and 3

**Question 4:** How many days in a typical week do you not have power?

**Table L.3: Household Survey Question 4**

Site Name	1 day	2 days	3 days	4 days	Unpredictable	Grand Total
Kagadi	0%	32%	53%	11%	5%	100%
Sindila	20%	60%	4%	16%	0%	100%

Site Name	1 day	2 days	3 days	4 days	Unpredictable	Grand Total
Siti						0%
Grand Total	11%	48%	25%	14%	2%	100%

Source: Household Survey Question 4

**Question 5:** Is your power stable, when it is on?

**Table L.4: Household Survey Question 5**

Site Name	No	Yes	Grand Total
Kagadi	84%	16%	100%
Sindila	68%	32%	100%
Siti			0%
Grand Total	75%	25%	100%

Source: Castalia Household Survey Question 5

**Question 6a:** What other sources of energy do you use?

**Table L.5: Household Survey Question 6a**

Site Name	Solar	Petrol	Kerosene	Wood	Charcoal	Candle	Others
Kagadi	5		7	7	14	8	4
Sindila	6		11	10	19	10	5
Siti							
Grand Total	11		18	17	33	18	9

Source: Castalia Household Survey Question 6

**Question 6b:** How much money do you spend on each source?

**Table L.6: Household Survey Question 6b**

Site Name	Others	Candle	Charcoal	Wood	Solar	Kerosene	Petrol/Diesel
Average of Sites	5500	10425	35286	15714	87600	5357	

Source: Castalia Household Survey Question 6

**Question 6c:** How much time do you spend in a typical week gathering each source?

**Table L.7: Household Survey Question 6**

Site Name	Solar	Kerosene	Wood	Charcoal	Candle	Others
Average of Sites (Hours)		0.51	2.47	2.35	0.31	1.02

Source: Castalia Household Survey Question 6

**Question 6d:** What do you use each source for?**Table L.8: Household Survey Question 6d**

Source	Cooking	Lighting	Both	Other	Grand Total
Candle		26			26
Charcoal	31				31
Kerosene	1	13	5		19
Other	1	6		1	8
Solar		11			11
Wood	17				17
Grand Total	50	56	5	1	112

Source: Castalia Household Survey Question 6

**Question 7:** Do you live with students?**Table L.9: Household Survey Question 7**

Site Name	No	Yes	Grand Total
Kagadi	32%	68%	100%
Sindila	32%	68%	100%
Siti			
Grand Total	32%	68%	100%

Source: Castalia Household Survey Question 7

**Question 8:** What energy source do the students use to study?

**Table L.10: Household Survey Question 8**

Site Name	Candle	Do not read at home	Do not read at night	Electricity	Electricity and non-electric lighting source	Electricity and rechargeable battery	Electricity and solar	Grand Total
Kagadi	1		1	2	6		3	13
Sindila	1	1	2	1	5	2	5	17
Siti								
Grand Total	2	1	3	3	11	2	8	30

Source: Castalia Household Survey Question 8

**Question 9:** How many hours do they spend on schoolwork at home?

**Table L.11: Household Survey Question 9**

Site Name	1 hour	2 hours	3 hours	4 hours	Grand Total
Kagadi	20%	10%	60%	10%	100%
Sindila	7%	53%	20%	20%	100%
Siti					
Grand Total	12%	36%	36%	16%	100%

Source: Castalia Household Survey Question 9

Household survey questions 10 through 14 are for households without access to grid-connected electricity.

