GET FiT UGANDA

ANNUAL REPORT 2018

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MESSAGE FROM MEMD

The Ministry of Energy and Mineral Development (MEMD) is a proud partner of the GET FiT Uganda Programme and is happy to see that the Programme is setting an example for successful public private partnerships in Uganda. The Programme's portfolio of 17 small renewable energy projects distributed across the country contributes to national grid stability and promotion of the Government's universal access agenda.

In 2018, the Programme has continued to achieve important milestones through the commissioning of four more hydropower projects. GET FiT Uganda now has 10 out of 17 projects commissioned, and the operational projects contributed over 250 GWh of energy to the national grid in the last year. While the full evacuation of some projects remains an issue that must be further resolved, the Programme has demonstrated good value for the Ugandan power sector.

The MEMD looks forward to a continued cooperation with GET FiT and its development partners in the coming years – and is proud to be a pioneer in demonstrating the successful implementation of the GET FiT concept, serving as an example for future roll-outs of GET FiT in other countries. As future GET FiT Programmes are implemented, the MEMD is happy to share its experiences and lessons learned in Uganda.

"The MEMD looks forward to a continued cooperation with GET FiT and its development partners in the coming years and is proud to be a pioneer in demonstrating the successful implementation of the GET FiT concept."

Robert Kasande

Permanent Secretary of MEMD

MESSAGE FROM NORWAY

The year 2018 has been an exciting year for the GET FiT Programme. Four more hydropower plants with a total capacity of 29 MW were commissioned and we congratulate the Government of Uganda, the Programme's development partners and the project developers on this achievement. In addition, important improvements of the grid infrastructure commenced during the second half of the year, which will improve the grid integration of the portfolio and have a lasting impact on the country's electricity sector and access targets.

For me personally, 2018 was a very special year in the GET FiT Programme, since I was present at the inauguration ceremony of the Nkusi hydropower project on the 11th of October. This remarkable story started with a walk in the Rwenzoris by some petroleum engineers based in Stavanger, Norway, a few years ago. They came up with an idea, followed by a lot of innovation, courage and financial guts. The engineers' ideas coincided with the roll-out of the GET FiT Programme, and the rest is history. The project will contribute to a wider, more reliable access to electricity for two million people living within reach of the Nkusi evacuation lines, including schools, health centers, businesses and industries. Nkusi is also an excellent example of job creation and "local content". The site team included Ugandans, South Africans, Peruvians and Norwegians, with 93-94 % Ugandan site staff in the final stages. The construction was challenging and involved drilling and blasting a 900 m long tunnel.

In addition to the GET FiT Programme, Norway has funded essential infrastructure for the distribution and transmission of electricity. During 2018, the high voltage line from Nkenda to Hoima was commissioned, financed with a NOK 300 million grant. The 225 kilometers line is a key part of the national electricity infrastructure, facilitating electricity evacuation and more efficient transmission from the power stations.

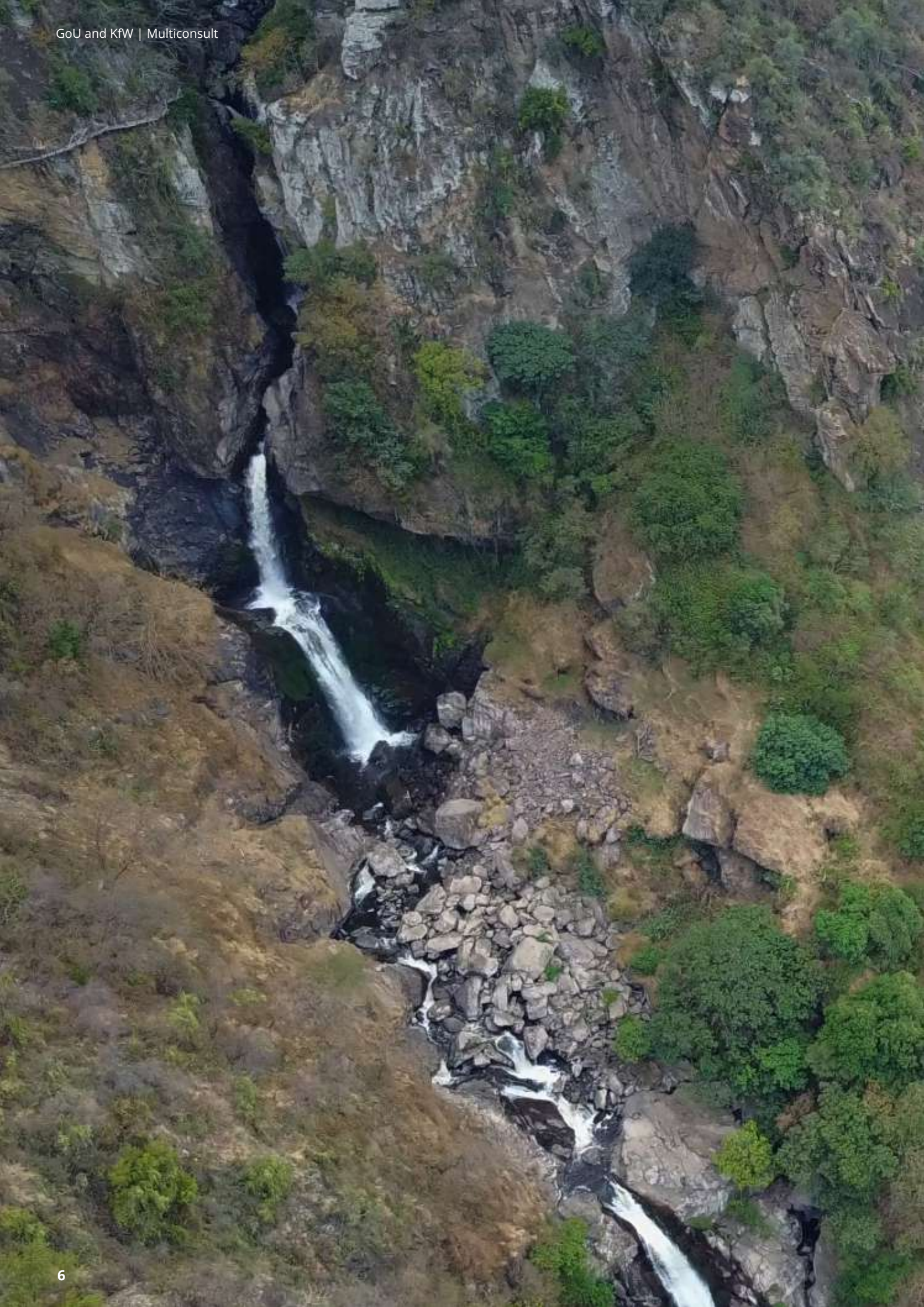
The great progress of the GET FiT Programme so far also comes with certain obstacles that need to be addressed and observed closely in the coming months. A timely completion of the grid infrastructure reinforcements is a central element that determines the successful commissioning of the remaining portfolio of projects under construction. On a sector level, a generation surplus is emerging, which will require significant efforts to increase demand and develop export routes.

The GET FiT Programme has demonstrated a successful Public Private Partnership in the development of Uganda's energy sector – serving as an example for future GET FiT Programme designs. As such, Norway is pleased to see that the GET FiT Programme is now also being rolled-out in other countries.

"The GET FiT Programme has demonstrated a successful Public Private Partnership in the development of Uganda's energy sector."

Susan Eckey

Ambassador of Norway



EXECUTIVE SUMMARY

Delivering infrastructure and energy. The GET FiT Uganda Programme made substantial progress in 2018. Four new hydropower projects with a total capacity of 29 MW were commissioned during the year, thus increasing the total installed capacity of the GET FiT portfolio to 87.1 MW. A total of ten projects, including seven hydropower projects, two solar projects and one bagasse project, are now operational and delivering renewable energy to the Ugandan grid. Overall, GET FiT projects generated a total of 271 GWh during 2018, corresponding to approximately seven percent of the total grid electricity supplied in the country.

Saving money with renewable energy. According to the system operator (Uganda Electricity Transmission Company Ltd. – UETCL) power from GET FiT projects represented a critical contribution in meeting national electricity demand over the past year. Due to delayed commissioning for Uganda's planned, large hydropower plants, and increasing demand for exports to Kenya due to problems with regional supply on its side of the border, UETCL has experienced a general shortage of supply and has been forced to dispatch thermal (HFO) plants to meet demand. Access to clean renewable energy delivered from GET FiT projects reduced the need for expensive thermal power, and contributed to estimated savings of more than USD 20 million and 180 000 tonnes in greenhouse gas (GHG) emission reductions in 2018.

With the expected commissioning of up to six additional hydropower projects in 2019, and ongoing efforts to resolve grid related issues for operational plants, the overall energy generation from the portfolio is expected to increase substantially in 2019. Depending on the commissioning of non-GET FiT power plants, it is expected that the entire portfolio could contribute up to 18 % of the total electricity generation in Uganda in the interim period.

Investment Climate. GET FiT Uganda has clearly demonstrated its potential for private sector development. It is not only contributing through the development of additional, technologically and geographically diversified renewable energy capacity in the country, but has also had a considerable impact on the overall power sector of Uganda. As of 2018, the Programme has leveraged over USD 450 million in private investments, including USD 160 million of private commercial financing. After closing the GET FiT funding window, the private sector interest in renewable energy development has remained very high in Uganda, with a range of solar, hydro and biomass projects now being developed without subsidies.

Job creation. With a continued high level of construction activities in 2018, job creation from the portfolio continues to be substantial. Since the Programme was launched in 2013, an accumulated total of over 8,500 jobs have now been created through the project portfolio, with nearly 90 percent of those jobs being occupied by Ugandan staff. This refers to direct jobs only, associated with development construction and operation of the respective power plants. The potential indirect job creation due to e.g. local economic growth is not included but is expected to be significant.

Additionally, while long-term effects of the Programme are still to be observed, indications of increased sector and regulatory capacity can already be reported in 2018: ERA has reported substantially reduced review and processing time of generation licence applications, as well as increasingly timely and complete reporting of licensees. The strengthened capacity of ERA not only benefits development of small IPPs, but also the Ugandan power sector as a whole.

Portfolio output and performance. The operational part of the GET FiT portfolio (87.1 MW) is distributed across 47.1 MW in hydropower projects, 20 MW in solar PV projects and 20 MW in bagasse. The portfolio delivered a total of 271 GWh to the Ugandan grid in 2018:

- For the hydropower projects, both in Western and Eastern Uganda, a normal hydrological year was experienced, which under normal circumstances would have led to normal production levels. However, four hydropower projects were only commissioned in mid-2018, which reduced the overall annual output on a full year basis. In addition to this, grid constraints have hindered full power evacuation in some cases.

- For the two solar projects in Eastern Uganda, Soroti (10 MW) and Tororo (10 MW), a normal year was experienced with respect to solar insolation and normal production levels were achieved. The GET FiT solar projects arguably have paved the way for Uganda's solar energy adventure, which continued through the commissioning of an additional 20 MW of grid-connected solar PV in 2018. A range of other projects are under development by commercial investors.

- For the Kakira bagasse co-generation plant (20 MW), energy generation was doubled in 2018 after several years of severe shortage of sugar cane supply. However, the current generation levels are still only at 60 percent of planned generation. Some further improvement is expected in 2019 due to anticipated increase in Kakira's own cane supply.

Construction progress. Most of the remaining seven hydropower projects which are still under construction are expected to be commissioned in 2019. One or two will be completed in 2020. Actions were taken by the Programme to minimise commissioning delays beyond the original 2018 funding window, including additional supervision visits, and application of incentives such as financial penalties in the form of subsidy reductions. While developers certainly have made substantial efforts, poor progress on certain design and construction works might lead to further delays for some projects. Active GET FiT supervision and assistance will therefore be maintained in the upcoming year for a continued push towards a fully commissioned portfolio including close monitoring of environmental and social compliance.

Grid Integration. The successful grid integration of the portfolio remains a challenge for the Programme, both in terms of full evacuation of commissioned projects and the development of grid connection infrastructure for projects under construction. GET FiT Uganda development partners have provided considerable additional funding towards important investments in the reinforcement of the national and local grid infrastructure to facilitate power evacuation from GET FiT projects. While contractors were mobilised in 2018 for some of the most critical components, other reinforcement needs are still not properly addressed. This represents an operational, financial and reputational risk to the Ugandan power sector and to the GET FiT Programme. GET FiT maintains a close dialogue with the Government of Uganda agencies to facilitate high-level attention and coordination in fast-tracking the grid infrastructure which will continue in the forthcoming year.

Technical Assistance. Two Technical Assistance components for the Electricity Regulatory Authority (ERA) were concluded in 2018. A new framework for licensee reporting was put in place, and a new regulation for determining financial and economic returns for licensees in the power sector was established. The latter will greatly improve ERA's ability to conduct constructive negotiations with entities that want to invest in power sector infrastructure in Uganda and to ensure levels of returns that are economically viable to the benefit of Ugandan consumers, while also reflecting benchmark costs and maintaining private

sector attractiveness. Another milestone project for ERA is the implementation of a new Regulatory Information Management System (RIMS). The digitalisation of core ERA processes, including licence applications and reporting, will further cement the position of ERA as one of the most progressive power sector regulators in Africa. Further, as part of a twinning arrangement, ERA and the Implementation Consultant (Multiconsult) are developing checklists for institutionalisation at ERA, papers for international publications, and are in continued dialogue on key technical, environmental and social issues of power projects. This knowledge transfer is a key element of the GET FiT exit strategy.

Outlook. 2019 will surely be an exciting yet challenging year for the Programme, with up to six of the seven remaining hydropower projects set for commissioning. These will require close follow up, particularly related to implementation of adequate grid infrastructure. GET FiT grid interventions are due for completion during the year, which will positively affect the evacuation of operational plants and increase the portfolio's generation. To ensure a timely and smooth implementation process, GET FiT will continue to push stakeholders on fast-tracking critical grid upgrades in 2019.

The Ugandan power sector appears more vibrant than ever, with a booming interest from the private sector. The successful implementation of seventeen IPPs under GET FiT has clearly set a new standard for what is possible with private sector mobilisation, thereby freeing up scarce public resources in times of rising debt. Notably and highly encouragingly, there is now an increasing interest from the private sector in other areas of the power sector as well, e.g. for development of transmission projects, large power plants, and off-grid electricity development. Although there are many challenges ahead, such as a growing generation surplus, and uncertainties remain, the general private sector interest is good news for Uganda and bodes well for exciting times ahead.

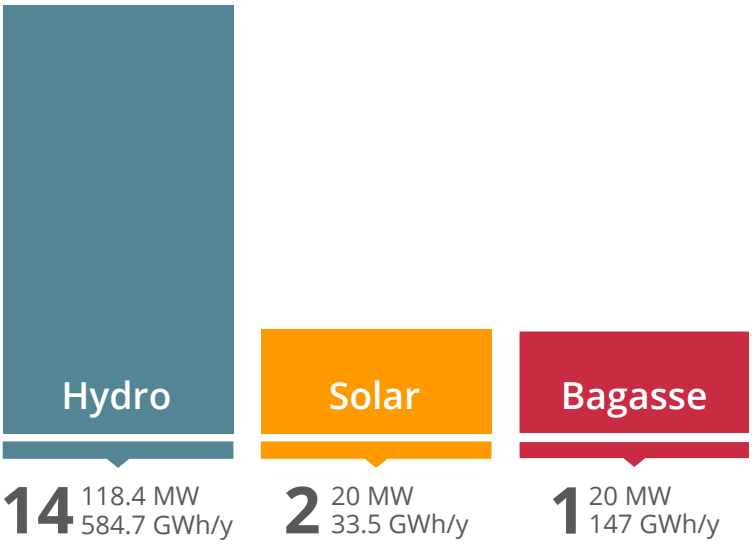
With continued, targeted efforts at the project level and sector level, the overall impact of the GET FiT Programme will be further strengthened in the upcoming year. The diverse project portfolio will, more than ever, offer affordable renewable energy to Ugandan consumers, contributing to clean and sustainable power sector development, improved security of power supply, power quality and grid stability.

GET FiT PORTFOLIO

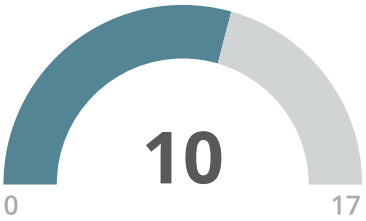
17
RE Projects

158 MW

765 GWh/y

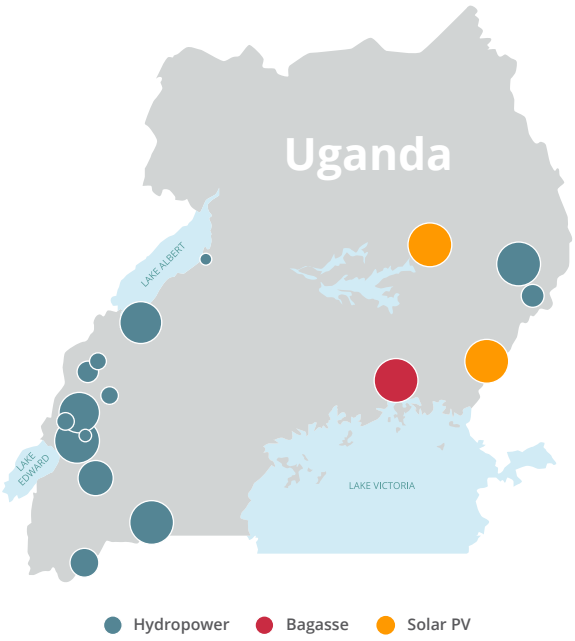


Projects Commissioned

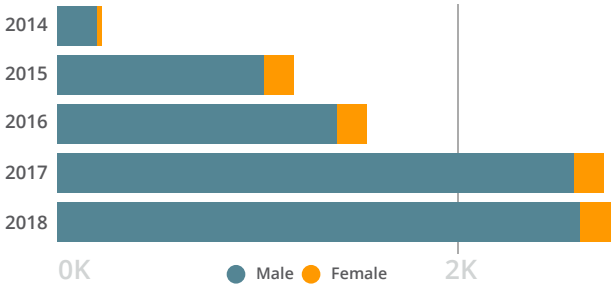


Capacity Installed

55% Of Portfolio Capacity Installed (MW)

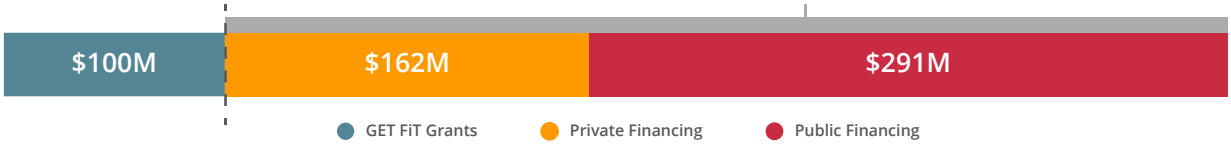


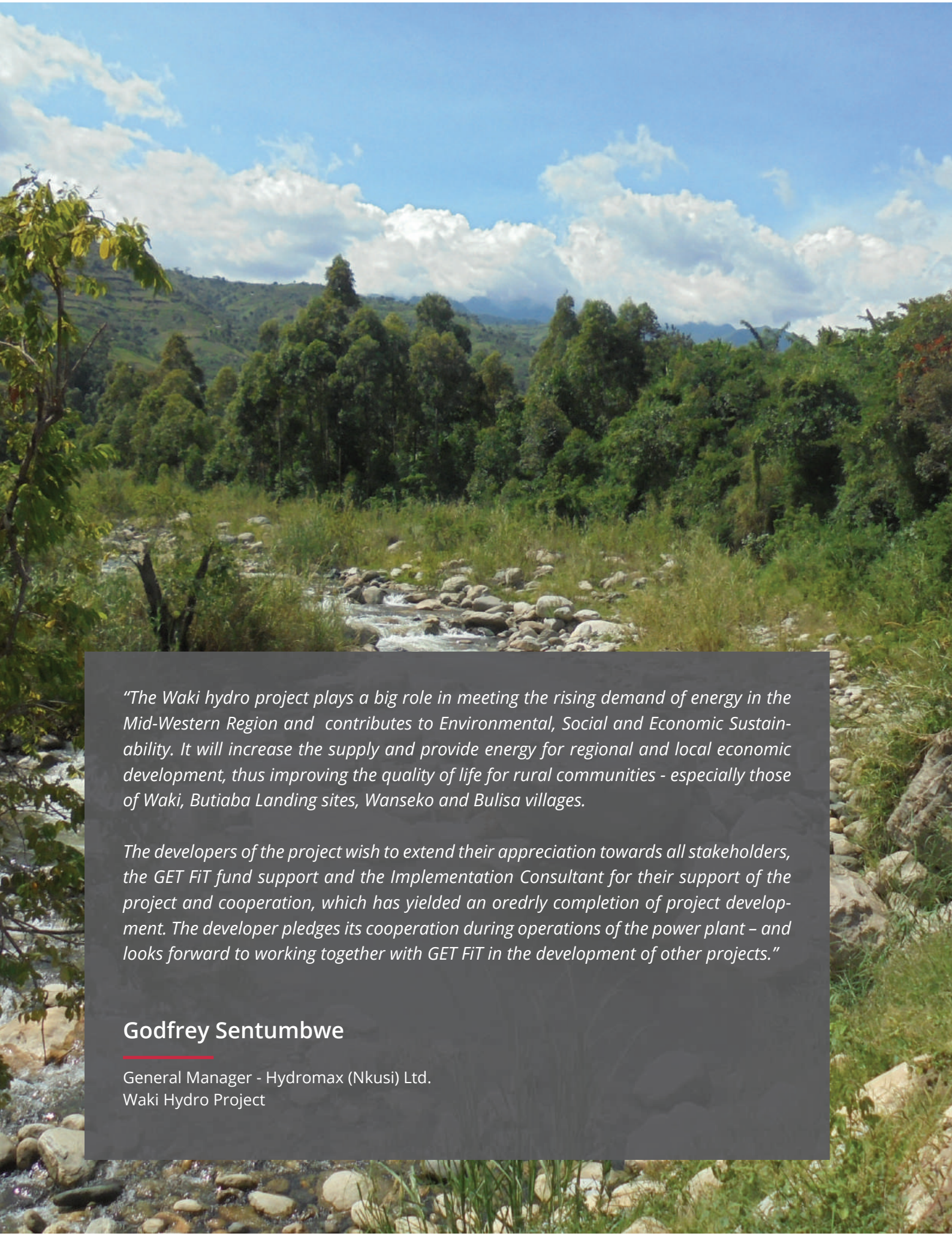
Jobs Created
8,568
Ugandan Employment
89%



4.5 GET FiT Leverage Ratio

453 Million USD in Private Investments Leveraged





"The Waki hydro project plays a big role in meeting the rising demand of energy in the Mid-Western Region and contributes to Environmental, Social and Economic Sustainability. It will increase the supply and provide energy for regional and local economic development, thus improving the quality of life for rural communities - especially those of Waki, Butiaba Landing sites, Wanseko and Bulisa villages.