**Question 10:** If no [power], why?

**Table L.12: Household Survey Question 10**

Site Name	Electricity is too expensive	No connection	No T&D Infrastructure	Electricity is too dangerous	Grand Total
Kagadi	13%	31%	53%	3%	100%
Sindila	59%	10%	31%	0%	100%
Siti	4%	92%	4%	0%	100%
Grand Total	21%	52%	26%	1%	100%

Source: Castalia Household Survey Question 10

**Question 11:** Do your neighbors have power?

**Table L.13: Household Survey Question 11**

Site Name	No	Yes	Grand Total
Kagadi	75%	25%	100%
Sindila	48%	52%	100%
Siti	98%	2%	100%
Grand Total	78%	22%	100%

Source: Castalia Household Survey Question 11

**Question 12a:** What other sources of energy do you use?

**Table L.14: Household Survey Question 12**

Site Name	Solar	Kerosene	Petrol/Diesel	Wood	Charcoa 1	Candle	Others
Kagadi	16	12		21	17	10	5
Sindila	5	23		26	16	6	3
Siti	11	44	1	49	2		
Grand Total	32	79	1	96	35	16	8

Source: Castalia Household Survey Question 12

**Question 12b:** How much money do you spend in a typical month on each source?**Table L.15: Household Survey Question 12**

Site Name	Solar	Kerosene	Petrol/Diesel	Wood	Charcoal	Candle
Average of Sites	90,615	31,278	9,000	12,856	28,914	5,360

Source: Castalia Household Survey Question 12

**Question 12c:** How much time do you spend in a typical week gathering each source?**Table L.16: Household Survey Question 12**

Site Name	Others	Candle	Solar	Kerosene	Charcoal	Wood	Petrol/diesel
Average of Sites			1.5	1.3		2.7	

Source: Castalia Household Survey Question 12

**Question 12d:** What do you use each source for?**Table L.17: Household Survey Question 12**

Row Labels	Lighting	Cooking	Both	Other	Grand Total
Candle	16				16
Charcoal		28	3	1	32
Kerosene	71	2	6		79
Other	6			2	8
Petrol/Diesel	1				1
Solar	24		1	1	26
Wood		93			93
<b>Grand Total</b>	<b>118</b>	<b>123</b>	<b>10</b>	<b>4</b>	<b>255</b>

Source: Castalia Household Survey Question 12

**Question 14:** Do you live with students?

**Table L.18: Household Survey Question 14**

Row Labels	No	Yes	Grand Total
Kagadi	22%	78%	100%
Sindila	11%	89%	100%
Siti	20%	80%	100%
<b>Grand Total</b>	<b>18%</b>	<b>82%</b>	<b>100%</b>

Source: Castalia Household Survey Question 14

**Questions 15 and 16 are for households with students, but without access to grid-connected electricity.**

**Question 15:** What energy source do the students use to study?

**Table L.19: Household Survey Question 15**

Row Labels	Candle	Don't read at home	Don't read at night	Kerosene lamp	Kerosene lamp and candle	Kerosene lamp and solar	Rechargeable lamp	Solar	Solar and rechargeable lamp	Grand Total
Kagadi	2	3		8	1	1		9	1	25
Sindila		1	3	12	4		1	4		25
Siti			1	31				7		39
<b>Grand Total</b>	<b>2</b>	<b>4</b>	<b>4</b>	<b>51</b>	<b>5</b>	<b>1</b>	<b>1</b>	<b>20</b>	<b>1</b>	<b>89</b>

Source: Castalia Household Survey Question 15

**Question 16:** How many hours do they spend on schoolwork at home?

**Table L.20: Household Survey Question 16**

Row Labels	30 mins	1 hour	2 hours	3 hours	4 hours	5 hours	7 hours	Grand Total
Kagadi	5%	24%	48%	14%	5%	5%	0%	100%
Sindila	5%	11%	37%	26%	16%	0%	5%	100%
Siti	0%	16%	47%	34%	3%	0%	0%	100%
<b>Grand Total</b>	<b>3%</b>	<b>17%</b>	<b>45%</b>	<b>27%</b>	<b>6%</b>	<b>1%</b>	<b>1%</b>	<b>100%</b>

Source: Castalia Household Survey Question 16

## L.2 SMEs

**Question 1:** What kind of business do you have?

**Table L.21: SME Survey Question 1**

Row Labels	Agriculture products sales	Prepared food	Retail	Service	Transport	Grand Total
Kagadi	4%	28%	40%	20%	8%	100%
Sindila	8%	13%	50%	27%	2%	100%
Siti	66%	2%	16%	12%	4%	100%
<b>Grand Total</b>	<b>26%</b>	<b>14%</b>	<b>36%</b>	<b>20%</b>	<b>5%</b>	<b>100%</b>