The developers of the project wish to extend their appreciation towards all stakeholders, the GET FiT fund support and the Implementation Consultant for their support of the project and cooperation, which has yielded an oredrly completion of project development. The developer pledges its cooperation during operations of the power plant – and looks forward to working together with GET FiT in the development of other projects."

Godfrey Sentumbwe

General Manager - Hydromax (Nkusi) Ltd.
Waki Hydro Project

TABLE OF CONTENTS

LIST OF ABBREVIATIONS / ACRONYMS

COD	Commercial Operation Date
CP	Condition Precedent
BEIS	Department for Business, Energy & Industrial Strategy
DFA	Developer Finance Agreement
DFID	Department for International Development, UK
EPC	Engineering, Procurement and Construction (a form of contract)
ERA	Electricity Regulatory Authority
E&S	Environmental and Social
ESIA	Environmental and Social Impact Assessments
ESMP	Environmental and Social Action Plan
ESAP	Environmental and Social Management Plan
EU ITF	European Union Infrastructure Trust Fund
GFPPM	GET FiT Premium Payment Mechanism
GHG	Greenhouse Gas
GoU	Government of Uganda
GWh	Gigawatt Hours
HFO	Heavy Fuel Oil
HV	High Voltage
IA	Implementation Agreement
IC	Investment Committee
IDA	International Development Association
IFC	International Finance Corporation
IPP	Independent Power Producer
KfW	Kreditanstalt für Wiederaufbau
LRP	Livelihood Restoration Plan
MEMD	Ministry of Energy and Mineral Development
MoFPED	Ministry of Finance, Planning and Economic Development
M&E	Monitoring & Evaluation
MtCO2e	Million Tonnes of Carbon Dioxide Equivalent
MW	Megawatts (of installed power capacity) 1 MW = 1000 kilowatts

MV	Medium voltage
PAP	Project Affected Person
PPA	Power Purchase Agreement
PPP	Public-Private Partnership
PRG	Partial Risk Guarantee
PS	Performance Standards (IFC)
RAP	Resettlement Action Plan
RE	Renewable Energy
REA	Rural Energy Agency
RFP	Request for Proposal
RFQ	Request for Quotation
RoE	Return on Equity
SC	Steering Committee
SHP	Small Hydropower Plant
SPCC	Sector Planning and Coordination Committee
SSA	Sub-Saharan Africa
TA	Technical Assistance
UEDCL	Uganda Electricity Distribution Company Limited
UETCL	Uganda Electricity Transmission Company Limited

01 ABOUT GET FiT UGANDA

The GET FiT Uganda Programme was officially launched on May 31st, 2013. The Programme, which has been developed by the Government of Uganda and the Electricity Regulatory Authority (ERA), in close cooperation with KfW Development Bank, is designed to leverage private investment into renewable energy generation projects in Uganda. GET FiT is being supported by the Governments of Norway, the United Kingdom, Germany and the EU through the EU Africa Infrastructure Fund.

The main objective of the GET FiT Programme is to assist Uganda in pursuing a climate resilient low-carbon development path resulting in growth, poverty reduction and climate change mitigation by facilitating private sector involvement and improving the framework conditions for private investments in renewable energies. In Uganda, GET FiT is fast-tracking a portfolio of 17 small-scale renewable energy (RE) projects, promoted by private developers and with a total installed capacity of 158 MW. This will yield approximately 765 GWh of clean energy production per year, transforming Uganda's energy mix within a period of 3-5 years, and resulting in:

- Emission reductions of roughly 10 million tonnes of CO2 in the 20-year lifespan of Power Purchase Agreements (PPAs).
- An increase in Uganda's energy production by about 20 %, and thus a contribution to tackling an anticipated supply shortage in the period up to 2020.
- Facilitating (or significantly improving) access to energy for at least 200,000 additional households (approximately 1.2 million people) due also, in rural areas, to strengthening of regional grids.
- Leveraging of more than USD 450 million in public and private investments for renewable energy (RE) generation projects with a limited amount of results-based grant funding.

A more comprehensive description of the specific tools and approaches applied by GET FiT to address the challenges faced in the Ugandan power sector, the governance structure of the Programme and, key activities and achievements so far, is found in the GET FiT Annual Reports produced since 2013 **(www.getfit-reports.com).**

02 PROJECT PORTFOLIO PROGRESS

2.1 Portfolio Status

Progress

A further four small hydropower projects (SHP) achieved commercial operation during 2018 – Nyamwamba SHP, Lubilia SHP, Nkusi SHP, and Waki SHP – adding an additional 29.0 MW of power capacity to the Ugandan grid. Combined with the six projects already operational by the end of 2017, the total installed capacity of operational GET FiT supported projects is now 87.1 MW – approximately 55 % of the total installed capacity to be implemented under the Programme (158.4 MW).

As a result, GET FiT supported projects supplied 271 GWh to the grid during 2018, corresponding to approximately seven (7) percent of the total grid electricity supplied in Uganda. Cumulatively, the overall power supplied to the Ugandan grid by GET FiT supported projects thus far has totalled more than 410 GWh, equivalent to a saving of approximately 450,000 tonnes of CO2 due to displacement of power production from fossil fuelled electricity production.

Challenges in 2018

Construction progress during 2018 was again noticeably variable across the portfolio, with some developers and projects performing substantially better than others. GET FiT continued to more closely monitor progress of the remaining projects and tried to incentivise developers to complete construction and enable commissioning in a timely manner. For selected projects this included increasing the frequency of supervision visits at the cost of the developer; enforcing stops in construction where there were clear deficiencies in the developers' capacity to plan and implement the projects in a timely, safe, and responsible manner; and imposing reductions in the overall subsidy amount allocated to the project where there was continued non-compliance with Programme requirements.

Several SHP's were requested to partially stop construction during the first half of 2018 due to excessive levels of damage caused by construction approaches in steep terrain and close to rivers, or the risk of such damage due to the proposed construction approaches. Three of the projects modified their construction methodologies and/or the design of key project structures significantly, which was welcome in terms of minimising adverse impacts but resulted in programme delays, which were necessary in order to plan and implement the alternative approaches. A further project also experienced delays due to a naturally occurring landslide, which resulted in important design changes to improve the robustness of key project structures.

Two of the projects received a financial penalty during the first half of 2018 in the form of a subsidy reduction, a contractual mechanism used to improve compliance of the developers. These projects had received a warning of another subsidy reduction, in order to improve performance and construction practices and to minimise as far as reasonable possible adverse environmental and social impacts. For both projects, the threat of further subsidy reductions persists into Q1 2019. One project, which had already experienced substantial delays due to transboundary coordination issues, experienced a major setback as the Developer replaced the EPC Civil Contractor during the first half of 2018.

The Finishing Line

With most of the remaining projects on the home straight to achieving commercial operation in the coming year, the majority of planned GET FiT supported projects will be supplying the grid before the end of 2019.

The remaining seven SHPs still to achieve commercial operation are Kikagati, Kyambura, Ndugutu, Nyamagasani 1 and 2, Sindila, and Siti 2 SHPs. For these projects, key design decisions had largely been resolved, construction was well underway, and the procurement of critical equipment and materials had either been completed or was well advanced. Nonetheless, a considerable volume of construction works was still to be completed and several projects have challenges still to overcome. The timely implementation of power evacuation infrastructure, to connect the projects to the grid and ensure reliable evacuation continues to be a major issue for many of the remaining projects.

Table 1 summarises the status of key project milestones across the portfolio. Milestones that have been achieved are indicated by green cells, whereas the remainder are shown by the white or grey cells. The expected dates for key milestones that have not yet been achieved are shown. As indicated, most of the remaining projects are aiming to achieve commercial operation by the middle of 2019, whereas the experience of the GET FiT team and observed progress and capacity of the developers during 2018 indicates that some projects will be extended to much later in 2019 before achieving commercial operation.

No.	Project	Generation License	Developer Financing Agreement (DFA)	Power Purchase Agreement (PPA)	Financial Close	Construction start	Commissioning[1]
1	Rwimi	✓	✓	✓	✓	Q3 2015	**Q4 2017**
2	Nyamwamba	✓	✓	✓	✓	Q4 2015	**Q2 2018**
3	Waki	✓	✓	✓	✓	Q2 2015	**Q4 2018**
4	Siti I	✓	✓	✓	✓	Q1 2015	**Q2 2017**
5	Siti II	✓	✓	✓	✓	Q3 2016	**Q2-Q3 2019**
6	Lubilia	✓	✓	✓	✓	Q1 2016	**Q2 2018**
7	Kakira Cogen	✓	✓	✓	✓	Q2 2012	**Q2 2014**
8	Sindila	✓	✓	✓	✓	Q1 2017	**Q1 2019**
9	Muvumbe	✓	✓	✓	✓	Q3 2015	**Q2 2017**
10	Soroti Solar	✓	✓	✓	✓	Q1 2016	**Q4 2016**
11	Tororo Solar	✓	✓	✓	✓	Q1 2017	**Q3 2017**
12	Kikagati	✓	✓	✓	Q2 2019	Q4 2017	**Q2 2020**[2]
13	Nyamughasani 1	✓	✓	✓	✓	Q1 2017	**Q1 2020**
14	Nyamughasani 2	✓	✓	✓	✓	Q1 2017	**Q3 2019**
15	Ndugutu	✓	✓	✓	✓	Q2 2017	**Q3 2019**
16	Kyambura	✓	✓	✓	✓	Q3 2017	**Q3 2019**
17	Nkusi	✓	✓	✓	✓	Q2 2015	**Q2 2018**

Table 1 – Project Milestones Overview

[1] *Based on GET FiT estimates when developers are likely to complete commissioning tests.*

[2] *As acknowledged in the 2017 Annual Report, GET FiT recognises the unique transboundary challenges experienced by the Kikagati SHP and the resulting impact on the implementation timeframe. Delays were further exacerbated during the first half of 2018 by key changes in contracting arrangements – further details are provided in Section 2.2.*

Consequences of Achieving COD during 2019

As outlined above, several GET FiT supported SHPs did not achieve commercial operation before the end of the 2018 calendar year, the end of the original window for GET FiT support. The GET FiT Steering Committee therefore resolved that, at the discretion of the GoU, represented by KfW, the contractual deadline for achieving commercial operation would be extended from 31 December 2018 to 31 October 2019. Furthermore, in order to incentivise developers to achieve commercial operation as early as possible during 2019, the following would apply:

- No disbursements of subsidy payments will be made after 2023 and therefore projects that achieve COD after 2018 will be subject to subsidy reductions.
- Developers would be required to cover any additional costs resulting from the continued follow-up and supervision of their individual projects by GET FiT beyond 2018.

Expected Portfolio Output

An overview of the total planned installed capacity of the portfolio and how it is distributed across the supported technologies is presented in Figure 1. The overall portfolio capacity amounts to a total of 158.4 MW, representing approximately 93 percent of the original Programme target of 170 MW. The difference between the planned capacity of the current portfolio and the original targets is partly due to a reduction in the overall Programme funding in earlier years combined with a lower share of bagasse/biomass than originally anticipated. Nonetheless, adding an installed capacity of more than 150 MW to the Ugandan electricity supply network is a significant achievement and truly reflects the successful impact of the GET FiT Programme.

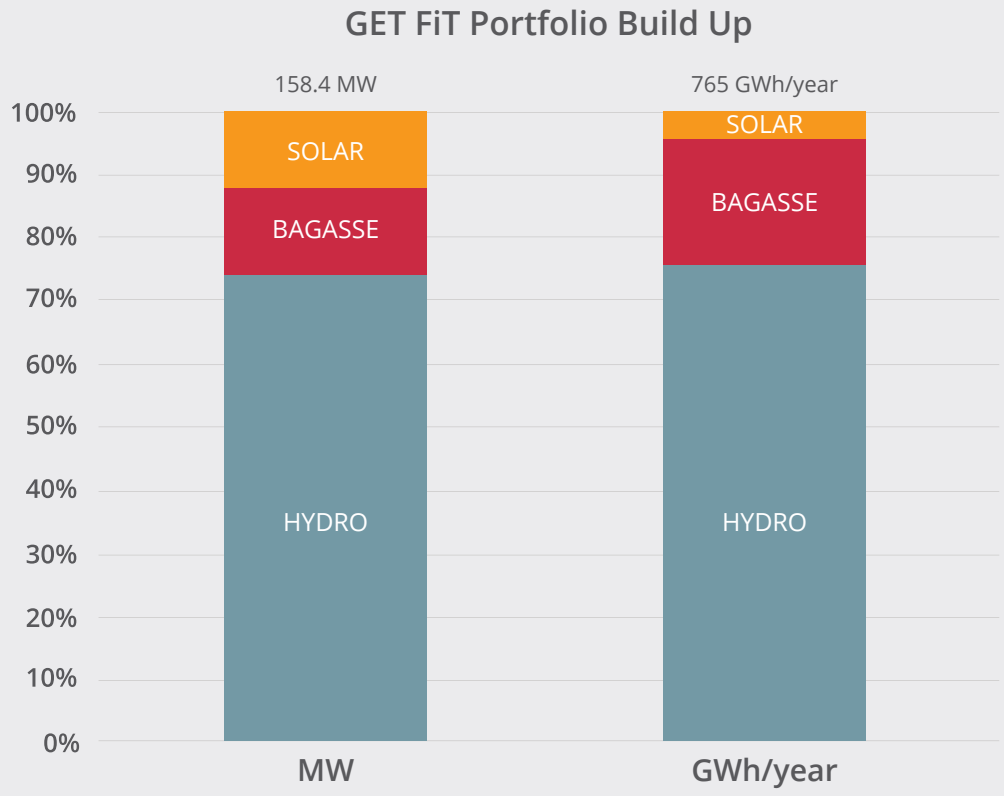


Figure 1 - GET FiT Portfolio Build Up

Figure 2 provides a schematic illustration of the merit order effect of the GET FiT portfolio at the end of 2018 (includes the current installed capacity of 87.1 MW). The merit order effect refers to the reduction of highly priced peak energy that the utility needs to buy: As indicated in the graph, the GET FiT portfolio (green area) is off-setting expensive thermal generation (grey area) that is associated with high GHG emissions. Due to GET FiT approximately 13 % of total generation capacity has been added, thereby reducing generation from the heavy fuel oil (HFO) plants in the country.

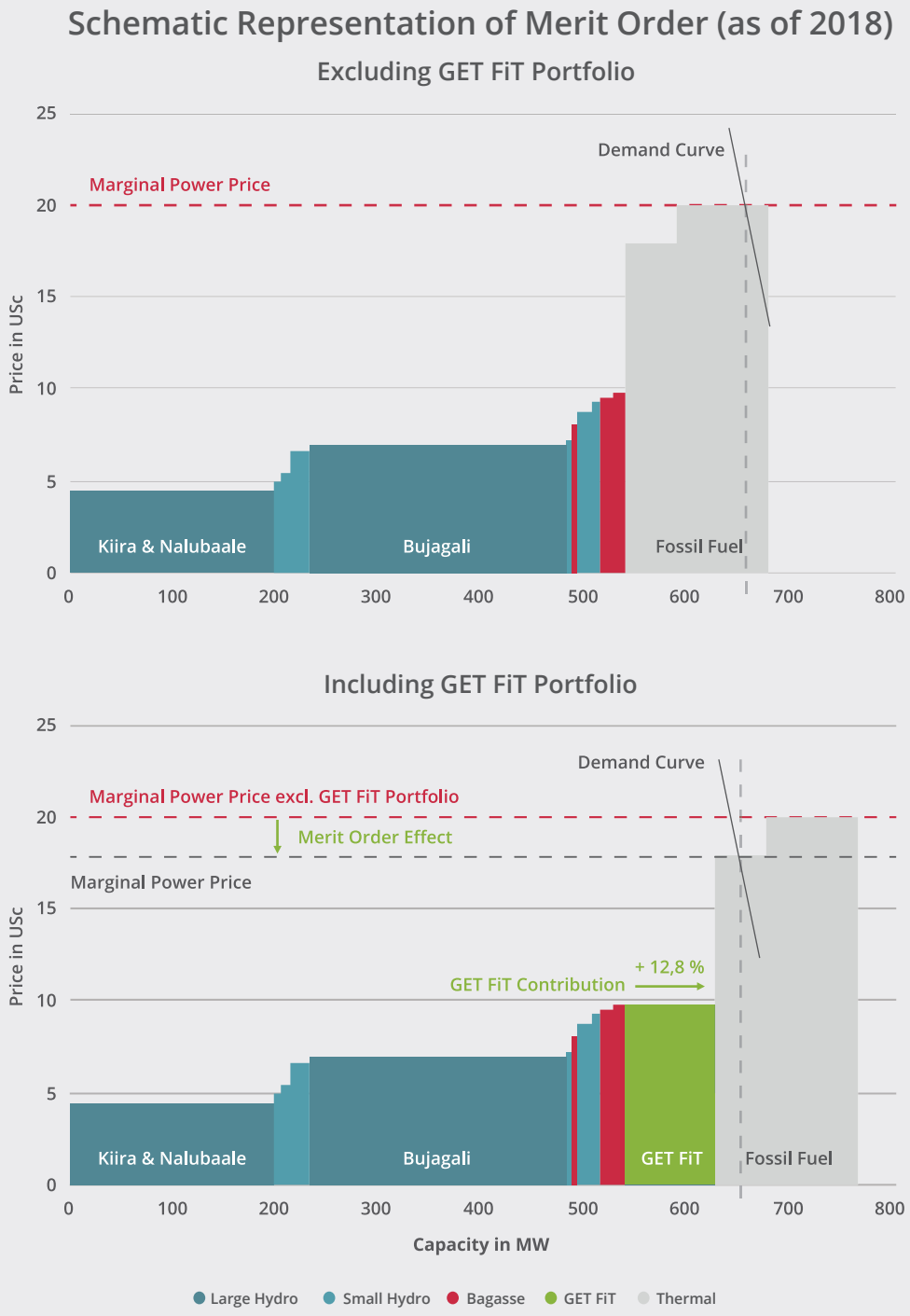


Figure 2 – Schematic Representation of Uganda's Merit Order and the Effect of the GET FiT Portfolio

Note: *The merit order effect is expressed in marginal energy price, not average energy price. Both thermal power plants have 7 MW generation guaranteed in their PPA. Additionally, most powerplants have take-or-pay PPAs. Therefore, the illustration is only a schematic representation of the effects.*

2.2 Projects

In the following sections, the projects of the GET FiT portfolio will be described in more detail, highlighting notable developments and project generation[3] in 2018. Figure 3 provides an overview of the location of the respective projects of the portfolio.