Source: Castalia SME Survey Question 1

**Question 2:** Do you have electricity in your business?

**Table L.22: SME Survey Question 2**

Site Name	No	Yes	Grand Total
Kagadi	54%	46%	100%
Sindila	27%	73%	100%
Siti	96%	4%	100%
Grand Total	58%	42%	100%

Source: Castalia SME Survey Question 2

**SME survey questions 3 through 11 are for SMEs with access to grid-connected electricity.**

**Question 3:** What do you use electricity for?

**Table L.23: SME Survey Question 3**

Site Name	Phone	Water Pump	Photocopier	Hair Machine	Cooker	Radio	Fridge	TV	Flat Iron
Kagadi	16	1	3	4	2	6	12	10	3
Sindila	35		2	1	4	17	19	20	5
Siti				1					
Grand Total	51	1	5	6	6	23	31	30	8

Source: Castalia SME Survey Question 3

**Question 4:** What electrical appliances do you use for your business?

**Table L.24: SME Survey Question 4**

Site Name	Phone	Water Pump	Photocopier	Hair Machine	Cooker	Radio	Fridge	TV	Flat Iron
Kagadi	16	1	3	4	2	6	12	10	3
Sindila	35		2	1	4	17	19	20	5
Siti				1					
Grand Total	51	1	5	6	6	23	31	30	8

Source: Castalia SME Survey Question 4

**Question 5:** How many days in a typical week do you not have power?

**Table L.25: SME Survey Question 5**

Site Name	1 day	2 days	3 days	4 days	5 days	Grand Total
Kagadi		4	12	5	1	22
Sindila	2	20	13	3		38
Siti		1	1			2
Grand Total	2	25	26	8	1	62

Source: Castalia SME Survey Question 5

**Question 6:** Is your power stable, when it is on?

**Table L.26: SME Survey Question 6**

Site Name	No	Yes	Grand Total
Kagadi	68%	32%	100%
Sindila	42%	58%	100%
Siti	100%	0%	100%
Grand Total	53%	47%	100%

Source: Castalia SME Survey Question 6

**Question 7:** What you miss most when you do not have electricity?

**Table L.27: SME Survey Question 7**

Site Name	Cannot deliver optimal service	Cannot provide good/service	Unclear	Grand Total
Kagadi	82%	18%	0%	100%
Sindila	86%	11%	3%	100%
Siti	100%	0%	0%	100%
Grand Total	85%	13%	2%	100%

Source: Castalia SME Survey Question 7

**Question 8a:** What other sources of energy do you use?

**Table L.28: SME Survey Question 8**

Site Name	Candle	Charcoal	Kerosene	Other	Petrol/Diesel	Solar	Wood	Grand Total
Kagadi	11	9	2	1	3	4	6	36
Sindila	6	9	7	8	8	8	4	50

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Site Name	Candle	Charcoal	Kerosene	Other	Petrol/Diesel	Solar	Wood	Grand Total
Siti	1	1	1					3
Grand Total	18	19	10	9	11	12	10	89

Source: Castalia SME Survey Question 8

**Question 8b:** How much money do you spend in a typical month on each source?

**Table L.29: SME Survey Question 8**

Site Name	Solar	Kerosene	Diesel/Petrol	Wood	Charcoal	Candle	Other
Average of Sites	97,857	16,667	85,882	45,286	68,864	8,106	11,833

Source: Castalia SME Survey Question 8

**Question 8c:** How much time do you spend in a typical week gathering each source?

No table containing answers to SME survey Question 8c is presented because there was no response data available.

**Question 8d:** What do you use each source for?

**Table L.30: SME Survey Question 8**

Energy Source	Lighting	Cooking	Both	Other	Grand Total
Solar	12				12
Kerosene	9	1			10
Petrol/Diesel	7	2	2		11
Wood		9	1		10
Charcoal	1	18			19
Candle	18				18
Other	6			3	9
Grand Total	53	30	3	3	89

Source: Castalia SME Survey Question 8

**Question 9:** How important would you say having electricity is to your business?

**Table L.31: SME Survey Question 9**

Site Name	Extremely Important	Important	Not Important
Kagadi	62%	38%	0%
Sindila	58%	42%	0%
Siti	100%	0%	0%

Source: Castalia SME Survey Question 9

**Question 10:** How would having more stable power affect your business in the future?**Table L.32: SME Survey Question 10**

Site Name	Cost savings	Higher quality service and more customers	Higher quality service and lower costs	Other	Grand Total
Kagadi	14%	71%	5%	10%	100%
Sindila	5%	84%	3%	8%	100%
Siti	0%	50%	0%	50%	100%
Grand Total	8%	79%	3%	10%	100%

Source: Castalia SME Survey Question 10

**Question 11:** How would having fewer outages effect your business in the future?**Table L.33: SME Survey Question 11**

Site Name	Cost Savings	Higher Quality Service More customers/More sales	Not much change	Grand Total
Kagadi	0%	100%	0%	100%
Sindila	19%	72%	8%	100%
Siti	100%	0%	0%	100%
Grand Total	15%	80%	6%	100%

Source: Castalia SME Survey Question 11

SME survey questions 12 through 14 are for SMEs without access to grid-connected electricity.

**Question 12:** Why do you not have power?

**Table L.34: SME Survey Question 12**

Row Labels	Electricity is too expensive	Electricity not necessary for business	No T & D Infrastructure in area	Other	Reason unclear	Grand Total
Kagadi	24%	28%	21%	17%	10%	100%
Sindila	33%	20%	27%	7%	13%	100%
Siti	9%	18%	70%	0%	2%	100%
Grand Total	18%	22%	47%	7%	7%	100%

Source: Castalia SME Survey Question 12

**Question 13:** Do your neighbors have power?**Table L.35: SME Survey Question 13**

Site Name	No	Yes	Grand Total
Kagadi	45%	55%	100%
Sindila	27%	73%	100%
Siti	88%	13%	100%
Grand Total	66%	34%	100%

Source: Castalia SME Survey Question 13

**Question 14a:** What other sources of energy do you use?**Table L.36: SME Survey Question 14**

Site Name	Solar	Kerosene	Petrol/Diesel	Charcoal	Candle	Other	Wood
Kagadi	9	5	2	8	4	2	6
Sindila	5	4	1	6	3		5
Siti	12	29	8	2	5	2	26
Grand Total	26	38	11	16	12	4	37

Source: Castalia SME Survey Question 14

**Question 14b:** How much money do you spend in a typical month on each source?**Table L.37: SME Survey Question 14**

Site Name	Solar	Kerosene	Wood	Charcoal	Candle	Other
Average of Sites	202,095	13,528	15,886	30,938	7,333	9,333

Source: Castalia SME Survey Question 14

**Question 14c:** How much time do you spend in a typical week gathering each source?

No table containing answers to SME survey question 8c is presented because there was no response data available.

**Question 14d:** What do you use each source for?

**Table L.38: SME Survey Question 14**

Energy Source	Cooking	Lighting	Both	Motorcycle fueling	Other	Grand Total
Candle		12				12
Charcoal	13	1				14
Charcoal	2					2
Kerosene	5	33				38
Other		4				4
Petrol/Diesel		1		5	4	10
Solar		25	1		1	27
Wood	37	1				38
Grand Total	57	77	1	5	5	145

Source: Castalia SME Survey Question 14

## **Appendix M: Interview Template for Developers and Investors in GET FiT projects**

- Interviewee:
- Interviewer:
- Date:

### **M.1 Categorization**

- What kind of finance do you provide? Equity or debt?
- How much money of have you invested in GET FiT? For which power plants?
- What is your organization's nationality?
- What is the total value of your firm's investments, with support from GET FiT and elsewhere?
- What experience do you have investing Uganda?
- What experience you have investing in RE?