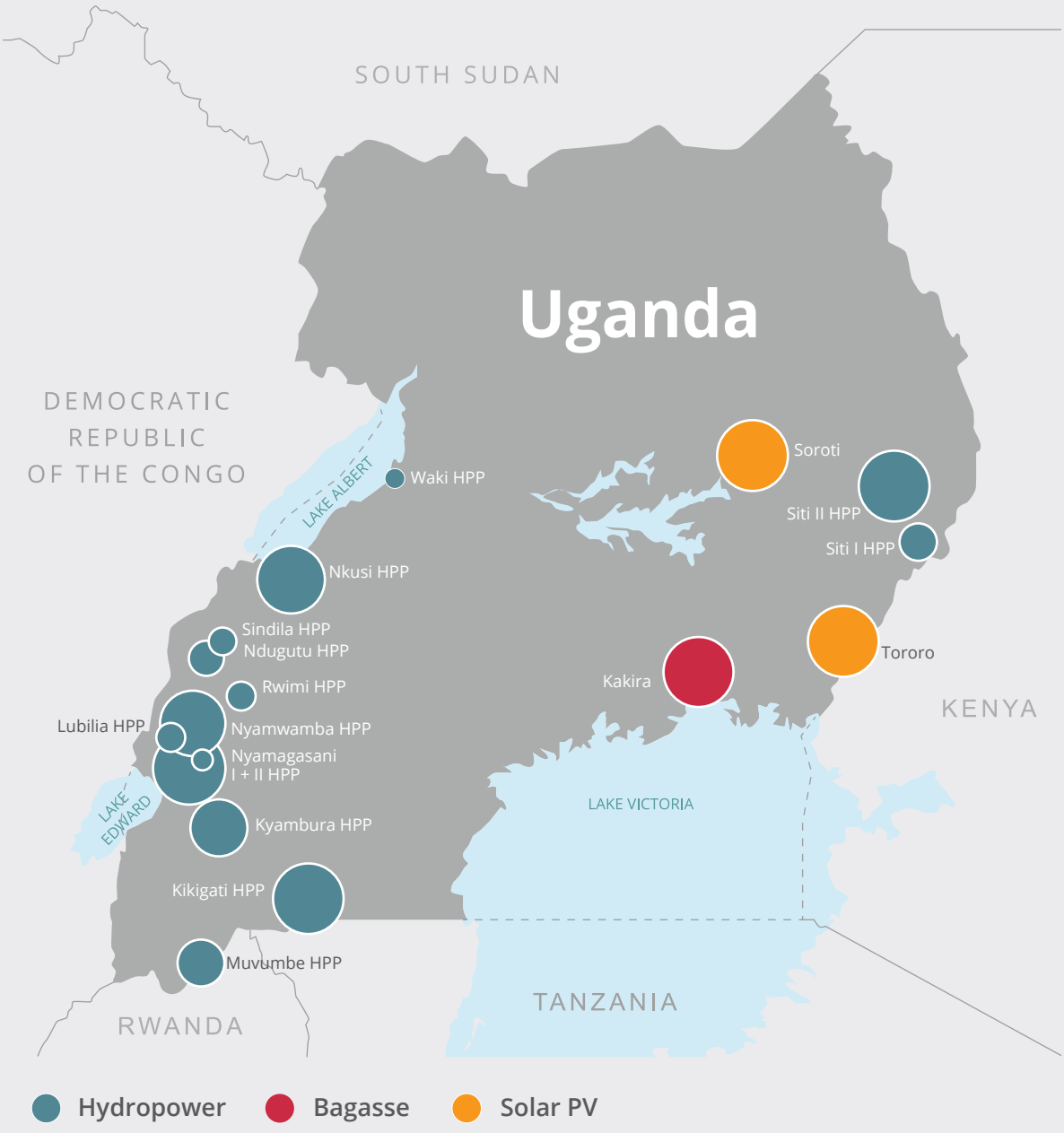


Figure 3 - Map of GET FiT Portfolio

[3] *Generation data is presented as provided by developers. The accuracy and appropriateness of the generation levels presented in the following sections will be reviewed by GET FiT only upon submission as per contractually agreed procedures.*

Siti 1
Operational

This run-of-river hydropower plant is located in Bukwo District in Eastern Uganda. The Project commenced construction in February 2015, started evacuating power to the grid during May 2017 at reduced capacity due to issues with the quality and stability of the power evacuation line, and formally achieved its commercial operation date (COD) in August 2017 following improvements to the line.

During 2018, the first full calendar year of operation, the Project delivered 19.7 GWh of energy to the grid. Substantial grid failures and outages continued throughout 2018 and were approximately equivalent to 26 % of the potential plant output (energy delivered plus deemed energy), which is especially high. The long-term power evacuation solution for the Siti 1 SHP, and the Siti 2 SHP further downstream comprises a new 132 kV transmission line between Mbale and Bulambuli, which is expected to substantially improve the reliability of power evacuation from the plant. The line is not expected to be completed before 2021.

Adjusting for the partial availability of the power evacuation line, the cumulative energy output of the plant during 2018 would instead have been 26.6 GWh, approximately equivalent to 106 % of the average energy estimated at application stage. Combined with the output generated in 2017, the Project has so far delivered a total of 31.1 GWh to the Ugandan grid.

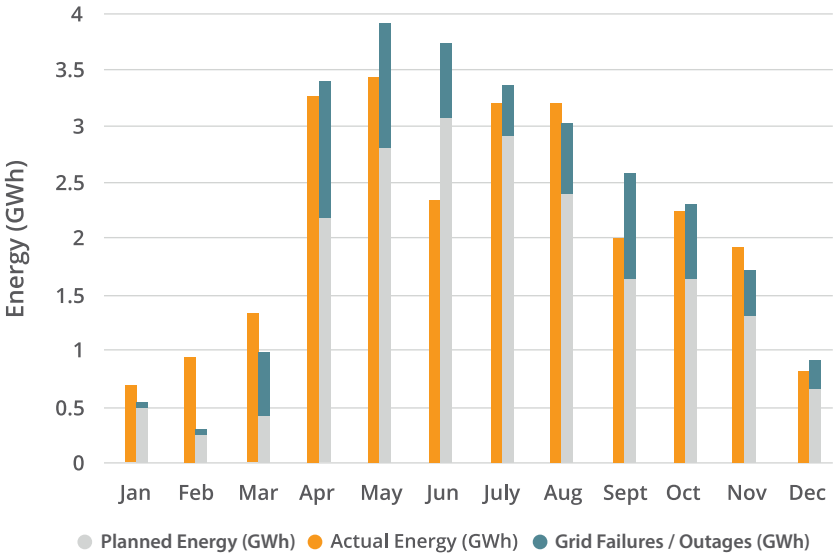
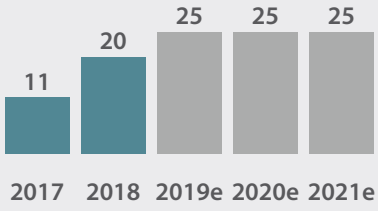


Figure 4 - Siti 1 SHP - Planned versus Actual Energy Output (2018)

Hydro

Capacity (in MW)	6.1
Planned Generation (in GWh/year)	25.0
Total Investment (in USD)	15.0M
GET FiT Commitment (in USD)	3.6M

Annual Generation
(in GWh)



Muvumbe SHP

Operational

This run-of-river hydropower project is located in Kabale District in South-Western Uganda. The Project commenced construction in September 2015 and achieved its COD by mid-May 2017.

During 2018, the first full calendar year of operation, the Project delivered 28.1 GWh of energy to the grid. Grid failures and outages were approximately equivalent to 12 % of the potential plant output (energy delivered plus deemed energy), slightly lower than the 14 % observed during 2017, but still relatively high. Adjusting for the partial availability of the power evacuation line, the cumulative energy output of the plant would instead have been 31.8 GWh, approximately equivalent to 101 % of the average energy estimated at application stage. Combined with the output generated in 2017, the Project has so far delivered a total of 50.0 GWh to the Ugandan grid.

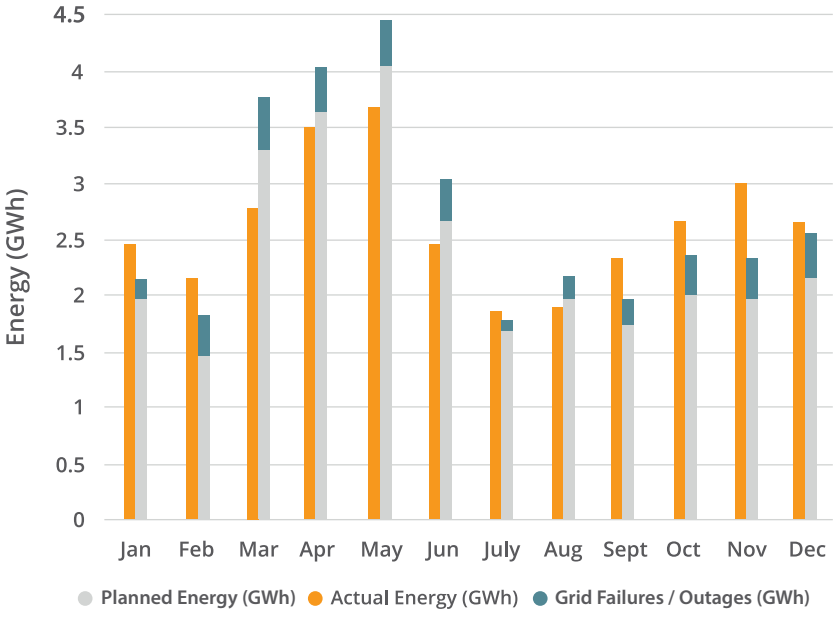


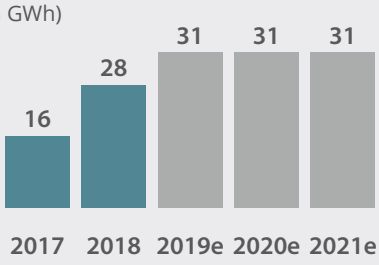
Figure 5 - Muvumbe SHP – Planned versus Actual Energy Output (2018)

Hydro

Capacity (in MW)	6.5
Planned Generation (in GWh/year)	31.0
Total Investment (in USD)	12.5M
GET FiT Commitment (in USD)	4.5M

Annual Generation

(in GWh)



Rwimi SHP

Operational

This run-of-river hydropower project is located in Kasese and Kabarole Districts in Western Uganda. The Project commenced construction in July 2015 and achieved its COD by mid-October 2017.

During 2018, the Project delivered 28.5 GWh of energy to the grid. Grid failures and outages were approximately equivalent to 2 % of the potential plant output (energy delivered plus deemed energy), lower than the 8 % observed during 2017. Adjusting for the partial availability of the power evacuation line, the cumulative energy output of the plant would instead have been 29.1 GWh, approximately equivalent to 108 % of the average energy estimated at application stage. Combined with the output generated in 2017, the Project has so far delivered a total of 35.4 GWh to the Ugandan grid.

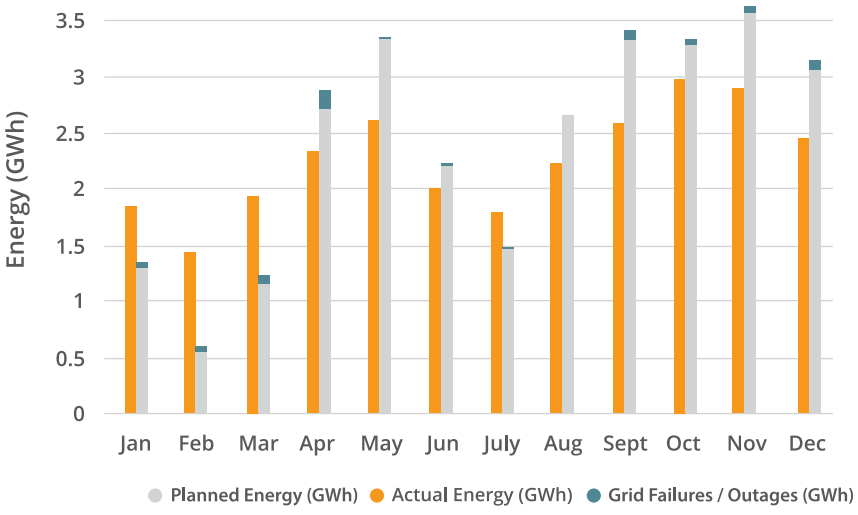


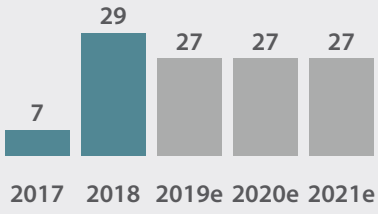
Figure 6 - Rwimi SHP - Planned versus Actual Energy Output (2018)

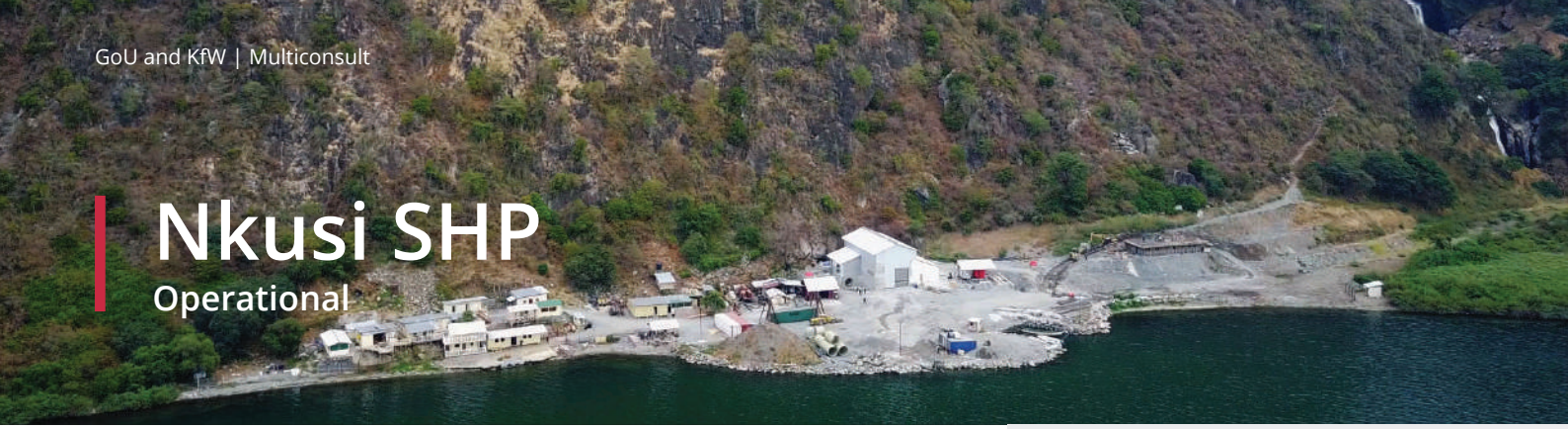
Hydro

Capacity (in MW)	5.5
Planned Generation (in GWh/year)	27.0
Total Investment (in USD)	19.9M
GET FiT Commitment (in USD)	3.9M

Annual Generation

(in GWh)





Nkusi SHP

Operational

This run-of-river hydropower plant is located in the Kibaale and Hoima Districts in Western Uganda. The Project commenced construction during October 2015 and achieved its COD by mid-June 2018.

Since achieving commercial operation, the Project delivered a total of 29.3 GWh of energy to the grid. During the first six full months of operation (from July onwards), grid failures and outages were substantial and equated to approximately 28 % of the potential plant output (energy delivered plus deemed energy) due to capacity constraints in the current distribution grid. The construction of an alternative power evacuation route towards Hoima is expected to be completed during Q1 2019, which will enhance the network's robustness and likely reduce the outages and the deemed energy risk to GoU.

Adjusting for the partial availability of the power evacuation line unavailability, the cumulative energy output of the plant during 2018 would instead have been 37.0 GWh, approximately equivalent to 131 % of the average energy for the same six-month period of operation estimated at application stage.

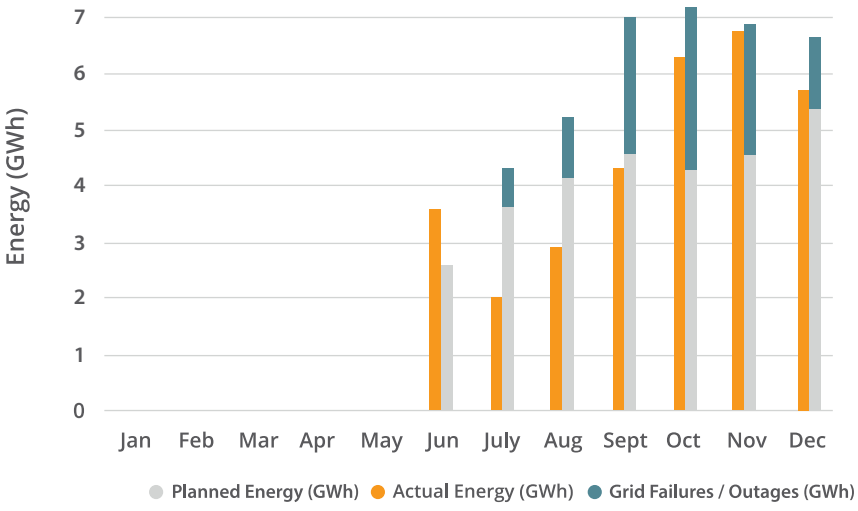


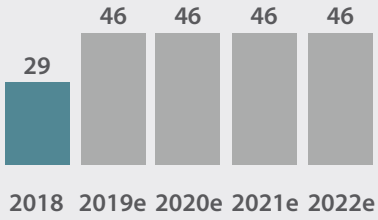
Figure 7 - Nkusi SHP - Planned versus Actual Energy Output (2018)

Hydro

Capacity (in MW)	9.6
Planned Generation (in GWh/year)	46.0
Total Investment (in USD)	19.6M
GET FiT Commitment (in USD)	2.8M

Annual Generation

(in GWh)



Nyamwamba SHP

Operational

This run-of-river hydropower plant is located in Kasese District in Western Uganda. The Project commenced construction in October 2015 and achieved its COD by the end of April 2018.

In 2018 the Project delivered a total of 30.4 GWh of energy to the grid. During the first eight full months of operation (from May onwards), grid failures and outages were approximately equivalent to 6 % of the potential plant output (energy delivered plus deemed energy) – the lowest outages reported for any of the connected GET FiT supported small hydropower projects. Adjusting for partial availability of the power evacuation line, the cumulative energy output of the plant during 2018 would instead have been 32.9 GWh, approximately equivalent to 95 % of the average energy estimated at application stage.

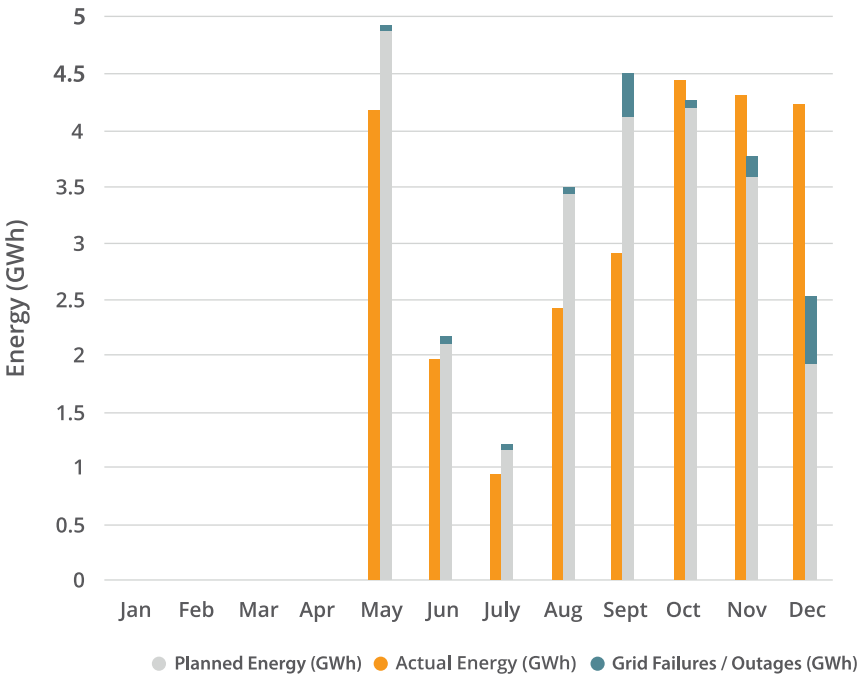


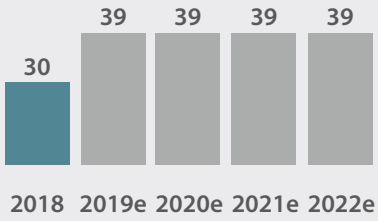
Figure 8 - Nyamwamba SHP - Planned versus Actual Energy Output (2018)

Hydro

Capacity (in MW)	9.2
Planned Generation (in GWh/year)	39.0
Total Investment (in USD)	28.7M
GET FiT Commitment (in USD)	5.8M

Annual Generation

(in GWh)



Lubilia SHP

Operational

This run-of-river hydropower plant is located in Kasese District in Western Uganda. The Project commenced construction in March 2016 and achieved its COD by early April 2018.

In 2018 the Project delivered a total of 13.8 GWh of energy to the grid. During the first full nine months of operation (from April onwards), grid failures and outages were approximately equivalent to 12 % of the potential plant output (energy delivered plus deemed energy). Adjusting for the partial availability of the power evacuation line, the cumulative energy output of the plant during 2018 would instead have been 15.7 GWh, approximately equivalent to 88 % of the average energy for the same nine-month period of operation estimated at application stage.

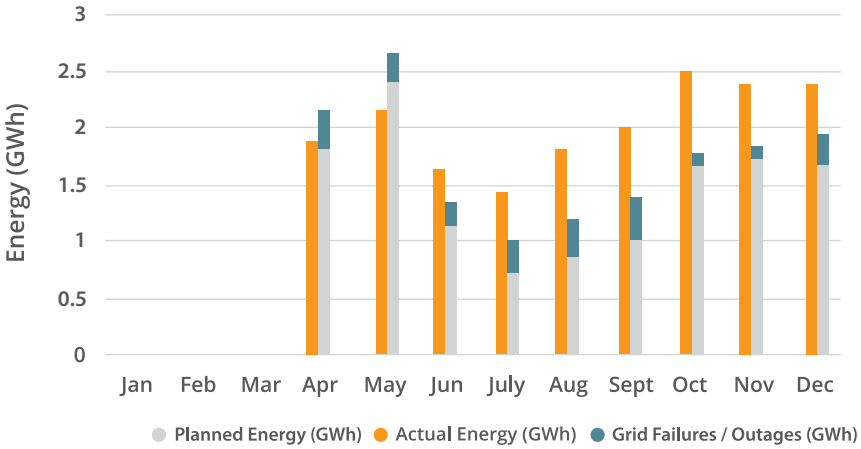


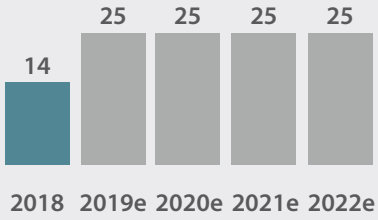
Figure 9 - Lubilia SHP - Planned versus Actual Energy Output (2018)

Hydro

Capacity (in MW)	5.4
Planned Generation (in GWh/year)	25.0
Total Investment (in USD)	16.0M
GET FiT Commitment (in USD)	3.2M

Annual Generation

(in GWh)



Tororo Solar PV

Operational

The Tororo Solar PV project is located just outside Tororo Town in the Tororo District, Eastern Uganda. The 10 MW plant has 32,240 solar modules on 14 hectares of land and became the second grid-connected solar power plant in Uganda. The Project commenced commercial operations in September 2017.