### **M.2 General**

- How did you become interested in investing in RE in Uganda?
- What is the added value of GET FiT as compared to investing without in RE in Uganda without GET FiT?
- Which projects have you been involved with previously?
- Who made the decision to [develop/invest in] the projects you are currently involved with?
- What made you decide to [develop/invest in] the projects you are currently involved with?
- How as the decision to pursue this project made?
- Would you have invested if GET FiT did not exist?
- How is your project progressing against its schedule? What has caused delays, if any?

### **M.3 GET FiT Premium Payment**

- Is your project receiving a top-up payment from GET FiT?
- What do you think of the premium, or top-up payment, provided by GET FiT?
- Did this payment impact your investment decision in any way and how?
- Did the payment reduce any risks in any way and how?
- How would your project have been impacted if the payment was not offered?
- Would your project have been financially viable without the payment?

#### **M.4 Standardized PPA and other documents**

- What do you think of the standardized PPA and other legal documents offered under GET FiT?
- Did the standardized documents impact your investment decision in any way?
- Did the standardized documents have any impact on the risks associated with the project? In what way?
- Did you view legal risk as significant?
- Did the standardized documents have any impact on costs associated with your project? In what way?
- How would your project have been impacted if the standardized documents were not offered?

#### **M.5 Capacity building for ERA**

- What experience do you have working with the Electricity Regulatory Authority (ERA)?
- What is your view of ERA's capacity? Have you seen any changes in its capacity? What changes have you seen?
- What regulatory risks, if any, are you concerned about?
- What, if anything, has ERA done that reduced your perception of risk?
- What, if anything, has ERA done that increased your perception of risk?
- Are you aware of support that GET FiT provided to ERA?
  - [If yes] In your opinion, did any of these things help?
    - Capacity building for tariff regulation
    - Capacity building for due diligence
    - Capacity building for interconnection oversight
  - If these things had not been done, how would your project have been affected?

#### **M.6 Partial Risk Guarantees (PRGs)**

- Were you aware of the World Bank's Partial Risk Guarantees (PRGs) offered under GET FiT?
- Were you eligible for the PRGs?
- Did you consider using the PRGs offered under GET FiT?
  - Why? / Why not?
- Why did you not use the PRGs? Please explain
- Did you use any other risk mitigation instruments? If so, which ones and what risks did they cover?
- Did the PRG offering impact your investment decision in any way?

- Did the PRG cover the risks you were most concerned about?
- Could the PRGs have reduced your project's risks in any way?
- Was the PRG adequate to mitigate those risks?
- Would you have used a PRG if it cost less?
- How could the PRG have been adapted to make it a more attractive offering?

### **M.7 Interconnection Component**

- Do you anticipate any programs evacuating power from your power plants?
- Were you aware of any potential interconnection problems for your project?
- When and how did you become aware of those interconnection problems?
- Are you aware of [list specific infrastructure works receiving support from GET FiT]?
- Were you aware that these works are supported by GET FiT?
- Did the proposed interconnection infrastructure impact your investment decision in any way? If so, to what extent did it impact your decision?
- Did the support for interconnection infrastructure reduce any risks in any way?
- Did you view deemed power risk as significant?
- Did the support for infrastructure reduce your project's costs in any way?
- How would your project have been impacted if the support for interconnection infrastructure was not provided?
- What do you think of the interconnection infrastructure being supported by GET FiT?

### **M.8 Environmental and Social Compliance, and Conditions Precedent**

- What did you think of the environmental and social standards for GET FiT projects?
- Do you think they could have been improved? How so?
- What challenges, if any, did your project face with environmental and social compliance?
- What conditions precedent (CPs) did your project have? What did you think of them?
- Would technical assistance for you or your consultants have helped you meet environmental and social standards? How so?

### **M.9 Closing**

- Do you have any advice on doing more to promote RE?
- Do you have any advice for donors on supporting RE in Uganda?

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- Would you be interested in [developing/invest in] projects that have support from programs like GET FiT in other countries? Why?
- Do you have any other comments?