The facility operated to expected and forecast performance levels and showed no major issues or concerns for the first year of operations. The Project has not reported any deemed energy in 2018. Total generation during the year equalled approximately 15.8 GWh, in line with the planned annual generation.

The owners, Tororo Solar North Ltd., part of the Building Energy Group, finished the construction of an Early Childhood Development Centre which was inaugurated for use by the local community during December 2018.

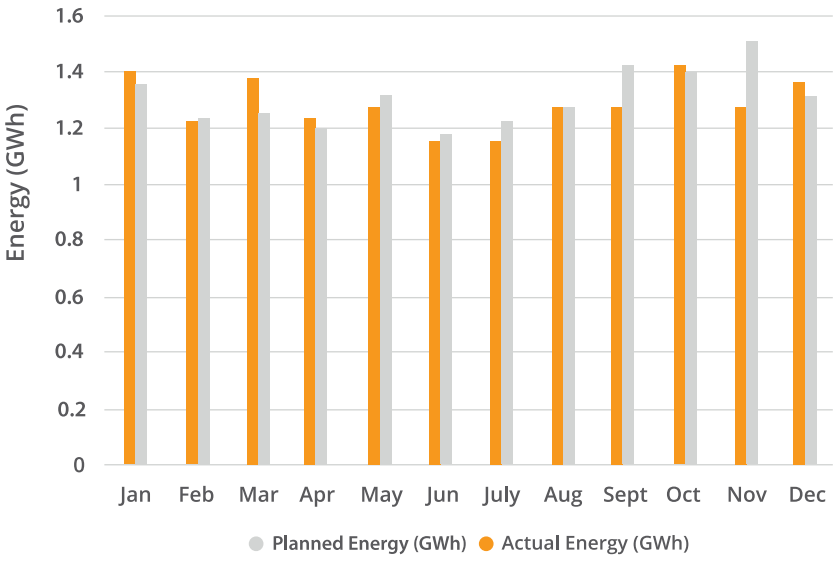


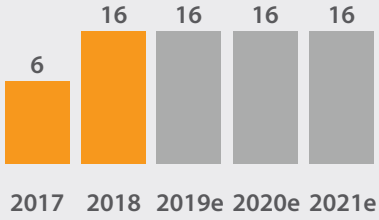
Figure 10 - Tororo Solar PV – Planned versus Actual Energy Output (2018)

Solar PV

Capacity (in MW)	10.0
Planned Generation (in GWh/year)	16.0
Total Investment (in USD)	19.6M
GET FiT Commitment (in USD)	8.0M

Annual Generation

(in GWh)



Soroti Solar PV

Operational

This Project is located east of the town of Soroti in the Soroti District, Eastern Uganda, and was commissioned in November 2016. The Soroti Solar Power Plant has 32,680 solar modules on 13 hectares, was developed by Access Uganda Solar Ltd., and has been injecting power to the national grid for more than two years. At the start of its commercial operation the 10 MW plant was the first grid-connected Solar Power Plant in Uganda and also East Africa's largest.

In 2018, the plant produced approximately 16.3 GWh. The deemed energy due to failures from the grid was 0.26 GWh, meaning that the plant should have produced circa 16.6 GWh in theory (no failures from the grid). The local Operation and Maintenance team (4 men and 1 woman) did not report any major events in this second year since achieving commercial operation, and was mostly following normal operating procedures, both preventive and corrective.

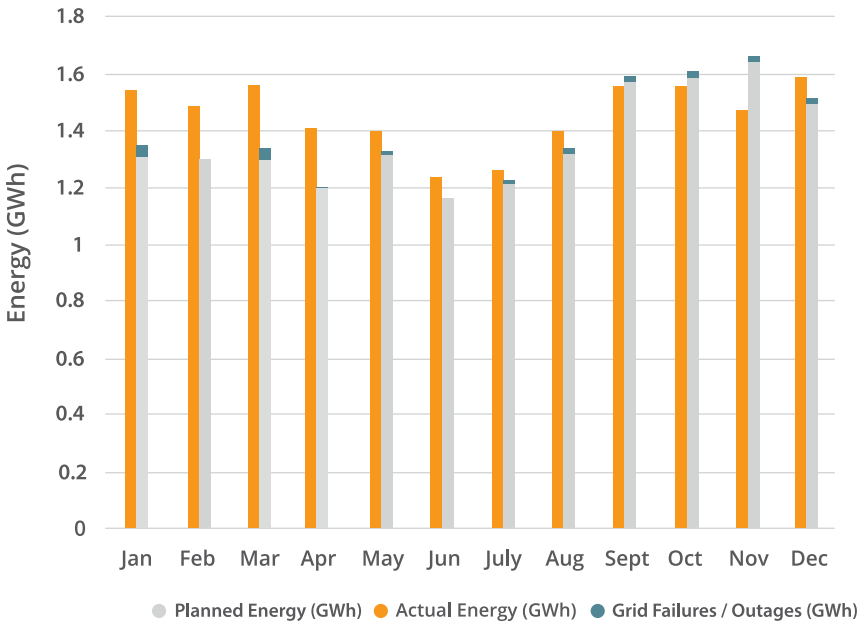


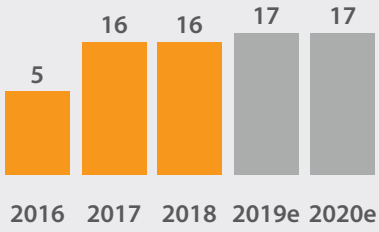
Figure 11 - Soroti Solar PV - Planned versus Actual Energy Output (2018)

Solar PV

Capacity (in MW)	10.0
Planned Generation (in GWh/year)	17.5
Total Investment (in USD)	14.3M
GET FiT Commitment (in USD)	9.6M

Annual Generation

(in GWh)



Kakira

Operational

The Kakira biomass (bagasse from sugar production) plant is located in the Jinja District, Eastern Uganda, and was the first operational project supported by GET FiT. Over the past three years the Project has been facing a reduced availability of sugar cane, caused mainly by increased local competition in the sugar cane market. To increase supply, the Developer acquired additional land for sugar cane production in 2017 and 2018. Accordingly, the output has seen a considerable increase: In 2017 the generation was at 44 GWh, while the plant generation nearly doubled to approximately 87 GWh in 2018.

The Kakira owners expect a continued increase in energy generation levels in the final years of GET FiT support (2019 and 2020), with a current estimate of up to 120 GWh/year in this period. Notably, in a 3 to 5 year perspective, the Project expects to achieve full production at 147 GWh/year. They aim to achieve this through additional land purchases which will increase their share of own cane supply from today's 35 percent, up to about 50 percent. Further to this, the Project is in the process of installing new irrigation systems for enhanced cane production on parts of the land.

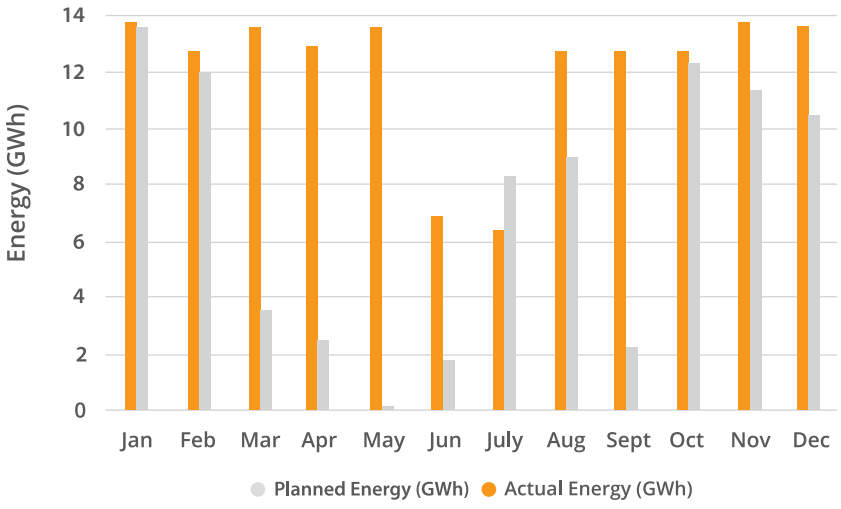


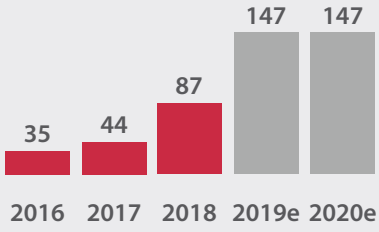
Figure 12 - Kakira Bagasse - Planned versus Actual Energy Output (2018)

Bagasse

Capacity (in MW)	20.0
Planned Generation (in GWh/year)	147.0
Total Investment (in USD)	56.8M
GET FiT Commitment (in USD)	7.1M

Annual Generation

(in GWh)



Waki SHP

Operational

This run-of-river hydropower plant is located in Hoima and Buliisa Districts in Western Uganda. The project commenced construction during 2015, and COD was achieved in December 2018.

Following an imposed construction stop during parts of 2017 as a result of slow progress and non-compliance with IFC Performance Standards and Ugandan regulations, the Developer made concerted efforts during 2018 to complete the works. Construction planning and monitoring were substantially improved as the year progressed and resources were more effectively managed to achieve target rates of construction in order to achieve commercial operation by the end of the year. This included managing critical activities and introducing redundancy in key construction plant and equipment, which had previously impacted progress following breakdowns.

The second stage river diversion was successfully completed by the middle of the year and was a major achievement for the Project, allowing weir construction to be completed, as was the tunnel breakthrough, through which the headrace pipeline was subsequently installed.

Hydro

Capacity (in MW)	4.8
Planned Generation (in GWh/year)	25.0
Total Investment (in USD)	17.3M
GET FiT Commitment (in USD)	3.6M

Siti 2 SHP

Under Construction

This run-of-river hydropower plant is located in Bukwo District in Eastern Uganda and commenced construction in August 2016. The Project has the largest installed capacity of the GET FiT projects and is the downstream part of the cascade with the already commissioned Siti 1 SHP, one of only two cascades in the portfolio.

The Project experienced a set-back during the year as a result of a landslide on the steep escarpment above the penstock. The penstock construction access road was blocked by the landslide and required planning and careful efforts to safely clear the loose boulders and other material and to secure safe working conditions for the remaining penstock installation works. Concerns were raised with respect to the longer-term stability of the escarpment and the robustness and resilience of key project structures against further landslides. Consequently, further design reviews were undertaken and important changes implemented, which also lead to further delays.

In the long term, power will be evacuated via a new 132 kV transmission line being planned between Mbale and Bulambuli, which is not expected to be completed before 2021. In the interim, a 140 km long 33 kV line is planned, although construction of this interim solution had not commenced by the end of 2018. With the remaining construction works expected to be completed during the first half of 2019, even the interim solution had become a critical activity for power evacuation and a deemed energy situation is likely. For the purpose of commissioning the plant, the Developer planned to construct a 4.7 km 33 kV line to connect the Siti 2 powerhouse with the powerhouse of the upstream Siti 1 hydropower project (also implemented by the Developer and supported by GET FiT, and already commissioned). Completion of the interconnecting line is expected by the end of January 2019, with commissioning planned during Q2.

Hydro

Capacity (in MW)	16.5
Planned Generation (in GWh/year)	72.0
Total Investment (in USD)	33.0M
GET FiT Commitment (in USD)	10.2M

Kyambura SHP

Under Construction

This run-of-river hydropower plant is located in the Rubirizi District in Western Uganda. During 2018, irresponsible construction practices along sections of the headrace canal resulted in substantial, adverse environmental and social impacts. Consequently, a financial penalty was applied in the form of a subsidy reduction and the Project was threatened with further financial penalties if construction practices did not improve. Regrettably, the environmental damage arising from poor practices created a barrier to upstream fish migration. The threat of further subsidy reductions persists into Q1 2019.

The potential to cause further adverse environmental and social impacts also led to a partial construction stop being imposed, with the developer requested to reconsider the design and construction approach in two key locations where the blasting and excavation of substantial volumes of rock were planned. As a result, the dam and intake structure were relocated approximately 0.5 km downstream from the originally planned location, which resulted in an increased dam height and reservoir footprint and a corresponding reduction in canal length, as well as the introduction of a substantial canal aqueduct section. As a consequence, the Project was further delayed and the construction of the dam is now critical to the Project achieving commercial operation, which is currently planned during Q2 2019. The construction of all other project structures had otherwise progressed well during the year.

Hydro

Capacity (in MW)	7.6
Planned Generation (in GWh/year)	36.7
Total Investment (in USD)	24.0M
GET FiT Commitment (in USD)	5.4M

Sindila SHP
Under Construction

This run-of-river hydropower plant is located in Bundibugyo District in Western Uganda. At the end of 2017 and in early 2018, the Contractor's headrace pipeline installation methodology resulted in substantial adverse environmental and social damage and the Project was requested to temporarily stop construction. The Developer and EPC Contractor subsequently made concerted and commendable efforts to review and revise the design and construction approach, which resulted in substantially reduced environmental and social impacts.

Changes included realigning the headrace waterway and adopting an alternative pipeline installation methodology, leading to a much-reduced construction footprint. An access track, rather than road, was constructed to the weir, and construction materials and small equipment were manually transported to the weir site with larger materials and small plant transported via a cableway.

The delays experienced due to the earlier construction methodology, combined with the time taken to re-think and adopt an alternative construction approach, substantially impacted construction progress. Nonetheless, by the end of 2018, construction works had progressed well, and commercial operation was planned early during Q1 2019. A new 5 km power evacuation line has been constructed to connect the powerhouse to the existing grid, and further delays to its implementation may threaten the timely commissioning of the Project. The existing grid was expected to be sufficient to evacuate the full output of the Sindila SHP subject to modifications to convert it from a distribution only to evacuation line, which was also planned as a priority.

Hydro

Capacity (in MW)	5.3
Planned Generation (in GWh/year)	27.0
Total Investment (in USD)	19.4M
GET FiT Commitment (in USD)	3.9M

Ndugutu SHP

Under Construction

This run-of-river hydropower plant is located in the Bundibugyo District in Western Uganda. The EPC Contractor is common to both the Sindila and Ndugutu SHP's, and the design and construction issues encountered at the Sindila SHP were similarly experienced at Ndugutu SHP during 2018. The construction methodology for delivering and installing the penstock pipeline led to multiple slope failures, slow construction progress, and substantial environmental and social damage during the latter part of 2017 and early 2018. Consequently, a financial penalty was applied in the form of a subsidy reduction and the Project was threatened with further financial penalties if construction practices did not improve. The threat of further subsidy reductions persists into Q1 2019 due to the continued substantial risks of environmental and social damage. Following a request to partially stop construction, the design and construction methodology was substantially modified and included a shift towards adopting more manual construction techniques as well as cableway systems.

As for Sindila SHP, delays experienced due to the earlier construction methodology, combined with the duration required to rethink and adopt an alternative construction approach, substantially impacted construction progress. By the end of 2018, a considerable amount of construction works was still remaining, particularly along the headrace waterway and at the weir, and commercial operation was planned to commence in Q2 2019.

The Ndugutu and Sindila hydropower projects will initially connect to an existing power evacuation line that will not be sufficient to evacuate the full capacity of both projects. The construction of the new 100 km of 33 kV power evacuation line, which is the permanent evacuation solution for both projects, is currently planned for completion in Q3 2019 and will therefore need to be expedited to avoid deemed energy claims.

Hydro

Capacity (in MW)	5.9
Planned Generation (in GWh/year)	26.5
Total Investment (in USD)	17.1M
GET FiT Commitment (in USD)	3.2M

Nyamagasani 1 SHP

Under Construction

This run-of-river hydropower plant is located in the Kasese District in Western Uganda. The Project finally achieved financial close and issued the EPC Contractor with a Full Notice to Proceed at the end of 2017.

The first few hundred metres of headrace waterway from the weir is located in particularly challenging terrain with unfavourable geological conditions and there were substantial risks of environmental damage during construction of the access road. A staged process was therefore enforced whereby the Developer was required to submit evidence of having constructed measures to minimise the risk of environmental damage in order to achieve a 'no-objection' from GET FiT to proceed with excavation works.

By the end of 2018, construction of the weir access road had still not been completed and designs of the upper headrace structures were still to be finalised. A substantial amount of construction works remained and several activities were critical to achieving the planned commercial operation date including construction of the weir and the upper headrace, installing the nearly 5.0 km long steel penstock which only commenced during Q4 2018, as well as construction of the powerhouse.

Given the continued delays with procurement of critical materials and equipment and the generally poor progress observed during 2018, the Developer's planned commercial operation date in Q2 2019 appeared highly unlikely, with Q3-Q4 2019 being more realistic.

Construction of the new 55 km 33 kV evacuation line, being implemented by the Rural Electrification Agency, also remained a critical risk to the Project with construction expected to commence in Q1 2019. Further delays in implementing the infrastructure will substantially increase the risk of deemed energy for the Nyamagasani 1 and 2 hydropower projects.

Hydro

Capacity (in MW)	15.0
Planned Generation (in GWh/year)	64.0
Total Investment (in USD)	36.1M
GET FiT Commitment (in USD)	9.3M

Nyamagasani 2 SHP

Under Construction

This run-of-river hydropower plant is located in the Kasese District just downstream of the Nyamagasani 1 SHP in Western Uganda. The Developer and EPC Contractor are common to both the Nyamagasani 1 and 2 SHP's – the second cascade of schemes in the portfolio. Similar to the Nyamagasani 1 SHP, progress observed during 2018 was generally poor and the procurement of critical materials and equipment had been delayed. A substantial amount of construction works remained. COD was estimated to occur in Q2 2019.

The Project was also requested to partially stop construction of the headrace canal during 2018 due to the potential for significant environmental and social damage as well as health and safety risks with the originally proposed design and construction approach. Designs through this steep and challenging section of terrain were reviewed and important changes implemented, which also lead to further delays. By the end of the year, design issues had otherwise been largely resolved, with the exception of the fish pass arrangement at the weir; construction of the weir, headrace canal, and forebay was reasonably well advanced. Construction of the powerhouse and installation of the penstock and electromechanical equipment had not, however, commenced, and were critical to achieving the planned commercial operation date. The new 33 kV evacuation line is common to both Nyamagasani projects, and its implementation is therefore also a critical risk to the Nyamagasani 2 hydropower project.

Hydro

Capacity (in MW)	5.0
Planned Generation (in GWh/year)	25.5
Total Investment (in USD)	19.4M
GET FiT Commitment (in USD)	3.7M

Kikagati SHP

Under Construction

This run-of-river hydropower plant is located in Isingiro District in Southern Uganda on the border with Tanzania. At appraisal stage, the Project had a planned installed capacity of 16 MW and was expected to deliver 115 GWh of output annually. At the end of 2018, the Developer advised that the name plate on the plant would instead be 14 MW, but that updated energy modelling indicated an expected two percent increase in power output annually. Until potential implications of the design change for the GET FiT Programme have been clarified and the design change materialises, the Project will continue to be reported at 16 MW.

Having resolved the transboundary issues in executing a bilateral agreement between the Governments of Uganda and Tanzania in 2017, the Project experienced a further major setback in Q1 2018. The EPC Contractor, which had initially mobilised to site during Q4 2017 and commenced site establishment, was subsequently replaced early during Q2 2018 for commercial and performance reasons. A split EPC contract was adopted instead, with the replacement EPC Civil Contractor being awarded a Limited Notice to Proceed during Q2 and the original electromechanical subcontractor being awarded a Notice to Proceed as the EPC Electromechanical Contractor, also during Q2.

To minimise delays to the Project during replacement of the EPC Contractor, the Developer continued with construction of the camp facilities. The replacement EPC Civil Contractor subsequently mobilised to site during Q3, undertook further ground investigation works and design reviews, and largely completed mobilisation to site. The powerhouse and intake were relocated further inland as a result of the design review, and excavation of the powerhouse foundations were well underway by the end of the year. Design modifications to the dam arrangement, spillway gates and fish pass were also being considered.

Despite the delays, the revised commercial operation date for the Project had been brought forward to early Q3 2019, approximately two months earlier than the programme of the previous EPC Contractor.

Hydro

Capacity (in MW)	16.0
Planned Generation (in GWh/year)	115.0
Total Investment (in USD)	86.0M
GET FiT Commitment (in USD)	12.3M

03 Environmental and Social Performance

3.1 Environmental and Social Benchmark

Sound management of environmental and social (E&S) risks protects the environment and safeguards project-affected people and workers. Sound risk management also secures a social licence to operate for a project developer, a broad social acceptance within the project communities and among other stakeholders. This acceptance guards against a variety of social risks during construction and operation and saves costs in the long run.

Projects supported by GET FiT are required to comply with Ugandan regulations and international standards, particularly the environmental and social performance standards (PS) of the International Finance Corporation (IFC). The IFC PS act as a global benchmark and are widely applied by international financing institutions and private investors, also making these a convenient common reference point in multi-donor funded initiatives like GET FiT. Unfortunately, several international lenders and owners did not ensure full compliance with international E&S standards, thereby increasing the supervision efforts by GET FiT. It is important to note that the Ugandan regulations and the IFC PS have many similarities, though there are also some important differences. For example, the IFC PS require that compensation for loss of assets during displacement is based on full replacement cost (market value + transaction costs) rather than Uganda's requirement of using the lower depreciated value. The IFC PS also require biodiversity offsets when a project impacts a protected area such as a national park. The current Ugandan legislation does not require such offsets but proposals for inclusion of offsets in new Ugandan legislation have been made.

3.2 GET FiT Follow-Up and Support

As highlighted in previous GET FiT Annual Reports, the capacity of developers and their consultants to manage environmental and social risks, including health and safety, has been considerably lower than expected. Weak capacity was reflected in the low E&S scores during appraisals of applications for GET FiT support, also resulting in numerous conditions precedent (CPs) defined by the Investment Committee. An anonymous survey among developers in 2015 confirmed that few of the developers had pre-GET FiT experience from implementing projects in line with the IFC Performance Standards.

The GET FiT Investment Committee defined more than 50 environmental and social CPs across the three RfPs in 2013, 2014 and 2015. The CPs were concerned with revision of environmental and social impact assessments (ESIAs), resettlement action plan (RAPs), environmental and social management or action plans (ESMPs or ESAPs) and livelihood restoration plans (LRPs). Five (5) E&S CPs were cleared in 2018. Cumulatively across the portfolio to date, 80 % of the environmental and social CPs have been cleared.

As in previous years, GET FiT spent considerable time reviewing and advising developers on E&S issues in 2018. Labour and working conditions including health and safety on construction sites, managing additional land acquisition during construction and ensuring fair compensation, pollution and hazardous waste management, and management of indirect impacts on important biodiversity in national park areas have been important issues in 2018. As more projects achieved commercial operation there was need for additional work on operation phase plans and management of operation phase impacts such as reduced availability of water along river sections where the hydropower projects divert most of the water for much of the year. In 2018, developers continued to express a demand for GET FiT engagement on the management of environmental and social risks. Additional resources earlier provided by KfW and cooperation with ERA continued to support this follow-up.

A total of 29 project visits to twelve (12) projects were undertaken in 2018 including 24 project supervision visits, four (4) COD visits, and one (1) post-COD visit. All visits were to small hydropower projects. Action points were identified in each visit, and the visits continued to prove useful and a necessary part of managing environmental and social risks. In addition, the supervision team made multiple brief unannounced visits at GET FiT projects in operation during the rounds of scheduled visits. The GET FiT Implementation Consultant normally undertakes a semi-annual one-day supervision visit to each project under construction. In 2018, seven projects received additional visits due to the multiple challenges faced by the projects that have not yet achieved commissioning. For several projects, GET FiT also shared information and coordinated feedback to developers with lenders.

3.3 Improvements and Remaining Challenges

Most projects under construction in 2018 saw improvements in environmental and social performance. Projects subject to additional visits or being notified about potential subsidy reductions responded more decisively and rapidly to requests for improved environmental and social performance and the need for closing long-standing gaps. As a result of the Programme, there is now a considerably higher degree of compliance with Ugandan regulations and international standards than would otherwise have been observed. Several developers have made impressive improvements in their capacity to manage environmental and social risks, their internal management systems, and undertook measures to safeguard people and nature during project construction in 2018.

Most developers had, prior to GET FiT, not gone through the full project cycle from project development to operation following international E&S standards. This meant new challenges kept arising as the projects moved into the next stage of the project cycle including commissioning and operation, which necessitated further GET FiT follow-up. Damage to the surrounding natural vegetation and rivers as well as to local people's properties due to poor construction practices (e.g. excavation), delays in compensation payments triggered by construction damage, and workers' health and safety risks, remained challenges in 2018 and will require further follow-up in 2019 to close outstanding issues prior to commissioning. Substantial compensation to local people for damage has been triggered. Damage also led to legal proceedings against developers and contractors, some of which were settled during 2018. Developers' monitoring of E&S issues during construction remained a weakness in most projects, and resource-constrained Ugandan government lead agencies were not able to completely fulfil their intended roles in monitoring compliance. Participation in GET FiT supervision visits contributed to ERA's follow-up of projects and efforts to ensure construction in compliance with key Ugandan regulations.

Emerging challenges included the transition from the construction phase team to the operation phase team, ensuring adequate hand-over and institutionalising local knowledge and understanding of sensitive issues. Several projects retained an environmental and social officer from the construction phase, and this person plays an important role in community liaison as operation phase issues arise, for instance grievances related to reduced river flow between the intake and power station. Releasing and monitoring the environmental (minimum) flow came up as a challenge for projects in operation, and there were indications that some projects did not release water in accordance with the requirements set by the Ugandan Government. GET FiT works with ERA to address these non-compliances and develop guidance for future follow-up of environmental flow releases.

GET FiT sees environmental and social sustainability as key to overall project sustainability. Where a forceful response to persistent non-compliance is required, GET FiT has several tools available, including increasing the frequency of supervision visits at the cost of the developer, unannounced site visits, construction stops, subsidy reduction, and even revoking the subsidy in extreme cases.

One approved project had its support revoked by the GET FiT Steering Committee in 2015 due to consistent serious environmental and social non-compliances. In 2016, two projects were requested to suspend construction until corrective measures were implemented, one project was requested to do the same in 2017, and five projects had stops in specific construction works in 2018 but not across the entire project site. All projects resumed construction following substantial improvements. While only one project was subject to quarterly supervision visits in 2016, five projects were covered by quarterly visits in 2017, and seven projects in 2018. Additional visits were triggered due to E&S non-compliances and partly also due to limited construction progress and limited on-site project management capacity. Two projects experienced subsidy reductions due to serious non-compliances that were not adequately addressed during the cure period. Some projects still had substantial non-compliances at the end of 2018 and may face actions by GET FiT in 2019 unless urgent corrective measures are implemented.

04 Grid Connection Status and Challenges

4.1 Operational Projects

Four projects achieved connection and synchronisation to the Ugandan national grid in 2018, bringing the total of operational GET FiT projects up to ten (10). Unfortunately, some of these projects continue to experience challenges of inadequate and unreliable power evacuation due to technical issues on the grid, which has already led to substantial deemed energy claims from these projects to GoU. Remaining issues need to be rectified in order to reduce such claims and increase power supply.

Figure 12 shows the planned, actual and deemed energy outputs of the GET FiT portfolio projects in 2018 (left axis). It also shows the percentage of deemed energy relative to total potential generation (right axis). As seen in the figure, four projects experience deemed energy levels at more than 10 percent of potential generation, with two projects Nkusi and Siti 1, at more than 25 percent.

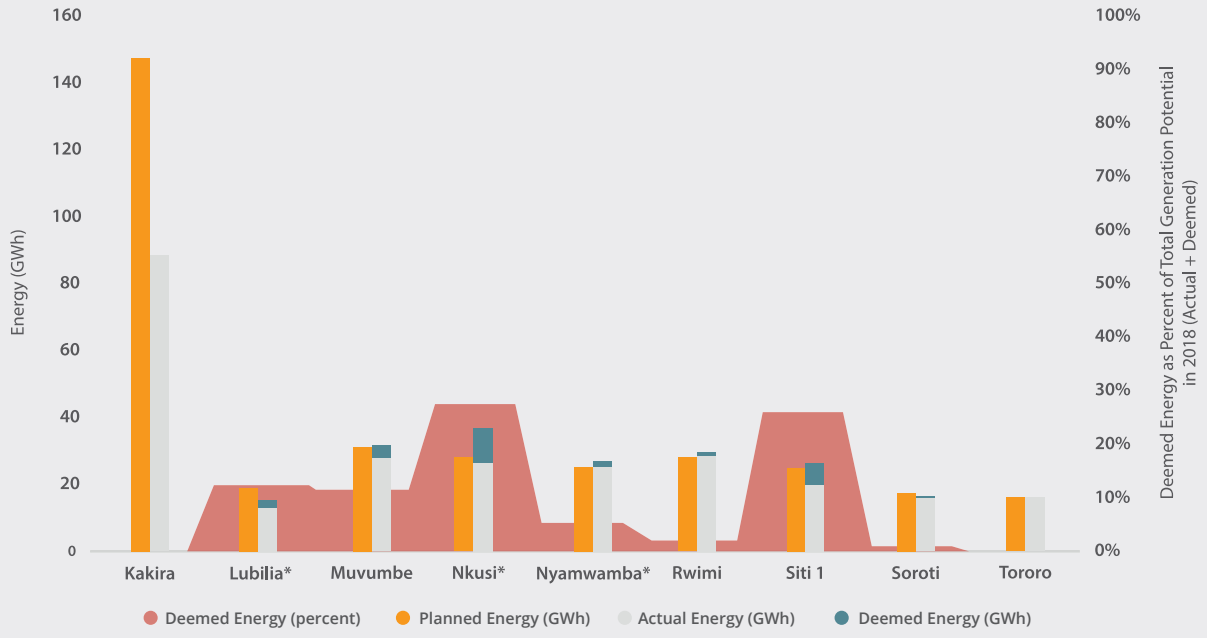


Figure 13 **-** Planned, Annual and Deemed Energy Generation from GET FiT Projects in 2018.

**Nkusi, Nyamwamba and Lubilia commissioned during the year and their planned generation is shown for operational months only. Waki commissioned in late 2018 and is not included.*

As seen in Figure 13, there is a wide variation in the reliability of power evacuation among commissioned projects. Concerted efforts are needed to strengthen the national grid in order to maximise the benefits of GET FiT distributed generation. The evacuation challenges and interventions experienced by selected projects commissioned in 2018 are highlighted below.

Nkusi SHP

Nkusi SHP experienced the biggest challenges of evacuation during 2018. Following the project's commissioning in June 2018, the project was initially only able to evacuate 45 % of its capacity. This was mainly due to constraints in the existing grid's protection scheme and an inadequate network configuration that was suited to power distribution rather than power evacuation.

Additional interventions by various GoU agencies and the developer have since enabled the full evacuation of the project. The full evacuation was facilitated by joint efforts from the developer, UEDCL and Umeme, with oversight from ERA. The key interventions included the reconnection of a 1.5 km line stretch along the Kyenjojo – Kagadi 33 kV line that had been disconnected due to unresolved wayleave issues. The developer covered the wayleaves compensation and the line was reinstated by UEDCL. The rest of the interventions involved the reconfiguration of the grid's protection scheme for power evacuation through installation of new protection devices and replacement of broken or weak poles, among others.

However, a new challenge arose when the distribution network operator in the project area, UEDCL, reported a significant increase in energy losses resulting from the evacuation of Nkusi. The losses were aggravated by the very long 33 kV lines through which the project is evacuated to the nearest UETCL substation in Fort Portal. Additionally, there is limited electrical load in the project area, hence the need to wheel energy through the long medium voltage lines. The high losses resulted in a temporary cap on the project's energy generation by UEDCL. The developer is implementing measures to reduce technical losses, including the construction of new distribution lines to create alternative routes of evacuation for increased loading and network reliability.

The Government is also planning to implement measures to optimise the evacuation of Nkusi and other pipeline projects in mid-western Uganda. The key intervention involves expediting the construction of the Muzizi B high voltage substation close to the project area to enable the projects to be evacuated through the recently commissioned Nkenda – Fort Portal – Hoima UETCL high voltage transmission line. Designs for the planned 40 MVA substation are ongoing with coordination between UETCL, REA and the Sector Planning and Coordination Committee (SPCC).

Waki SHP

Unlike many other projects, the evacuation line for Waki was built and in place long before the project was commissioned. However, the project experienced several bottlenecks in achieving full evacuation during grid synchronization tests. The challenges were mainly related to the existing line's fault protection and general maintenance. As a result, the line was initially only able to evacuate 20% of its capacity before tripping during tests in November 2018.

The network operator, UEDCL, implemented several interventions that included general line maintenance (vegetation clearance, pole replacements) and reconfiguration of the protection scheme, i.e. installation of jumpers, drop out fuses and auto reclosers at strategic locations along the evacuation line. The timely interventions by UEDCL and GoU enabled the project to achieve close to 80% evacuation by the time it achieved COD on 3rd December 2018. However, numerous grid failures persist and options are being explored to stabilize the network. The ultimate solution is considered to be the construction of a double circuit 33kV line through Biiso-Kigorobya to the new UETCL 132/33kV transmission substation at Bulemwa near Hoima. The developer has commissioned a study on this implementation.

4.2 Projects Under Construction

For the seven projects that are still under construction, major grid reinforcements are still required and behind schedule. The current status and deemed energy risk levels associated with these projects are summarised in Table 2 with further elaboration below for selected projects.

No.	Project	Capacity (MW)	Expected COD	Status*	Deemed Energy Risk
1	Kyambura	7.6	Q2-Q3 2019	On track. Line to be built by developer.	low
2	Kikagati	16.0	Q2 2020	Completed. Line built by REA.	low
3	Sindila	5.3	Q1 2019	Line completed by ERA but not energized due to pending RAP issues.	medium
4	Siti 2	16.5	Q2 2019	Severely delayed. Line to be expedited by Umeme.	high
5	Nyamagasani 1	16.0	Q3-Q4 2019	Delayed. Line to be expedited by REA. May also face deep interconnection issues at Nkenda substation.	high
6	Nyamagasani 2	5.0	Q2-Q3 2019	Delayed. Line to be expedited by REA. May also face deep interconnection issues at Nkenda substation.	high
7	Ndugutu	5.9	Q2 2019	Delayed. Line to be expedited by REA.	high

*Status as of 18.03.2019

Table 2 - Status of Interconnection of GET FiT Projects Still Under Construction

Siti 2 SHP

The 16.5 **MW Siti 2 SHP** in Bukwo district, Eastern Uganda is expected to commission in Q2 2019. The timely evacuation of the project is highly uncertain. The required grid reinforcements involve the construction of approximately 175 km of 33 kV evacuation lines to Umeme's Mbale substation, as well as upgrades to the substation. ERA gave authorisation to Umeme to construct the line in January 2018. As of January 2019, Umeme was in the process of procuring multiple contractors to expedite the construction. The procurement of EPC contractors is expected to be concluded at the end of Q1 2019, with a planned construction period of four months thereafter. There is thus a high risk of deemed commissioning for Siti 2. KfW and the GET FiT Secretariat continue to engage with all stakeholders towards expediting the line's implementation.

Sindila and Ndugutu SHPs

The 5.3 MW **Sindila SHP** in Bundibugyo was declared ready for synchronisation to the national grid in February 2019. There were initial delays to the construction of the 4.8 km 33 kV line from the project's switchyard to the existing grid at Bubandi for evacuation towards Fort Portal. This line will also evacuate the 5.9 MW **Ndugutu SHP** after wider grid reinforcements are implemented.

Following concerted efforts by GoU through MEMD, REA ERA and UETCL, with support from GET FiT, the line was built and ready by February 2019. As Sindila starts grid synchronisation tests, it is expected that additional reconfigurations to line protection and maintenance may be required to minimise outages and ensure full evacuation. Grid synchronisation tests for Sindila had not been done as of mid-February 2019.

The 5.9MW Ndugutu SHP is expected to achieve COD in Q2 2019. The timely construction by REA of the new 104 km 33 kV line from Bubandi to Fort Portal with funding from the UK Department for International Development (DFID) through GET FiT will be critical for the evacuation of both Ndugutu and Sindila SHPs. The line construction is expected to be completed in Q3 2019. Therefore, a high risk of deemed commissioning remains for Ndugutu SHP. The GET FiT Secretariat will continue to actively engage with GoU, the Supervision Consultant and Contractors to ensure that the implementation of the line is expedited.

Nyamagasani 1 and 2 SHPs

Construction of a joint 55 km 33 kV line to evacuate power from both **Nyamagasani 1 SHP** and **Nyamagasani 2 SHP** is being implemented by REA which has procured an EPC contractor. Construction of the line is expected to commence in Q1 2019 and be completed in Q3 2019.

With Nyamagasani 2 (5 MW) currently expected to be commissioned in Q2, there is a high risk of deemed commissioning. The implementation of the evacuation lines for Nyamagasani 1 and 2 is part of the wider interventions through GET FiT, and the Secretariat will continue engagements to expedite the reinforcements.

4.3 Grid Reinforcements

A number of projects still present a high risk of deemed energy obligations to GoU if critical grid reinforcements are not implemented in time for the planned project commissioning. Multiple interventions are ongoing, which are presented in the following two sections. An overview of key ongoing grid investments that are funded by GET FiT, or relevant to the GET FiT portfolio, is provided in Figure 14.

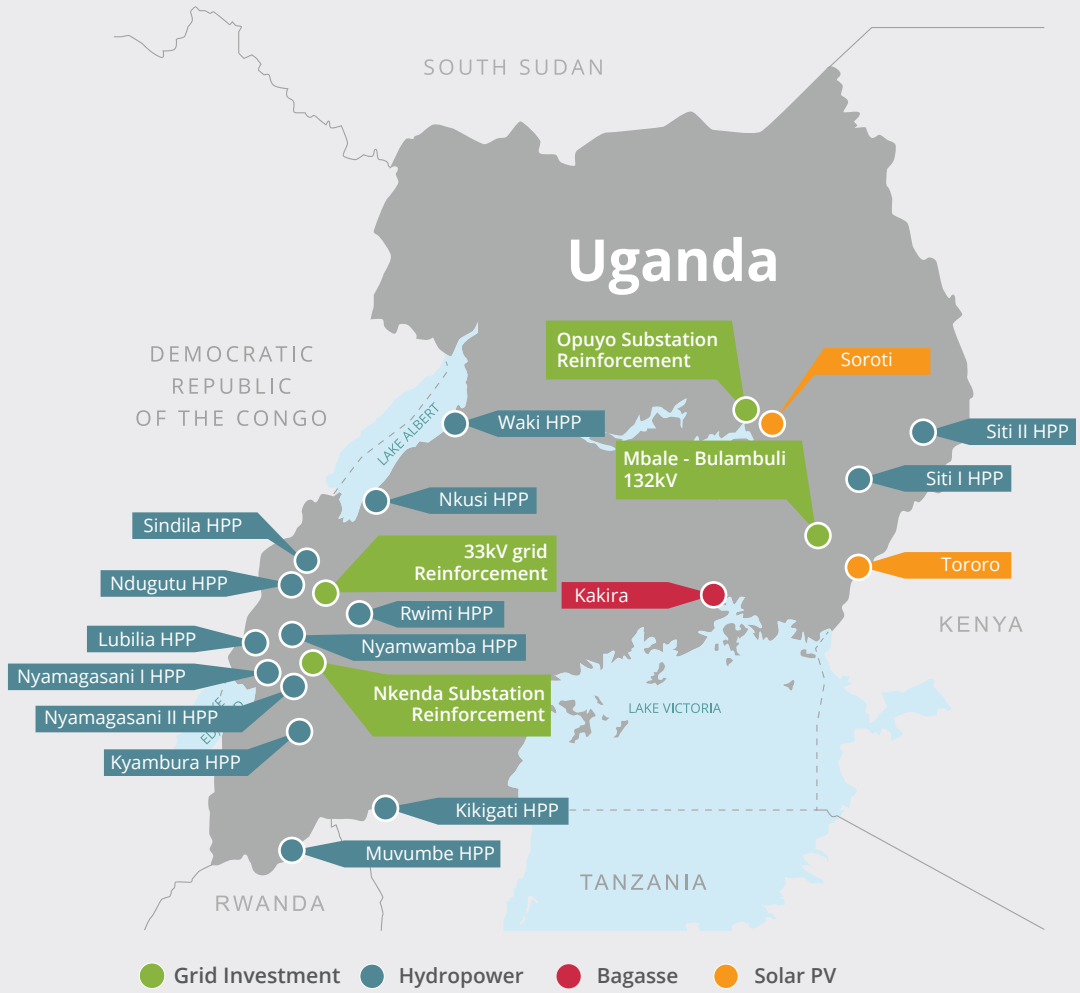


Figure 14 - GET FiT Uganda Project Map with Grid Investment in Green Boxes

4.3.1 GET FiT Interventions

Three grid-related interventions are funded through the GET FiT Programme, namely a reinforcement of 33kV networks in Western Uganda, an upgrade of the Opuyo substation, and Technical Assistance to ERA. An overview of the elements and associated costs is provided below. The elements are further detailed in the following sections.

Item	Required Intervention	Project owner	Estimated cost (MUSD)
1	Reinforcement of 33 kV networks in Western Uganda	UEDCL	13.7
2	Opuyo Substation upgrade	UETCL	3.6
3	TA support to ERA	ERA	3.9
Total grid interconnection support			21.2

Table 3 - Funding Commitments for Interconnection Support through GET FiT

Reinforcements of 33 kV networks in Westerns Uganda

The Programme secured support from DFID to construct new 33 kV distribution lines in the West of the country for the power evacuation of four projects. The implementing agency is REA which has procured two EPC contractors to construct the lines in two lots, namely; Lot A involving the construction of 104 km of new 33 kV lines for the evacuation of Sindila and Ndugutu SHPs in Bundibugyo, and Lot B involving 120 km of new 33 kV lines for evacuation of Lubilia (5.4 MW), Nyamagasani 1 and 2 in Kasese district. The initiative will ensure evacuation of approximately 37 MW of new generation to the national grid.

The Works include the design, supply, construction, testing and completion of the two Lots and are expected to be completed in August 2019, as per the original EPC contracts. The contractors for both Lots have completed topographical surveys of the line routes, submitted line designs subject to approval by the Supervision Consultant, and initiated equipment procurements and started construction as of Q1 2019.

A critical aspect for the implementation of both lines will be the timely compensation by REA of Project Affected Persons (PAPs) in both Lots prior to the start of construction. REA completed the Resettlement Action Plan (RAP) studies in 2018 and has secured funds for compensation from GoU. However, detailed designs by the EPC contractors resulted in changes in the original line routes, requiring additional RAP studies. It will be important to manage any social issues and coordinate the compensation process effectively to avoid extended delays.

Opuyo Substation Upgrade

The objective of this interconnection component is to install 2x40 MVA 132/33 kV transformers at the Opuyo substation which will facilitate adequate capacity and improved reliability and security for the evacuation of existing and planned solar generation power plants near the Opuyo area. The Soroti solar PV plant is evacuated through Opuyo substation. The current transformer capacity is a single 10/14 MVA 132/33 kV transformer which presents a reliability risk in case of outage.