## **Appendix N: Interview Template for Developers and Investors that Applied for GET FiT, and Were Not Selected**

- Interviewee:
- Interviewer:
- Date:

### **N.1 Categorization**

- How much money were you planning on investing with GET FiT support? For which power plants?
- What is your organization's nationality?
- What is the total value of your firm's investments?
- What experience do you have investing Uganda?
- What experience you have investing in RE?

### **N.2 General**

- How did you become interested in investing in RE in Uganda?
- What is the added value of GET FiT as compared to investing without in RE in Uganda without GET FiT?
- Which projects have you been involved with previously?
- What made you decide to develop the projects you are currently involved with?
- What made you decide to apply to GET FiT?
- Is the project you submitted to GET FiT still going ahead?
- How has not being selected by GET FiT impacted your project?
- Is your project still financially viable without the premium payment from GET FiT? Please explain.

### **N.3 Selection Process**

- What did you think of the selection process?
- What reasons did GET FiT give for your project not being selected?
- Why do you believe your project was not selected?
- Were there any parts of the selection process that worked well?
- Were there any parts of the selection process that could have been improved?
- What did you think of the evaluation criteria used by GET FiT?
- Were the environmental and social standards a particular challenge for your project? How so?

- Do you think technical assistance for you or your consultants could have helped your project meet the environmental and social standards? How so?

#### **N.4 Closing**

- Could the selection process have been changed to make it easier for your project to be successful? How so?
- Would you consider applying for support from GET FiT in other countries? Why?
- Do you have any other comments?

## **Appendix O: Interview Template for Developers and Investors that Did Not Apply for GET FiT, but Would Be Expected to**

- Interviewee:
- Interviewer:
- Date:

### **O.1 Categorization**

- What kind of finance do you provide? Equity or debt?
- How much money of have you invested in RE in East Africa?
- What is your organization's nationality?
- What is the total value of your firm's investments?
- What experience do you have investing Uganda?
- What experience you have investing in RE?
- What experience do you have with donor or government programs that aim to encourage investment in RE in East Africa?
- What experience do you have with donor or government programs that aim to encourage investment in RE in Uganda?

### **O.2 General**

- Is Uganda an attractive market for investing in renewable energy? Why?
- Are you aware of the GET FiT Uganda program? If so, what does it do?
- Have you considered investing in a project that would apply for support from GET FiT? Why?
- Does GET FiT provide any help that could have been useful for you? Please explain.
- Would you have considered applying to GET FiT if its offerings were different? Please explain.

### **O.3 GET FiT Premium Payment**

- What is your experience with subsidies for renewable energy?
- What is your experience with feed-in tariffs?
- Are you aware of the premium payment offered by GET FiT?
- What do you think of the premium, or top-up payment, provided by GET FiT?
- If the premium payment were different, would you have considered applying for GET FiT? How so?

#### **O.4 Standardized PPA and other documents**

- What is your experience with power purchase agreements?
- Are you aware of the standard PPA and other documents provided by GET FiT?
- What do you think of standard PPA and other documents provided by GET FiT?
- If the standard PPA and other documents were different, would you have considered applying for GET FiT? How so?

#### **O.5 Capacity building for ERA**

- What is your experience with ERA, the electricity regulator in Uganda?
- Are you aware of capacity building that GET FiT provided for ERA?
- What do you think of that capacity building?
- If that capacity building was different, would you have considered applying for GET FiT? How so?

#### **O.6 Partial Risk Guarantees (PRGs)**

- What is your experience with partial risk guarantees or other risk mitigation instruments?
- Are you aware of the partial risk guarantee offered by GET FiT?
- What do you think of the partial risk guarantee offered by GET FiT?
- If the partial risk guarantee were different, would you have considered applying for GET FiT? How so?

#### **O.7 Interconnection Component**

- What is your experience with grid interconnection issues?
- Are you aware of interconnection works that were supported by GET FiT?
- What did you think of those interconnection works?
- If the interconnection works were different, would you have considered applying for GET FiT? How so?