Regarding implementation, the contracts for the Supervision Consultant and EPC contractor became effective in May 2018. The implementation schedule according to the contracts is 16 months; hence contractual completion is expected in September 2019. The contractor has finalised the substation electrical and civil works designs and started mobilisation for the actual construction in Q4 2018.

Technical Assistance to ERA

In addition to infrastructure reinforcements, the grid connection support component included a budget for technical assistance to ERA through the GET FiT TA Facility. Although funded as part of the grid support initiative, these TA components were not restricted to grid related issues, but also introduce wider strengthening of ERAs regulatory systems. As outlined below, one component was finalised in 2018, with one still remaining for completion in 2019. Notably, several other TA components have been conducted under the GET FiT TA Facility in earlier years. Please refer to earlier GET FiT reports **(www.getfit-reports.com)** for more details.

Optimisation of Compliance Monitoring of Distribution and Transmission Licensees.

The main objective of this TA was to equip ERA staff with the procedural, technical, economic and environmental competence to perform its mandate as regulator of the transmission and distribution sub-sector in line with international best practice. The expected outcome was the establishment of licensing and performance monitoring processes for all present and future transmission and distribution licensees. The assignment was implemented by Azorom and completed in 2018.

Regulatory Information Management System (RIMS)

ERA has committed to invest in the use of information technology to improve efficiency in the execution of its various mandates. The main objective of this assignment was to support ERA in the successful implementation of a Regulatory Information Management System (RIMS) to enhance its information collection and data processing, automate regulatory analysis and compliance monitoring, as well as automate interactions with its stakeholders. The contract for the system design and preparation of tender documents was awarded and the project was started in May 2018. The entire assignment duration is estimated to be 13 months. The Consultant is currently finalising the design and solution report and the procurement of the contractor to implement the system has been initiated by ERA.

4.3.2 Wider Sector Interventions

Two sector-wide interventions for grid reinforcements will directly impact the evacuation of power generated by GET FiT projects, namely the upgrade of the Nkenda substation and the implementation of the Mbale-Bulambuli 132 kV transmissions line.

Nkenda Substation

Three GET FiT projects currently under construction (Nyamagasani I & II and Kyambura) with a combined capacity of 28.6 MW will be evacuated through UETCL's Nkenda substation after their commissioning in 2019. The current transformer capacity of Nkenda substation is 40 MVA. According to UETCL data, the average maximum loading of the two transformers at Nkenda in September 2018 was 99 %. It is clear that the substation's capacity will be highly inadequate to evacuate the three new projects in addition to other pipeline projects planned in the Kasese area during 2019. This presents a high risk of deemed energy obligations for the Government.

The Government through UETCL is currently urgently considering interim measures to upgrade the power handling capacity of Nkenda substation. The options include the movement of redundant high voltage transformers from other parts of the network to Nkenda, or the deployment of mobile transformers, if available.

Mbale - Bulambuli Transmission Line

The planned 79 km Mbale-Bulambuli transmission line is expected to evacuate Siti 1 and 2 SHPs, eliminate transmission bottlenecks in Eastern Uganda and enhance system reliability, availability, and quality of power supply. The scope includes the construction of Bulambuli (Atari)—Mbale 132kV transmission line, 132/33kV substations at Bulambuli (Atari) and Mbale, and rural electrification along the 132kV line. The feasibility study including ESIA scoping of the line has been completed, with funding from the EU ITF through KfW. Financing for the line's construction has been offered by the German government and financial close is expected in 2019. The line is not expected to be completed before 2021, hence a new 33 kV line is needed to evacuate Siti 2 in the interim until then.

05 Academic Corner

For most countries in Sub-Saharan Africa (SSA) unreliable and insufficient power-supply poses a substantial challenge to poverty alleviation and economic development. In the region almost half of the population does not have access to electricity and continuous power outages hamper the economic performance of those already connected to the grid. For instance, Ugandan firms reported in the last World Bank Enterprise Survey (2013) that they lose on average 11.2% p.a. of sales due to outages and identified these to be their main obstacle in their business environment (see Figure 15). At the same time, only 22% of Ugandans have access to on-grid electricity at all and until recently there was a shortage of electricity generation.

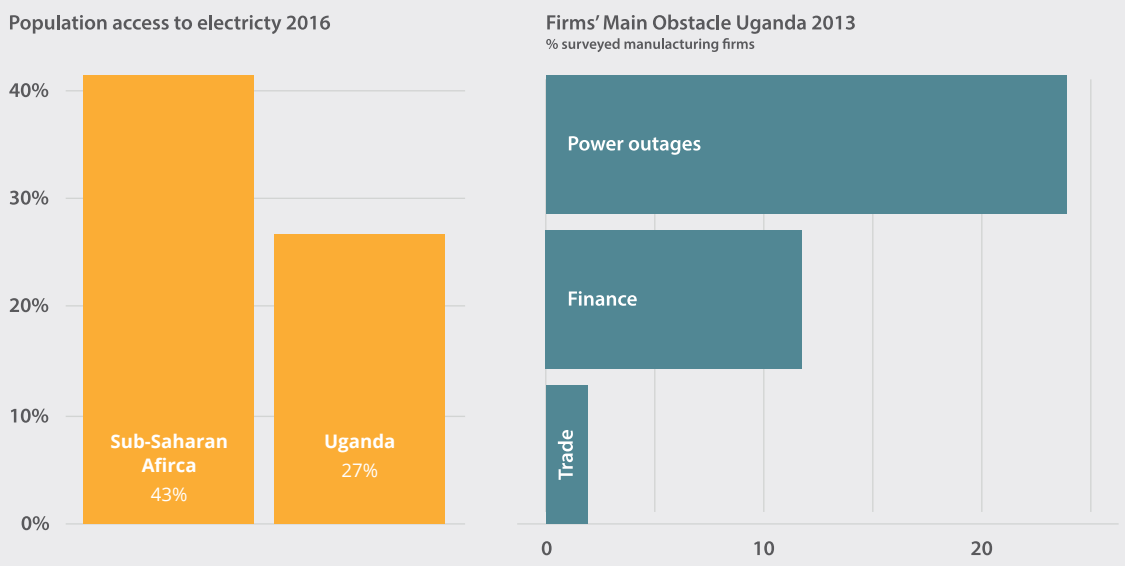


Figure 15 - Population Access to Electricity (including off-grid) and Firms' Main Obstacle in Uganda 2013

Enabling improved quality and security of grid electricity supply in Uganda requires significant investments in renewable power generation. Uganda and other East African countries are currently experiencing a reduced ability to obtain concessional finance due to overall high levels of public debt. Hence, the funding gap in the electricity supply industry, including power generation, cannot be filled by the public sector alone but requires increasing participation of the private sector (e.g., through independent power producers). However, private investments in electricity generation will not materialise without a suitable investment environment. Such an environment is characterised by a clear, credible and tested regulatory framework for private sector participation, including a standardised Power Purchase Agreements (PPA) that mitigates off-taker risks. It also requires high level political backing through sufficiently credible and transparent long-term policy and investment plans for power sector development. Political commitment towards cost-reflective electricity tariffs is also required. In the early stages of private sector participation, where the regulatory framework has not yet been sufficiently tested, a case can be made for financial incentives to mobilise the first

private investment and kick-start participation in a new segment. In order to get developers and sponsors off the fence, GET FiT Uganda introduced a top-up tariff to provide keen developers with a more attractive return on renewable IPP investments.

Hence, the question is to what extent the GET FiT Programme incentivised private investments that would not have happened otherwise.Given that Randomised Controlled Trials (RCTs) are normally not possible for infrastructure projects, such as GET FiT, we use a threshold approach to evaluate the additionality of the GET FiT Programme.

We also model the profitability of projects, namely the Internal Rate of Return (IRR). Firms that applied to build GET FiT plants needed to provide extensive financial documentation, which was checked by the Programme Management. The quality of this documentation is above that of most other comparable programmes. In addition, instead of using the same metric of financial viability across different rounds (e.g., 11% IRR), we use the lowest IRR in each round of projects that were rejected, but then went ahead with construction despite not receiving funding by the GET FiT Programme. This IRR is referred to as the counterfactual IRR, and provides an indicative level for the actual (non-subsidized) market IRR. Out of the 17 projects, 14 were small hydropower plants, so we focus only on this subset of plants.

Our preliminary findings, as illustrated in Figure 16, suggest that most small hydropower plant projects were additional i.e., would not have been built without the GET FiT project support, particularly in funding round 1 and 2. It is evident from the data, that the profitability of projects required to go ahead with construction (counterfactual IRR) declined substantially in round 3, indicating lower investment risks. This suggests that the cost of capital – particularly equity – went down over time and across the different rounds. The GET FiT Programme rightfully decreased the top-up over the rounds to account for lower investment risks

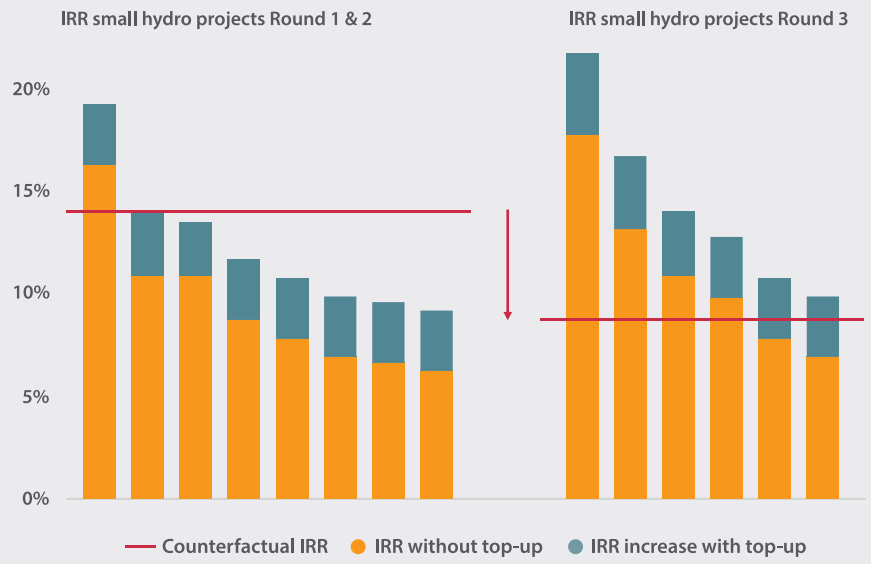


Figure 16 - The required profitability of the projects dropped across the three rounds, due to lower investment risk

in Uganda. Nonetheless, our research indicates, that in retrospect, the phase out could have been faster.

While these findings may provide basis for further discussion on determination and adjustment of top-up levels in future GET FiT schemes, it should be noted that the counterfactual IRR only provides an indicative level of market IRR – different hydropower projects and different investors have different return requirements. Moreover, additionality is difficult to determine due to significant uncertainty with respect to actual construction costs and the exact level of returns required by individual investors.

The GET FiT Programme in Uganda demonstrates that substantial declines in power cost are possible even

for mature technologies, such as small hydropower technologies, through lowering the cost of capital and risk perception of investors. For that a sound regulatory environment is critical, which includes a clear procedure for obtaining generation and environmental permits, interconnection and a solvent off-taker. This is particularly important for renewable energy technologies, where generally a greater proportion of the cost needs to be paid upfront compared to conventional technologies, such as gas plants. Hence, financing cost – cost of debt and equity – and risk perception are central cost drivers of these projects and maintaining a predictable investment environment is key to minimising project costs and ultimately electricity tariffs

About the Study

This section provided an overview of the ongoing research of KfW, German Development Bank, and the Centre of the Environment, Energy and Natural Resource Governance (C-EENRG) of the University of Cambridge on the impacts of the GET FiT Programme.
With our research, we hope to contribute to the academic literature and policymaking in two ways. First, many developing countries face the dual challenge of greening their energy mix – to emit less greenhouse gases and other pollutants – while achieving economic development to alleviate poverty and improve living standards. Hence, understanding how to best support developing countries, such as Uganda, in meeting these challenges is crucial for international climate and development policy. Second, we also intend to contribute to the debate on how to evaluate policies when true randomisation is not possible or the sample size is too small to perform more sophisticated statistical analysis.

In additional ongoing research, we attempt to understand whether the GET FiT plants, which are distributed geographically throughout Uganda, have led to lower power outages, using satellite data to capture variations in nightlights to proxy changes in outages related to the GET FiT plants.

The study on GET FiT is a joint work between Benedict Probst, Prof. Laura Diaz Anadon, Prof. Andreas Kontoleon at the University of Cambridge and Lotte Westermann (KfW). The study is envisaged to be published in the World Development special issue 'Latecomer Development in a Greening World'.

06 Lessons Learned

In the first half of 2018, a comprehensive effort was made across the GET FiT team to map out, elaborate and present key lessons learned from seven main areas of Programme implementation. This resulted in seven briefing notes (brochures) that were published through the GET FiT website and other channels such as the World Bank PPP Knowledge Lab. The brochures were prepared by Multiconsult, with key input from KfW and Development Partners.

In the following sections, additional Lessons Learned that have emerged in 2018 will be presented, addressing the learning points regarding the coordination with developers to reduce construction delays, dealing with minimum environmental flows of hydropower projects, the benefits of post-commissioning follow-ups, and the importance of a flexible TA design.

6.1 Reducing Construction Delays and Coordinating with Developers

Influencing developers and contractors to implement projects within the Programme's time-bound constraints has required contractual incentives, as well as increased and focussed Programme support to help guide them toward the finishing line.

The performance of developers and contractors during the GET FiT implementation phase has varied substantially, and significant delays have been experienced across a number of projects. Poor performance and delays have to a large extent been a result of deficiencies within developers' and/or contractors' organisations, weak EPC contracts between developers and contractors, inexperienced contractors, and limited onsite control and management.

Design teams common to multiple GET FiT projects have been stretched beyond capacity at various stages, resulting in delays in achieving design scheme freeze earlier during projects as well as the timely resolution of design issues and unforeseen conditions on site as they arise during construction. Ongoing design changes during construction have also resulted in substantial additional land acquisition and costs for some projects.

During 2017, GET FiT introduced several Programme management tools, which included increasing the frequency of supervision visits at the cost of the developer, unannounced site visits, temporary construction stops, as well as financial penalties, which were applied as an equivalent reduction in the allocated subsidy. During 2018, these tools were applied with increasing frequency to incentivise projects to complete in a timely and responsible manner. Temporary stops in construction and subsidy reductions were also applied to several projects in order to correct deficiencies, such as irresponsible construction practices in an environmental and social context (see Section 3 for further details), and to incentivise improvements in performance. Moving into 2019, additional quarterly visits will now be imposed on all but one of the remaining projects still to achieve commercial operation.

Increased supervision visits and Programme support during 2018 predominantly focussed on assisting developers and contractors to resolve design issues in an acceptable and timely manner and improving construction planning with the aim of minimising risks of further delays. Discussions have focussed on the sequencing and duration of works, understanding and managing risks such as periods of statistically higher river flows, changes in construction methodologies to achieve efficiencies and manage environmental and social risks, identifying potential weaknesses and bottlenecks in resources and supply chains, and allocating resources to meet construction schedules.

6.2 Dealing with Minimum Flows

Determination of environmental flows, the release of these flows and the monitoring and reporting to Ugandan lead agencies remain an unresolved issue where additional efforts are required by the GoU and project developers. GET FiT has identified key gaps and opportunities to close these.

The release of a minimum flow[4] is a standard mitigation measure for hydropower projects to reduce impacts on people and ecosystems along the affected river section between the intake and the point where water is returned to the river, a river section often several kilometres long. The volume of the minimum flow also directly impacts on the economic viability of a hydropower project (see GET FiT Annual Report 2017, pp. 49-50, for more information). Lessons on this important topic continued to be generated under GET FiT in 2018.

During the initial stages of GET FiT, the lack of clear expectations from Ugandan lead agencies on the requirements and frameworks expected to be followed when deriving minimum flows proved challenging to most project developers. Guidance on determining minimum flows is important to ensure predictability and transparency in the determination of minimum flow requirements. Therefore, programmes such as GET FiT may benefit substantially from modest early investments in improving clarity on environmental flow expectations together with relevant in-country authorities.

During detailed design and construction, a variety of solutions to release and monitor the minimum flows were proposed by project developers. Most of the proposed solutions were deemed not fit for purpose by GET FiT and multiple iterations were typically required to arrive at viable designs. Future programmes will likely benefit from clarifying minimum requirements for environmental flow release arrangements at an early stage and in collaboration with relevant lead agencies.

With an increasing number of GET FiT supported projects entering the operation phase, further lessons were identified in 2018. Release of minimum flow volumes below the requirements set by Ugandan authorities and GET FiT were uncovered along with missing or incorrect reporting to the relevant agencies. This underlines the importance of identifying appropriate monitoring mechanisms for the minimum flow releases and ensuring data is captured and available for independent verification. Future programmes like GET FiT could develop minimum requirements for monitoring and reporting in cooperation with relevant agencies, including the off taker of electricity generated that may have requirements for calculating deemed energy that may affect the minimum flow monitoring arrangements.

[4] *We refer to 'minimum flow' rather than the often-used concept of 'environmental flow' as the minimum flow requirements defined in Uganda (by the Directorate of Water Resources Management) usually do not have the characteristics of a true environmental flow, namely a description of the quantity, timing and quality of water flows required to sustain freshwater ecosystems and human livelihoods that depend on these ecosystems*

6.3 Operations and Maintenance

Follow-up during the operations and maintenance phase is essential for checking compliance with technical and environmental and social obligations and for providing valuable information with respect to the quality of the plant, installed equipment, and effectiveness of the planned preventative maintenance regime.

The Programme's follow-up should not end with the commissioning of a project. Continued follow up is important for ensuring continued compliance with technical requirements and environmental and social regulations and standards, including the resolution of key issues highlighted in the COD Report. During several post-COD follow-up visits in Uganda, issues previously identified as requiring attention have not always been addressed, and developers' attentions have been seemingly quickly diverted to other issues as soon the initial COD subsidy payment has been received. Post-COD follow-up is therefore essential for checking compliance, such as checking the correct operation and recording of minimum flow arrangements, which has been a repeated non-compliance on several GET FiT projects post-COD.

Developers are also generally required to follow a programme of planned preventative maintenance, to prolong the serviceable life of key components and the Project, and to keep records of maintenance works and report on the cause of each outage, whether for internal or external reasons, and planned or unplanned. Developers are required to provide a summary of these records as well as generation and line outage records at the time of applying for an annual subsidy payment, which allows for an assessment of the quality of plant and installed equipment, as well as the effectiveness of the planned preventative maintenance regime.

6.4 Post-COD Follow-up for Sustainable Projects and Sector Development

Monitoring visits after commissioning can ensure continued technical, environmental and social compliance and can close remaining knowledge gaps to improve project sustainability and sector performance.

Continued follow up through supervision and monitoring visits is not only important to ensure continued technical, environmental and social compliance but can also be a tool to continue closing knowledge gaps. This will, ultimately, enable more sustainable projects for the country and can contribute to learning for improved performance of the energy sector as well as agencies with responsibility for the environment, water resources management and social development.

GET FiT Uganda is committed to continued monitoring visits after project commissioning and undertook one scheduled post-COD visit to a commissioned project in 2018 and several unannounced visits. Several post-COD visits are planned for 2019 as more projects will have been in operation for more than a year. These visits are important to follow-up on remaining issues at COD and have already given useful new insights relevant to ERA and other agencies in Uganda; for instance on challenges in handling sediments and minimising related damage to turbine runners as well as non-compliances in releasing and monitoring environmental (minimum) flows in hydropower projects (as addressed in the previous section). Having worked closely with and benefitted greatly from ERA throughout the GET FiT Programme, joint post-COD visits also provide a good basis for the final handover of the Programme to ERA.

Originally, post-COD supervision was not part of the Programme scope and budget. However, once the need was established some funding was made available for this purpose. An important lesson for similar projects in the future should be to incorporate post-COD supervision and follow-up in the Programme design at an early stage, particularly in order to secure funds and other resources needed.

6.5 Flexibility of Technical Assistance Design and Use of Funds

In a long-term programme, provision of Technical Assistance (TA) should not be entirely pre-defined but have sufficient flexibility to adapt to real and emerging needs identified during implementation.

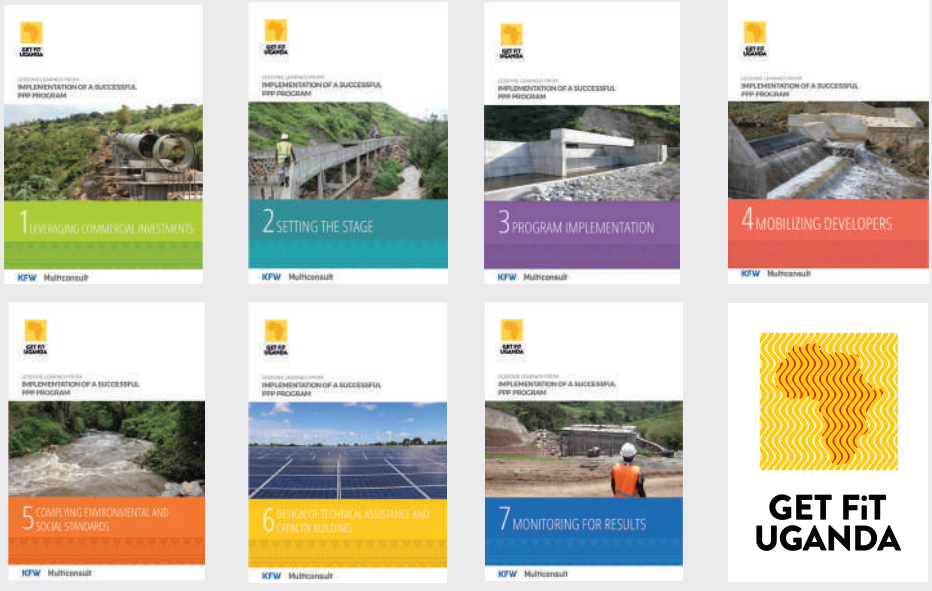
The provision of TA must be able to adapt to new intelligence and emerging needs, which requires donors to structure such programmes in a flexible way and provide funding accordingly. With its flexible design, GET FiT has provided on-demand TA based on observed gaps as well as needs identified by ERA. This was possible due to 1) a flexible frame budget for TA provided by the Development Partners, 2) a close working relationship between ERA, KfW and the Consultant throughout Programme implementation and 3) a willingness and ability to re-allocate available funds to other critical areas of TA.

Potential TA activities were added to a shortlist by ERA in cooperation with GET FiT and was considered a living document. Specific TA needs where outlined as they emerged, and gradually expanded and detailed. This process enabled ERA to address capacity gaps as they emerged. Since the scope and objective of activities are already outlined, a timely implementation of these is possible, aided by the flexible TA budget provided by Development Partners. While the provision of Technical Assistance is not the primary objective of GET FiT, the flexibility and timely implementation of such tailored assistance has a positive impact on the implementation of the GET FiT portfolio and increases the sustainability of the GET FiT Programme on the Ugandan power sector.

The GET FiT Lessons Learned Briefing Notes

More insights for the design and implementation of Public-Private Partnership (PPP) infrastructure programmes can be found in the GET FiT Uganda Lessons Learned Briefing Notes, which serve as an input for the GET FiT concept and rolling out similar programmes in other countries. Seven briefing notes were prepared and published on the GET FiT website, as well as on World Banks's PPP knowledge lab. The following topics are covered:

- Leveraging Commercial Investments
- The Building Blocks of a Successful PPP Programme
- Programme Implementation
- Developers Engagement
- Complying with E&S Performance Standards
- Making the Impact Stick
- Monitoring for Results



07 Other Activities

7.1 GET FiT Visibility

Commissioning Ceremony of the Lubilia Hydropower Project

The 5.4 MW Lubilia SHP was officially commissioned on June 28, 2018. The project was developed by DI Frontier Market Energy & Carbon Fund, a Danish private equity fund with a portfolio of renewable energy projects in Eastern Africa. The Netherlands Development Finance Company (FMO) was the lead arranger of the USD 10.2 M senior loan facility, 50 % of which was syndicated to the Emerging Africa Infrastructure Fund (EAIF).

The commissioning ceremony was presided over by the Minister of State for Mineral Development, Hon. Peter Lokeris, and attended by the German Ambassador, Dr. Albrecht Conze, the Norwegian Ambassador, Susan Eckey, as well as high level representatives of other key stakeholders including ERA and KfW.

Figure 17 – Attendees at the Commissioning Ceremony inside the Facilities of Lubilia.

Figure 18 - Hon. Peter Lokeris (2nd left), Edward Iruura (ERA), Dr. Albrecht Conze, Susan Eckey and Daniel Schultz (DI Frontier) Touring the Commissioned Lubilia SHP

Commissioning Ceremony of the Nkusi Hydropower Project

The 9.6 MW Nkusi project was officially commissioned on 11th October 2018. The project was developed by PA Technical Services and financed by the Trade and Development Bank. The Chief Guest was the Minister of State for Minerals, Hon. Peter Lokeris, who represented the Government of Uganda. The ceremony was also graced by the presence of Members of Parliament from the Natural Resources Committee, representatives from MEMD and the Board and Management of ERA. The GET FiT development partners were represented by the Ambassador of Norway, Ms. Susan Eckey and the Deputy Ambassador of Germany, Ms. Petra Sabine Kochendörfer and KfW.

Figure 19 - Nkusi Commissioning Ceremony. L-R: Petra S. Korchendörfer (Dep. German Ambassador), Susan Eckey (Norwegian Ambassador), Hon. Peter Lokeris, Zaneta Freyer (PATS), Eng. Ziria Tibalwa (CEO, ERA) and PATS Representatives

Figure 20 - Dignitaries from the Uganda Parliament, MEMD, GET FiT Development Partners and ERA at the Nkusi SHP Powerhouse During the Project's Commissioning Ceremony

Commissioning Ceremony of the Nyamwamba Hydropower Project

The 9.2 MW Nyamwamba SHP held its inauguration ceremony on 14th August 2018. The project was developed by South Asia Energy Management Systems (SAEMS) LLC and financed by FMO. The Chief Guest was the Vice President of the Republic of Uganda, HE. Edward Sekandi. The ceremony was also attended by the Minister of Energy and Mineral Development, Hon. Irene Muloni, the Minister of State for Energy, Eng. Simon D'Ujanga, the Permanent Secretary MEMD, Robert Kasande and a host of representatives from GoU and the developer.

Figure 21 - The Vice President, HE. Edward Sekandi (L) and Minister of Energy and Minerals, Hon. Irene Muloni Officially Commission the Nyamwamba SHP

Figure 22 - The Vice President Greets the SAEMS Chief Technical Officer at the Kyambura Commissioning Ceremony

7.2 Knowledge Transfer

The joint implementation of a sizable project portfolio within a limited timeframe provides a unique and important opportunity for knowledge transfer between ERA and the GET FiT Implementation Consultant. Following requests from ERA, specific areas of knowledge transfer closely linked to the implementation of the GET FiT portfolio were established and are now being implemented. In 2017, a Concept Note outlining a range of activities was developed by ERA with support of the Implementation Consultant (Multiconsult), and the following areas of knowledge transfer were selected. The knowledge transfer is funded by DFID.

1. Management of renewable energy projects under construction.
2. Follow-up of environmental & social compliance for renewable energy projects.
3. Design optimisation for small hydropower plants.
4. Determination of Return on Equity in the Ugandan electricity supply industry.

Item 4 above was concluded in 2018: In the determination of the Ugandan Renewable Energy Feed in Tariff in 2016, assumptions were made by ERA regarding the applicable Return on Equity (ROE) for the respective technologies. However, ERA was lacking a clear methodology for determination of ROEs. In order to provide more certainty to developers during investment decisions, ERA needed to establish a methodology and model template. To address these needs, ERA, with support from the Consultant, developed a regulatory framework document for the determination of Return on Equity in the Ugandan electricity sector and an associated Excel model for calculation. The work was carried out during the first half of 2018 and included a one-week workshop and training in Kampala for ERA staff, organised by the Consultant as part of the GET FiT knowledge transfer component.

Items 1 to 3 were integrated in the activities of ERA together with the Implementation Consultant during supervisions visits and through the organisation of workshops, establishment and institutionalisation of procedures and checklists, as well as discussions on practical and academic matters. A knowledge transfer planning session between the Implementation Consultant and ERA was undertaken during the Q2 2018 supervision visit, and capacity building requirements identified in relation to the **engineering design and construction supervision of hydropower projects.** In addition to the sharing of knowledge and experiences during jointly undertaken supervision visits, capacity building in relation to Health & Safety aspects was particularly highlighted by the ERA team as an important learning area. In that regard, training and reference material in relation to key construction activities such as working at height and with scaffolding systems, excavation practices, the use of personal protective equipment, etc. were shared. Additionally, **identification and documentation of design issues, inspection procedures, and checklists were developed** further prior to an initial workshop between key Multiconsult and ERA team members in Kampala in Q3 2018. Further workshops are planned during the first half of 2019 to consolidate and finalise the procedures and checklists and to plan for the preparation of institutionalised documents to be used by ERA in the future.

ERA's environmental and social staff worked with the Consultant in developing guidance material, undertaking joint construction supervision and post-COD visits, and in analysing lessons from GET FiT projects as the basis for practically oriented knowledge transfer. **Environmental and social checklists** reflecting both Ugandan regulations and international standards have been drafted, tested and refined during supervision visits and will be finalised in the first half of 2019. The checklists refer mainly to hydropower project development, construction and operation - and will feed into ERA's work in reviewing applications for feasibility study permits and generation licences, as well as the compliance monitoring for licensed projects. Lessons are being analysed and documented with the objective of preparing conference papers and journal articles for dissemination in and beyond Uganda and based on the unique sample of project lessons that the GET FiT portfolio represents.

7.3 Efforts towards Integrated Sector Planning

Experience from GET FiT implementation has indicated that integrated sector planning has not received sufficient attention in the quickly expanding Ugandan power sector in recent years. Generally, it has been observed that the Ugandan electricity sector would benefit from a clearer policy on the role of private and public sector actors and improved predictability in long term sector planning. Integrated generation, transmission, distribution and consumer investment planning would reduce underutilisation of assets in certain sub-sectors or regions. Moreover, improved financial planning and optimisation along the electricity sector value chain would enable more efficient use of funds and contribute to reducing financial costs and technical losses.

Despite the considerable success of the GET FiT Uganda Programme to mobilise private sector investments into new renewable energy projects, several areas of potential improvement have been recognised across the various frameworks and processes involved. This has particularly been related to procedures for ensuring timely and adequate grid connection for IPPs, as well as electrification potential in the vicinity of new projects. DFID has engaged an external consultant (Ricardo) to identify potential measures to improve the framework for energy access around new IPPs and the capacities of relevant GoU institutions. To this end, DFID has identified three key areas for potential future support to ensure the sustainable transformation of the small to medium sized electricity generation market in Uganda:

1. Possible electricity access for communities close to generation sites
2. Contracting with developers and provision of necessary grid infrastructure
3. Environmental and Social safeguards

During development of renewable IPPs in the GET FiT Uganda portfolio, reinforcement of local networks is being undertaken to accommodate evacuation of power. However, this does not necessarily lead to increased electricity access for local communities, which is the mandate of either REA or local distribution companies. Introducing local electricity access as an integrated or related component in IPP development can be one way to increase positive economic impacts locally, and to maintain or strengthen local support for IPPs. On this basis, part of the consultant's scope will be to map out the electricity needs of affected communities and look at how this may be addressed during or after project implementation. Adequate integration of international standards for environmental and social compliance will also be a key aspect in this regard.

7.4 GET FiT Zambia Launch

In February 2018, the second GET FiT Programme - GET FiT Zambia - was officially launched in Lusaka. This represents a major achievement for GET FiT and strengthens its prospects in Sub-Saharan Africa.

The Programme aims to support the Zambian Government in the implementation of its REFiT Strategy, which was published in late 2017. In line with this Strategy, the Programme aims to procure 200 MW of renewable energy projects in the next three years. Similarly to GET FiT Uganda, the focus of GET FiT Zambia is small-to-medium projects with up to 20 MW in capacity from IPPs – also in line with the Zambian REFiT Strategy. The Programme received a funding pledge of circa EUR 31 million from the German government.

The first phase of the Programme has been launched with a 100 MW Solar PV tender. The RfQ was successfully completed with the announcement of ten shortlisted applicants in June 2018 – followed by the submission of proposals in November 2018. Fifteen project proposals from eight bidders were received. Besides its solar component, GET FiT Zambia also includes the procurement of 100 MW in hydropower. The Prequalification for the 100 MW hydro tender launched in January 2019. Moreover, a 5 MW solar micro-generation window is foreseen, designed to facilitate participation of local companies in the power sector and contributing to local capacity building and leveraging of Zambian investments.

An additional focus is to encouraging the private sector to take stake in the energy sector to strengthen the Zambian power market. As such, increasing the institutional capacity, as well as the policy and regulatory framework for renewable energy IPPs in Zambia is an essential aspect of the Programme.

Similarly to GET FiT Uganda, GET FiT Zambia is implemented by KfW, through the Programme Implementation Consultant Multiconsult. The Zambian Ministry of Energy (MoE) is the owner of the Programme. Other key stakeholders include the Zambian Energy Regulation Board (ERB) and the state-owned power utility Zesco Ltd.

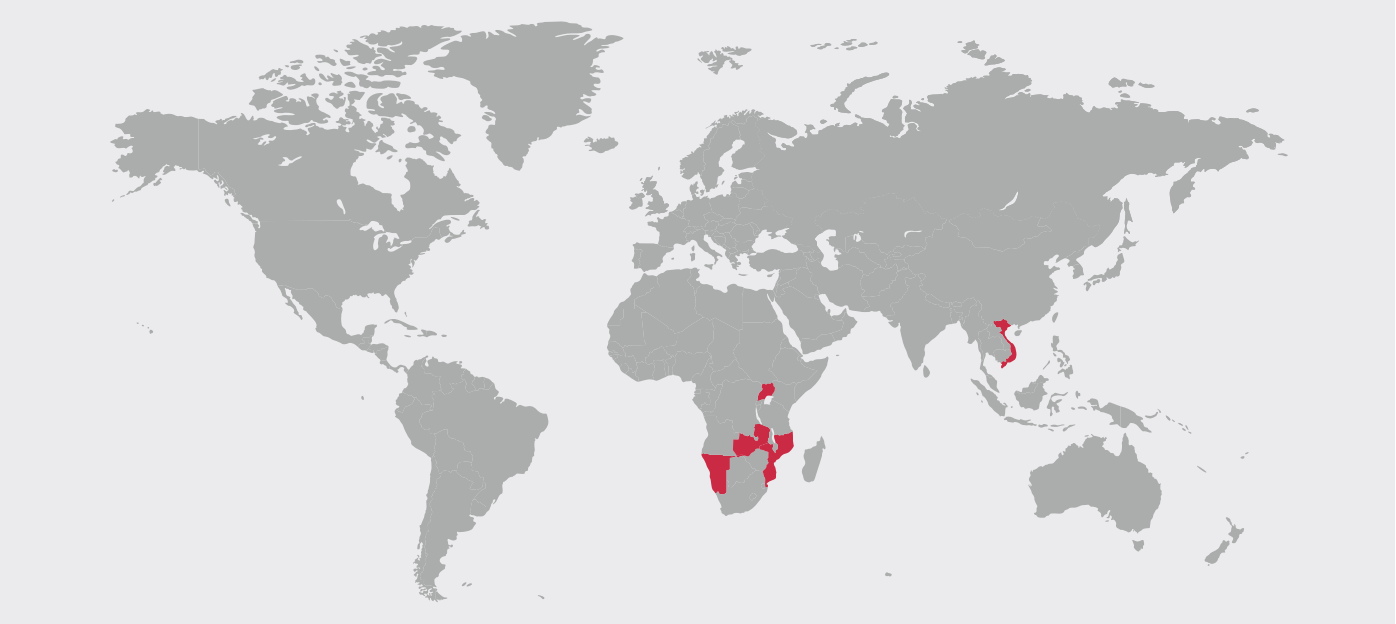
7.5 GET FiT Roll-Out in Other Countries

Although a Renewable Energy Feed-in Tariff (REFiT) was introduced in **Mozambique** in 2014, private investments in renewable energy projects have not yet materialised as expected. More incentives such as tariff support and risk mitigation are needed to harness private investments in renewable energies in the country. Therefore, the Government of Mozambique is intending to implement a GET FiT Programme. To prepare the Programme, a design and implementation study, financed by the Government of the United Kingdom through KfW, was undertaken in 2018. GET FiT Mozambique aims to support about 140 MW of renewable energy projects financed by IPPs within the next years. Potential activities within the project are tariff support for IPPs' investments as well as the establishment of a facility for grid integration and risk mitigation. The project is in its preparation phase. Implementation is planned to start in 2020. The German government has committed 25 million Euro in support of GET FiT Mozambique which will be implemented through KfW. Additional financing will be requested from other development partners.

The Interim Renewable Energy Feed-in Tariff Programme (Interim-REFiT) was introduced in **Namibia** in 2015 and will contribute to mobilising private investments into small-scale energy projects with a total capacity of 70 MW. However, the Namibian Interim REFiT Programme attracted investments mainly into solar energy, whereas investments into other renewable energy resources did not materialise as expected. Namibia is particularly interested in supporting the utilisation of encroacher-bush, as more than one third of Namibia's surface is covered by it as a result of intensive farming. The bush encroachment suppresses the growth of grass, reduces biodiversity and reduces the penetration of rainwater required to recharge the all-important underground water resources.

In order to explore the utilisation of encroacher bush as a renewable resource for electricity generation, the Government of Namibia has requested KfW to undertake a detailed design and implementation readiness study to develop a programme concept for a GET FiT Programme 'bush-to-electricity' in Namibia. The study is financed by the Government of Germany and will be concluded during the second quarter of 2019.

Based on an earlier commitment by the German Government, in December 2017 KfW signed a financing agreement with the Government of Vietnam over EUR 14.5 million for the Renewable Energy Development Facility GET FiT **Vietnam**. Additional financing of EUR 14 million has been requested from the EU but has not been committed. Implementation details remain to be discussed with the main Implementing Partner, the national power utility Electricity of Vietnam, so that the GET FiT facility is expected to be operational by mid/end 2019.



08 Financial Status

8.1 Funding Commitments

GET FiT Uganda is a results-based Programme – that is, a subsidy is paid following the successful installation of power capacity and the delivery of power – and is therefore dependent on predictable commitments from sponsors in order to be successful. Since the commencement of the Programme in 2013, several changes to the portfolio structure and significant project delays have necessitated active follow-up and flexibility from all stakeholders. This requirement has indeed also been met by the GET FiT funders to date, enabling the Programme to deal with any arising uncertainties and risks in a relatively comfortable and pro-active manner. To this end, four development partners have taken up the challenge and provided GET FiT with the necessary funding: Government of Norway, Government of UK (through BEIS and DFID), Germany (BMZ) and the EU (through EU ITF).

To date, EUR 93 million has been committed to the Programme.

Donor	Net amount committed (EUR)
Norway	15,590,475
UK BEIS	28,262,050
UK DFID	14,128,113
GER BMZ	15,000,000
EU ITF	20,000,000
Total	92,980,638

Table 4 **-** Overall Donor Commitments to GET FiT

Note: Net amounts are based on funding disbursed to the Programme thus far, projected exchange rates for undisbursed funds and deduction of management fees.

Foreign exchange rate developments within the financial structure of the Programme reduced the overall budget by approximately 13 % as of mid-2015. Subsequently, a EUR 1.5 million budget buffer was introduced to cushion future decline in the EUR/GBP rate until remaining disbursements were made to KfW and converted in EUR. Reference is made to previous **GET FiT annual reports.**

A limited amount of undisbursed donor contributions remains at this stage, currently equivalent to approximately 8 % of the total GET FiT budget and are therefore still subject to foreign exchange risk. GET FiT regularly monitors the relevant forex developments to allow for proactive actions if needed.

8.2 Disbursement Projections

Committed disbursements from the GET FiT Programme go towards four purposes:

i. project grants, with 50 % paid at commercial operation date and 50 % paid in the form of results based support over the first five years of operation, subject to actual generation,
ii. consultants under the Technical Assistance Facility for ERA,
iii. consultants for the overall management and monitoring of the Programme, and
iv. management fee to KfW.

Figure 23 illustrates the actual (up to and including 2018) and projected disbursements from the Programme. The projections are based on the status of the project portfolio and expected progress. Due to the provision of results-based disbursements during the first five years of operation for each project, the final payments from GET FiT will not occur before 2024.

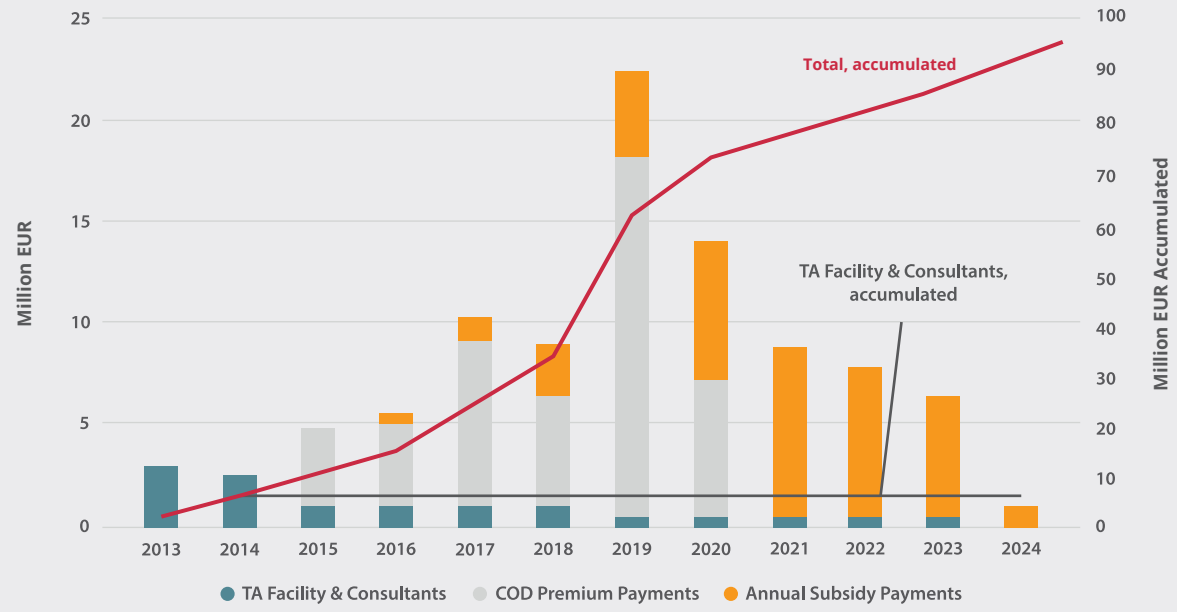


Figure 23 - Projected Annual Payments (Premium Payments and Consultants) under GET FiT

Note: Projections are subject to uncertainty, mainly related to individual project progress

For the disbursement projections, the main uncertainty relates to actual COD for the various projects. Delayed implementation of the portfolio has already shifted the disbursement profile of the Programme considerably. With most projects now financially closed and under construction, future changes in the disbursement profile will be linked predominantly to construction related risks. There is also some uncertainty tied to the annual result-based payments for each project. Since the developers will only be paid for what they are producing (with a cap at their planned average), significant under-production across the portfolio may lead to accumulation of excess funding.