#### **O.8 Closing**

- Do you have any advice on how GET FiT Uganda could be improved?
- Do you have any advice for donors on supporting RE in Uganda?
- Would you be interested in projects that have support from programs like GET FiT in other countries? Why?
- Do you have any other comments?

## Appendix P: Questionnaires for Consumer Surveys

The questionnaires for consumer surveys as administered are presented below. This appendix contains questionnaires for surveying the following consumers of electricity:

- Households
- SMEs
- Schools
- Medical Facilities.

### P.1 Households

#### P.1.1 Demographic Information–Household

To be answered by enumerator:	
1. LC	
2. District	
3. Sub-County	
4. What distribution company serves the area	
5. What substations serve the area [Castalia to complete]	
6. Location (where talking)	
To be answered by respondent:	
7. Customer name	
8. Gender	
9. Number of people in household	
P.1.2 Household Questions	
1. Do you use electricity in your home?	
If “yes” to Question 1, go to Question 2. If “no” to Question 1, skip to Question 10	
2. What do you use electricity for?	
3. What appliances do you have that use electricity?	

4. How many days in a typical week do you not have power?						
5. Is your power stable, when it is on?						
6. What other sources of energy do you use? How much money do you spend in a typical month on each source? How much time do you spent in a typical week gathering each source? What do you use each source for?	<b>Source</b>	<b>Y/N</b>	<b>Cost/ month</b>	<b>Time/ Week</b>	<b>Cooking</b>	<b>Lighting</b>
	Solar					
	Kerosene					
	Petrol/diesel					
	Wood					
	Charcoal					
Other						
7. Do you live with students?						

**If response to Question 7 is “yes”, go to Question 8. If response to Question 7 is “no”, skip to Question 17.**

8. What energy source do the students use to study?						
9. How many hours do they spend on schoolwork at home?						

**After Question 10, skip to Question 17 for households that do have power.**

**Continue below if response to Question 1 is “no”. That is to say, if households do not have power.**

10. If no, why?						
11. Do your neighbors have power?						
12. What other sources of energy do you use? How much money do you spend in a typical month on each source? How much time do you	<b>Source</b>	<b>Y/N</b>	<b>Cost/ Month</b>	<b>Time/ week</b>	<b>Cook</b>	<b>Light</b>
	Solar					
	Kerosene					
	Petrol/diesel					

spent in a typical week gathering each source? What do you use each source for?	Wood					
	Charcoal					
	Other					
13. Which members of the household gather fuel?						
14. Do you live with students?						
<b>If response to Question 14 is “yes”, go to Question 15. If response to Question 14 is “no”, skip to Question 17.</b>						
15. What energy source do the students use to study?						
16. How many hours do they spend on schoolwork at home?						
<b>Finish all surveys of households with Question 17</b>						
17. Do you have any other comments?						

**P.2 SMEs**

**P.2.1 Demographic Information -SME**

<b>To be answered by enumerator:</b>	
1. LC	
2. District	
3. Sub-County	
4. What distribution company serves the area	
5. What substations serve the area [Castalia to complete]	
6. Location (where talking)	
<b>To be answered by respondent:</b>	
7. Customer name	
8. Gender	

9. Number of people in household	
10. How much do you sell in a typical month (money)?	

**P.2.2 SME Questions**

1. What kind of business do you have?	
2. Do you have electricity in your business?	

**If "yes" to Question 2, go to Question 3. If "no" to Question 2, skip to Question 13**

3. What do you use electricity for?	
4. What electrical appliances do you use for your business?	
5. How many days in a typical week do you not have power?	
6. Is your power stable, when it is on?	
7. What do you miss when you do not have electricity?	

8. What other sources of energy do you use? How much money do you spend in a typical month on each source? How much time do you spend in a typical week gathering each source? What do you use each source for?	<b>Source</b>	<b>Y/N</b>	<b>Cost/ month</b>	<b>Time/ Week</b>	<b>Cook</b>	<b>Light</b>
	Solar					
	Kerosene					
	Petrol/diesel					
	Wood					
	Charcoal					
	Other					

9. How important would you say having electricity is to your business?	<p>a. Extremely important. My business cannot operate without electricity.</p> <p>b. Important. Electricity helps me work more efficiently or make more money.</p> <p>c. Not important. Having electricity does not increase my revenue, and does not contribute much to my efficiency.</p>
10. How would having more stable power affect your business in the future?	
11. How would having fewer outages effect your business in the future?	

**Skip to Question 15**

**Continue below if response to Question 1 is “no”**

12. Why do you not have power?						
13. Do your neighbors have power?						
14. What other sources of energy do you use? How much money do you spend in a typical month on each source? How much time do you spend in a typical week gathering each source? What do you use each source for?	<b>Source</b>	<b>Y/N</b>	<b>Cost/ month</b>	<b>Time/ Week</b>	<b>Cook</b>	<b>Light</b>
	Solar					
	Kerosene					
	Petrol/diesel					
	Wood					
	Charcoal					
	Other					

**Finish with Question 15 for all SMEs**

15. Do you have any other comments?	
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### **P.3 Schools**

#### **P.3.1 Demographic Information-School**

**To be answered by enumerator:**

1. LC	
2. District	

3. Sub-County	
4. What distribution company serves the area	
5. What substations serve the area [Castalia to complete]	
6. Location (where talking)	

**To be answered by respondent:**

7. Customer name	
8. Gender	

**P.3.2 School Questions**

1. Is this a nursery, primary, or secondary school?	
2. Do you have electricity in your school?	

**If response to Question 2 is “no”, move to Question 13**

3. If yes, how many hours in a typical day do you not have power?	
4. How many days in a typical week do you not have power?	
5. Is your power stable, when it is on?	
6. What else do you use electricity for?	
7. What electrical appliances do you use for work?	
8. What do you miss when you do not have electricity?	
9. What other energy sources do you use at your school?	
10. How important would you say having electricity is to your school?	<p>a. Extremely important. My school cannot operate without electricity.</p> <p>b. Important. Electricity helps the school do a better job of teaching.</p> <p>c. Not important. Having electricity does not help the school do a better job of teaching.</p>
11. How would more stable power affect your school in the future?	

12. How would having fewer outages affect your school in the future?

**Skip to Question 17 for schools that do have power**

**Continue below if response to Question 2 is “no”**

13. How does not having power affect your school?

14. Why do you not have power?

15. Do your neighbors have power?

16. What other energy sources do you use? How much do you spend monthly on each source?

**Finish with Question 17 for all schools**

17. Do you have any other comments?

## P.4 Medical Facilities

### P.4.1 Demographic Information-Medical Facility

**To be answered by enumerator:**

1. LC

2. District

3. Sub-County

4. What distribution company serves the area

5. What substations serve the area  
[Castalia to complete]

6. Location (where talking)

**To be answered by respondent:**

7. Customer name

8. Gender

9. Number of people in household

### P.4.2 Medical Facility Questions

1. What kind of medical center is this?

2. Do you have electricity in your medical center?

**If response to Question 2 is “no”, move to Question 13**

3. What do you use electricity for?

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4. What electrical appliances do you use for work?	
5. If yes, how many hours in a typical day do you not have power?	
6. How many days in a typical week do you not have power?	
7. Is your power stable, when it is on?	
8. What do you miss when you do not have electricity?	
9. What other energy sources do you use at your medical center?	
10. How important would you say having electricity is to your medical center?	<p>a. Extremely important. My medical center cannot operate without electricity.</p> <p>b. Important. Electricity helps the medical center deliver better health services.</p> <p>c. Not important. Having electricity does not help the medical center deliver better services.</p>
11. How would more stable power affect your medical center in the future?	
12. How would having fewer outages affect your medical center in the future?	
<b>Skip to 17 for medical facilities that do have power</b>	
<b>Continue below if response to Question 2 is “no”</b>	
13. How does not having power affect your school?	
14. Why do you not have power?	
15. Do your neighbors have power?	
16. What other energy sources do you use? How much do you spend monthly on each source?	
<b>Finish with Question 17 for all medical facilities</b>	
17. Do you have any other comments?	



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