The annual GET FiT Steering Committee (SC) meeting was held on April 24, 2018 in Kampala in the presence of representatives from the German Embassy, DFID, BEIS, the European Union, ERA, the Embassy of Norway, MEMD, KfW and the GET FiT Secretariat (Multiconsult). During the meeting the current implementation status of the Programme was presented, and challenges relating to the grid integration and power evacuation

were highlighted by the GET FiT Secretariat. This was complemented by an update of developments in the power sector by ERA and MEMD. A key topic of the meeting was the funding status, budgeting and disbursement of Programme funds – the SC concluded that no disbursements to projects will be made after 2023, which is in line with the initial window of GET FiT support. The SC also decided that an exception is made for the Kikagati SHP, upon the consideration of transboundary issues the project was facing.

Figure 24 shows the relative shares of the various cost components under the GET FiT Programme, based on current budget reservations. Overall, approximately 10 percent of the overall funds are tied to management, implementation and the Technical Assistance Facility, while 90 percent of the total commitments are expected to be disbursed as premium payments.

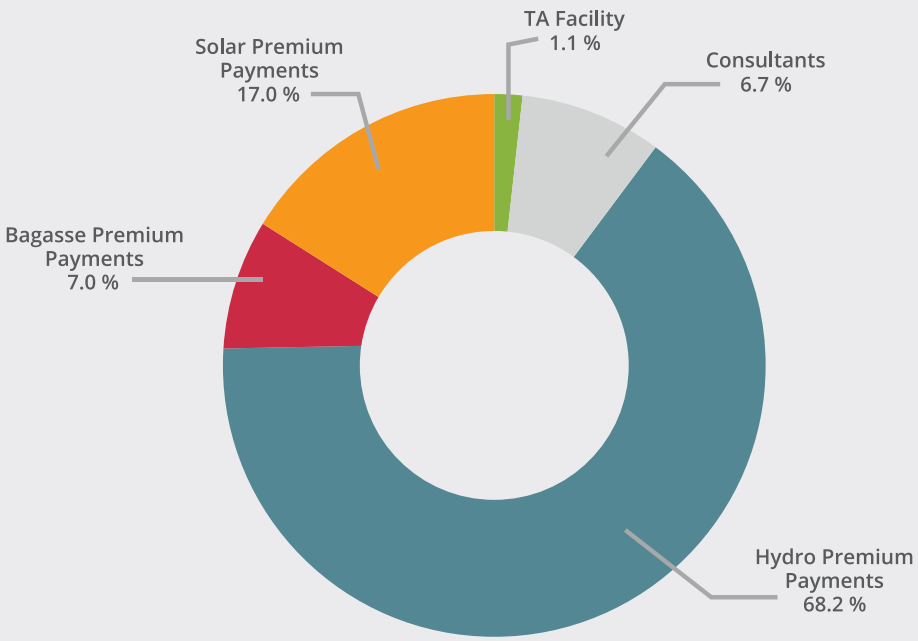


Figure 24 – Distribution of Budget Reservation of GET FiT Uganda

09 Programme Monitoring & Risk Management

9.1 Programme Monitoring

The GET FiT Monitoring and Evaluation framework monitors the results of the Programme through several quantitative indicators, which are collected from project developers and key sector stakeholders on a semi-annual basis. The Programme's monitoring and evaluation is structured in a logical framework (Logframe) outlining the relationship between targeted Outputs, Outcomes and Impacts and setting baselines, expected milestones and targets.

The Programme is still behind schedule on achieving the original capacity targets, which aimed at full commissioning of the RE portfolio by the end of 2018. This is mainly due to the many delays in bringing individual RE projects to financial close and construction start. However, after years of intensive efforts and a good number of projects (10 out of 17) now commissioned, the Programme is progressing well on most of the targeted results.

Due to a lower portfolio share of biomass projects than originally anticipated, and a significant reduction in Programme funding, the original capacity targets (170 MW installed and 830 GWh/year) of the portfolio will not be fully achieved. Other indicators that are directly linked to these capacity targets, such as private finance mobilised and displacement of thermal generation, may also be affected by the overall capacity reduction. The current GET FiT portfolio has a planned capacity of 158 MW and 765 GWh/year, of which more than half has now been commissioned.

On some indicators, such as job creation, the Programme is already exceeding original targets.

An overview of the targeted Outputs, Outcomes and Impacts is provided in the overview below. The following section will address these goals in more depth, providing details and context on the development of the Programme.

Outputs	Outcomes	Impact
1. Increased small scale RE capacity & generation.	1. Improved private sector investment environment for renewable energy in Uganda.	Uganda pursues a low carbon, climate resilient development path, resulting in growth, poverty reduction and climate change mitigation.
2. Balanced portfolio of RE techologies.	2. Improved financial stability of energy sector.	
3. Reduced GHG emissions.		
4. Increased number of Ugandan national jobs.		
5. Increased capacity of ERA.		
6. Finance mobilised for GET FiT portfolio.		

Table 5 - Overview of Impact, Outcomes and Outputs

Outputs

The Programme made good progress on a range of Programme monitoring indicators in 2018. Electricity generation picked up considerably with over 270 GWh delivered to the grid during the year, representing approximately 65 percent of the entire portfolio generation to date. This is still significantly lower than the expected annual generation of commissioned projects, due to commissioning of projects during 2018, and grid-related issues causing high deemed energy levels for certain projects. With ten projects now to produce a full year and others set for commissioning, overall portfolio generation is expected to substantially increase in 2019.

In terms of geographic and technological diversification, GET FiT is represented in most sub-regions of the country and supports three renewable energy technologies. While projects were received during the appraisal stage, Northern Uganda is the only region with no GET FiT project in the portfolio, while the rest of the portfolio has a strong presence in Western Uganda, but is also represented in Central, Eastern and South-Western parts of the country. The portfolio includes projects with three technologies – Solar PV, Hydro and Bagasse – and is thereby diversifying the Ugandan energy mix.

With an increasing level of energy generation, the Programme portfolio is contributing to reducing Uganda's GHG emissions. According to UETCL, energy generation from the GET FiT portfolio is currently offsetting generation from the available grid connected thermal (fossil fuelled) power plants. However, due to the overall implementation delays for the portfolio, GET FiT is not yet able to offset all the thermal electricity generation to the Ugandan grid. This is particularly due to an unusually high level of export from Uganda to Kenya in 2018, which has led to increased dispatch of the thermal generators. It will be exciting to see to what extent GET FiT can continue to offset thermal generation in 2019, particularly while awaiting commissioning of the new large hydropower plants in Uganda which should lead to further displacement of thermal energy generation.

The GET FiT portfolio has direct effects on the local economy and made a substantial contribution to local job-creation. This is represented by over 8,500 newly created jobs (FTE's – Full Time Equivalent) in relation to the portfolio alone, by far exceeding the initial target. The share of Ugandan employment is around 90 percent.

Finally, GET FiT projects have raised over USD 450 million in investments for the portfolio – approximately USD 160 million in private, and USD 190 million in public funding. Private financing represent a share of approximately 35 percent. All but one project has achieved financial close, and the Kikagati SHP expects to reach financial close in the first half of 2019.
An overview of all Output indicators is presented in Table 6.

Indicator	Target 2023	Status 2018	Target Achieved	Comment
Output 1 – Increased small scale renewable energy capacity and generation				
Indicator 1.1 MW installed	170 (158.4)	**87.1**	51%	The current portfolio has a planned capacity of 158.4 MW. The original target of 170 MW will not be achieved due to lower availability of Programme funds and a lower share of biomass projects than originally expected.
Indicator 1.2 GWh/year delivered to the national grid	830 (765)	**270.8**	34%	Commissioned projects have an expected annual generation of 399 GWh. The current portfolio has a planned total output of approximately 765 GWh/year.
Output 2 – Balanced portfolio of renewable energy technologies				
Indicator 2.1 Number of technologies supported by GET FiT	4	**3**	75%	Supported technologies include hydropower, solar PV and bagasse.
Indicator 2.2 Number of sub-regions with GET FiT projects	5	**4**	80%	The GET FiT portfolio includes 4 regions: Western, South-Western, Eastern and Central.
Output 3 – Reduced GHG emissions				
Indicator 3.1 Net change in GHG emissions (Cumulative MtCO2e)	4.03	**0.45**	11%	Power generated from the GET FiT portfolio is currently offsetting thermal generation and reducing GHG emissions. The indicator is behind target due to the delayed portfolio implementation.
Output 4 – Increased number of Ugandan national jobs				
Indicator 4.1 Number of direct national construction and O&M jobs created	4.200	**8.658**	206%	GET FiT is exceeding targets on this indicator. Approximately 2,700 full-time equivalent (FTE) jobs were created in 2018. The accumulated 2018 figure has been adjusted for an error in employment figures reported in 2017.
Output 5 – Increased capacity at ERA				
Indicator 5.1 Time taken by ERA to review generation licence for 1-20 MW renewable energy applications (months)	2	**1.1**	n/a	The time to review generation licence applications has decreased considerably from approximately 2 months in 2017 to about 1 month in 2018.
Indicator 5.2 Number of REFiT tariff reviews taking place by ERA per year	1	**0**	n/a	Tariffs were revised in 2016 for the period 2016-2018. Another REFiT review is currently ongoing.
Indicator 5.3 Timely and complete reporting to ERA by licensees	100%	**79%**	79%	24 out of 31 licensees have submitted required reports complete and on time.
Output 6 – Finance mobilised for GET FiT portfolio				
Indicator 6.1 Private finance mobilised for GET FiT portfolio (in USD million)	200	**131**	66%	Only projects having reached financial close are included. The current portfolio estimate is at USD 162 million.
Indicator 6.2 Public finance mobilised for GET FiT portfolio (in USD million)	300	**237**	79%	Only projects having reached financial close are included. The current portfolio estimate is at USD 291 million.

Table 6 **-** Output Indicators

Outcomes

The outcomes address the influence of GET FiT at a higher sector level, namely on the private sector investment environment for renewable energy in Uganda, and improved financial stability of the energy sector. A third indicator on local grid stability has been excluded from the logframe in 2018.[4]

Currently four commercial banks are financing projects of the GET FiT portfolio, while the Kakira project debt is entirely financed through commercial debt. As further projects are restructuring debt in the future, it is expected that more commercial banks will become involved in the Ugandan energy sector.

The regulator has issued only one development permit in 2018; however, seven generation licences for renewable energy projects with capacities under 20 MW, including six hydropower projects and one bagasse project. As highlighted in the Output section, the process of issuing generation licences has seen certain improvements as well, with a substantial decrease in review time of applications.

While the power utility UETCL has paid all its invoices for delivered energy in 2018, four developers have reported defaults on payments for deemed energy claims. However, the respective invoices for deemed energy were approved by ERA and subsequently paid in early 2019. These defaults are not considered for the indicator since deemed energy claims are not approved for payment by UETCL, but by ERA through the base consumer tariff, which is reviewed to include deemed energy only once a year.

The Government is currently not subsidising any thermal generation, and the GWh purchased from thermal power stations is at circa 200 GWh, well below the target of 832 GWh in 2023. However, capacity payments remain part of a subsidy by the Government, which signifies that the country has not yet achieved fully cost-reflective retail tariffs.

An overview of the Outcome indicators is provided in Table 7.

[4] *The indicators for Outcome 3 – Improved local grid stability have become inadequate in monitoring Programme performance due to various sector developments, particularly due to the many changes in regional and national grid infrastructure and particular network solutions for GET FiT projects. Following discussions regarding the data availability, validity and attribution (as Programme results), it was decided to remove both indicators for Outcome 3 (voltage variations and load loss at local substations) from the logframe. Notably, the TA provided by DFID via GET FiT on compliance monitoring is aimed at making grid performance data in Uganda more precise and accessible. Therefore, Outcome 3 might be re-introduced at a later stage.*

Indicator	Target 2023	Status 2018	Target Achieved	Comment
Outcome 1 – Improved private sector investment environment for renewable energy in Uganda				
Indicator 1.1 Number of commercial banks that invest in renewable energy for project finance lending for GET FiT projects	5	**4**	80%	Kakira has achieved full commercial bank debt. Currently, no Uganda commercial bank is among lenders, due to a lack of technical competence and energy sector experience, according to developers.
Indicator 1.2 Number of development permits and generation licences issued by ERA per year	12	**8**	58%	7 generation licences and one development permit were issued in 2018.
Indicator 1.3 Occurrence of annual "UETCL event of default" for energy supplied (deemed energy)	0	**0**	n/a	There have been four defaults reported on deemed energy payments. The process of deemed energy payment has been reviewed by ERA in early January 2019, as outstanding payments are processed in early January.
Indicator 1.4 REFiT adjusted to be cost-reflective (in percent)	100%	**100%**	100%	Based on a tariff review from Frankfurt School. REFiTs were approved by ERA for 2016-2018.
Outcome 2 – Improved financial stability of the energy sector				
Indicator 2.1 Subsidy paid by the Government for UETCL to cover thermal power use	0	**0**	n/a	All energy purchased beyond stand-by capacity was covered by tariffs.
Indicator 2.2 GWh purchased by UETCL from thermal stations	832	**199**	n/a	The sector is well below target due to i) lower demand for thermal power than anticipated and ii) thermal energy being offset by renewable energy from the GET FiT portfolio.
Indicator 2.3 Cost-reflective retail tariffs (in percent)	100%	**95%**	95%	Capacity payments remain part of the subsidy paid by the Government. These remained at the same level in 2018, and cost reflectivity therefore remains at 95 %.

Table 7 - Outcome Indicators

Impact

The Programme follows the impact statement "Uganda pursues a low carbon, climate resilient development path, resulting in growth, poverty reduction and climate change mitigation". Accordingly, the impact of the Programme is measured through three indicators, highlighted below. Due to the heavy reliance on the activities of key sector actors to reach the targets, the effects of GET FiT Uganda are limited to a certain extent, and subject to a time lag between GET FiT activities and observable results at a higher sector level.

Generally, a positive development on grid-related CO2 emissions can be reported. Increased energy generation from the GET FiT portfolio led to reduced dispatch of fossil fuelled power plants in 2018. The indicator is currently exceeding the target set for 2023. While this can largely be credited to renewable energy supplied from GET FiT projects, it is also partly due to a lower national electricity demand than originally projected.

The country has seen improvements in electrification rate and electricity consumption per capita. An increase to 22 % up from 20 % in 2017 has been reported in 2018. Similarly, the electricity consumption increased by circa 12 % to 101 kWh per capita, compared to 90 kWh per capita in 2017.

Table 8 provides an overview of the Impact indicator developments in 2018.

Impact Indicators	Target 2023	Status 2018	Comment
Indicator 1 Grid related CO2 emissions per unit electricity use	0.09	**0.037**	Grid related CO2 emissions decreased compared to 2017 from 0.042 to 0.037, which can be attributed to lower thermal generation in 2018.
Indicator 2 Percent of population with access to electricity	26.4%	**22%**	Electrification rate has increased from 20 percent reported in 2017.
Indicator 3 Electricity consumption (kWh per capita)	105	**101**	Electricity consumption per capita was at 90 kWh in 2017 - and has seen an increase in 2018.

Table 8 - Impact Indicators

9.2 Risk Management

Risk management is a continuous process running through the lifetime of a programme, where risks are identified and categorised, and measures introduced to reduce or eliminate the risks.

Grid connection. Grid connection problems are already significantly reducing the extent to which energy from GET FiT projects is being delivered to Ugandan consumers. While the overall energy produced from the GET FiT portfolio in 2018 (271 GWh) is by far the highest level to date, the total deemed energy across the portfolio totaled approximately 25 GWh. Further to this, projects due to commission in 2019-20 are also likely to generate considerable deemed energy due to outstanding grid infrastructure issues in 2019-2020. In addition to the mere energy lost for Uganda, this situation has introduced an increasing level of deemed energy obligations on GoU, which represents as a reputational risk for the GET FiT Programme. On this basis, the risk category is maintained with a high probability and high impact.

Project construction delays. Although ten GET FiT projects are now commissioned, seven projects remain under construction which represent approximately 45 percent of the total portfolio capacity. Certain projects have recently demonstrated unsatisfactory progress due to design and construction challenges and it is likely that some of these will not meet their extended deadlines (October 2019 for most projects). This will lead to subsidy reductions and thereby affect project viability and increase supervision cost. Therefore, project construction delays remain as a key risk towards achieving GET FiT capacity targets in a timely manner. This risk category is still rated with high probability and high impact.

Health, Safety and Environment (HSE). HSE risks across the portfolio have become increasingly real over the past year, with all projects now under construction. Despite projects being pushed on maintaining timelines, it is crucial that this does not compromise HSE performance in any way. GET FiT is not positioned to supervise or control the quality of developer's HSE work on a daily basis, and these risks are therefore not formally part of the GET FiT risk control framework. Nonetheless, GET FiT supervision visits focus on monitoring performance in that respect to the extent possible, discussing HSE standards with developers and creating awareness around potential risks.

An overview of the most relevant remaining risks across the Programme is presented in Table 9.

Description of Risk	Mitigation Actions	Progress	Risk Assessment
Deemed commissioning of projects due to poor coordination between developers and network operators, as well as missing funds, to ensure the infrastructure for grid connection.	Close constant follow-up with GoU, network operators and developers as project commissioning approaches.	Addressing risk with MEMD has increased the awareness and sped up processes at the responsible entities. The risk of a deemed commissioning of at least one project remains high.	high
Construction delayed or generation not at full capacity due to constraints of the national grid (HV/MV).	Funding for the critical grid investments has been secured through DFID to ensure power evacuation for GET FiT Projects. GET FiT is participating in the joint sector planning group for GET FiT interconnection and engaged in the analysis of deemed energy scenarios for the sector.	Contractors were mobilised for 33kV reinforcements in Western Uganda and construction of Opuyo substation started in September 2018. The risk of delays and deemed energy remains high due to an overall lack of progress on these grid interventions.	high
Corruption, misuse of funds and bribes paid by developers or contractors.	Subsidies are performance-based and disbursed for energy delivered. Zero tolerance in developer's contracts, and termination of contracts, as well as repayment of fees in case of paid bribes.	General risk remains until the commissioning of all projects.	medium
Compliance with Environmental and Social standards of developers.	Workshops on E&S standards were provided to developers. Penalties for non-compliance are incorporated in subsidy agreement (DFA). Additional supervision visits are carried out for critical projects.	Some projects still perform unsatisfactorily. GET FiT has carried out multiple additional supervision visits, and imposed penalties on some developers. Compliance is continuously followed-up, including post commissioning. The risk of non-compliance and associated reputational risks remain.	medium
Lower generation than estimated due to insufficient hydrological data and/or climate change.	Risks were included and diligently assessed in hydrological estimates and sensitivity testing at project evaluation stage.	Generation data for all projects is continuously followed up by GET FiT. The realisation of hydrological risks can only truly be assessed in the fullness of time, following a sustained period of generation (multiple years).	medium
Insufficient Programme funds due to foreign exchange rate developments.	Continuous budget monitoring allows for pro-active financial management and early identification of risks and Steering Committee action if needed.	Low risk level on original Programme budget (premium payments) due to most funds already disbursed there. Medium risk level remaining on grid connection component, where a funding shortfall is likely.	medium
Insufficient understanding of ground conditions results in substantial changes in the design and layout of projects and/or adverse environmental and social impacts as a result of landslides or similar during construction.	Developers required to provide updates on geotechnical conditions in the location of key project structures and in high risk areas during the implementation phase based on further investigations and assessments by geotechnical engineering specialists. Developers requested to address key geotechnical risks through changes in project designs and construction methodologies.	Several projects implemented changes in designs and construction methodologies in 2018 to improve the robustness of project designs and to reduce the likelihood of landslides. Further changes may be necessary for remaining projects during 2019 to manage residual risks.	medium

Table 9 **-** Overview of Key Risks

10 Outlook for 2019

In 2019, the Programme's focus will be on a close follow up towards the seven hydropower projects that are still under construction. These projects have already been granted extensions beyond the original window for GET FiT funding, and further delays will jeopardise their continued support from the Programme. Demonstrated efforts and progress is therefore key, and the GET FiT implementation consultant will undertake quarterly supervision visits for each project until COD is achieved. While it has already been established that one project will not reach COD until 2020, the other six are still targeted for completion by end of 2019.

To which extent the remaining projects will successfully achieve CODs during 2019 is subject to concerns. Some of the projects demonstrated poor progress in late 2018 and other projects are still facing significant risks related to grid connection. For several projects required grid extensions and reinforcements for adequate connection have not yet been implemented, with unsatisfactory progress throughout 2018. GET FiT will continue to push GoU entities on fast-tracking critical grid upgrades, also in 2019. This is important to safeguard the viability and reputation of the sector and to minimise the level of deemed energy payment obligations on GoU.

While remaining projects under construction are indeed a top priority, the GET FiT portfolio now has ten operational projects that require some level of follow up and support. The first years of operation are typically both technically and financially challenging, which evidently is also the case for recently commissioned GET FiT projects. Some projects are still struggling to evacuate power at full capacity due to remaining grid connection issues. Several developers have claimed deemed energy compensation due to grid outages and are currently in a process of retrieving payments for the same. The performance of Government agencies, network operators and developers themselves through these processes is highly important, and viable working relationships and routines must be well established to last for the upcoming decades. GET FiT is monitoring these developments and stand ready to facilitate constructive discussions if needed. A sufficient level of GET FiT involvement and understanding of ongoing issues is also important from a results-based subsidy payment perspective.

Finally, we are pleased to see that the GET FiT concept is now being rolled out or considered in a range of new countries. For GET FiT Uganda, which is moving towards the end of a successful implementation, it will be important to contribute to the wider roll-out by continuing to share experiences and lessons learned.

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