GET FiT UGANDA

ANNUAL REPORT 2019

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GET FiT UGANDA

Annual Report 2019

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Message from ERA

The Global Energy Transfer for Feed-in Tariff (GET FiT) Programme has left its mark on the Ugandan power sector. At the end of 2019, approximately 50 percent of all energy generation projects in the country were procured and supported by the GET FiT Programme, contributing to a greatly diversified power sector – institutionally, technologically and geographically.

When the GET FiT Programme was developed in 2012 by the Electricity Regulatory Authority on behalf of Government, and the German development bank – KfW, the prospect of local shareholding in power plants in Uganda was almost inconceivable. Yet through the GET FiT portfolio, the Nkusi (9.6 MW), Kyambura (7.6 MW) and Waki (4.8 MW) small hydropower plants that have a component of local shareholding have come to life.

Following the conclusion of funding and the success story of GET FiT in Uganda, it became a model programme which has been rolled out in other countries on the continent of Africa; in terms of implementation of small-scale renewable energy projects and the attraction of private finance into the energy sector.

I wish to convey special appreciation to the Government of Uganda and the Ministry of Energy and Mineral Development for trusting ERA as the GoU implementing agency, the Governments of the United Kingdom, Norway and the Federal Republic of Germany; the European Union, and other government agencies and stakeholders for making the GET FiT concept a huge success. Because of your unwavering support, Uganda is now a renewable energy investment model for the rest of Africa!

As we edge towards the completion of the GET FiT Programme implementation in Uganda, the Electricity Regulatory Authority is especially delighted to have supplemented efforts by the Government of Uganda to realize Vision 2040; through harnessing Renewable Energy to provide adequate generation capacity way before the commissioning of the large hydropower plants. Indeed, I can confirm that the GET FiT Programme has achieved the key objective for which it was established.

Eng. Ziria Tibalwa Waako | Chief Executive Officer, ERA

Message from EU

The GET FiT Uganda programme made further progress in 2019 with the commissioning of four additional small hydropower projects, namely Sindila, Siti 2, Kyambura and Ndugutu. This added over 35 MW in installed capacity and an estimated annual generation of 162 GWh to the Ugandan National Grid. In total, 14 of the 17 projects in the portfolio were operational at the end of 2019, representing 122 MW (77 %) of the targeted 158 MW of installed capacity. The remaining three projects are expected to be commissioned in 2020-21.

Besides the additional capacity for the country, the programme has also delivered on local content by creating approximately 10,000 jobs, comprised of circa 90 % Ugandan employees, spurring the local economy.

Moreover, GET FiT is supporting upgrades to the 33 kV transmission grid infrastructure in Western Uganda to ensure full evacuation of five projects, as well as an upgrade of the Opuyo substation in the East.

Key challenges in 2019 included delays in the implementation of the 33 kV grid reinforcements as a result of unexpectedly high wayleave costs, environmental and social compliance of commissioned projects and extended construction timelines of projects not yet commissioned. Addressing these will be a priority for the programme during 2020 to ensure its success.

As this is the last annual report to be published on this programme, it is the right time to pay tribute to the founders and implementing partners of this very successful and innovative programme. KfW has managed to spur a good spirit of cooperation among several development partners (Norway, UK, Germany and the EU), private investors and the Ugandan administration that yielded the good achievements mentioned in this report. Indeed GET FiT set several records: the first competitive auction programme for renewables in East Africa, the –then- biggest grid-connected solar PV plant in East Africa to name a few. And other countries have now replicated this same model.

The EU with its expertise and the right financial instruments, like the External Investment Plan, will remain a good partner of Uganda in this effort. Congratulations to all for all these achievements.

It is also not a coincidence that the Electricity Regulatory Authority (ERA) was ranked best regulator in the 2019 Electricity Regulatory Index for Africa. ERA has put in place with GET FiT an attractive regulatory framework and investment climate for private investment in the renewable energy space. It is a good example on how we can work together to promote investments but also to lead the way towards an inclusive, green economy in this country.

Attilio Pacifici | Ambassador of the European Union

Executive Summary

Powering growth. In 2019, GET FiT supported power plants provided approximately eight percent of the total electricity supply in Uganda. This was despite the commissioning of a new large hydropower project on the Nile (Isimba, 183 MW), which reportedly generated approximately 16 percent of the total national supply during its first operational year. In more round about terms, it is safe to say that GET FiT is currently powering almost one out of ten Ugandan electricity customers. Due to late commissioning of several plants in 2019, and a few projects still under construction, the annual energy delivered from GET FiT Uganda will increase further over the next two years.

With more than 50 million people and an on-grid electricity access rate below 30 percent, Uganda faces a challenging path towards the ultimate target of universal access to electricity. While considerable investments in large hydropower are currently being undertaken, these are largely centred on the Nile and ultimately dependent on Lake Victoria water levels, which cause vulnerability. With an increasingly robust portfolio of hydro, solar and biomass power plants, GET FiT has added much needed geographical and technological diversity to the power mix according to the key sector institutions Uganda Electricity Transmission Company Limited (UETCL) and the Electricity Regulatory Authority (ERA). In terms of national supply security, this aspect may turn out to be equally important as to the mere level of electricity generated.

Attracting investments. With 14 new power plants built in no more than six years (and three more yet to come), GET FiT Uganda has proven its unique ability to attract private sector investments. As of 2019, the Programme has leveraged over USD 455 million in private investments, including USD 165 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; 17 additional small-scale IPP projects have been issued generation licences and three have been constructed to date, still utilising and benefitting from the standardised PPA framework put in place through the GET FiT Technical Assistance Facility. Some of these projects are also being developed by GET FiT developers and/or contractors, building further on the competence and experience they have gained from within the Programme.

Best in Africa. While long-term effects of the Programme are still to be observed, indications of increased sector and regulatory capacity can already be reported in 2019: This year ERA issued 12 generation licences and development permits for new renewable IPPs, which already meets ERA's 2023 target. Adding to this, more timely and complete reporting by electricity sector licensees was observed over the last year. GET FiT supported the development of a new reporting framework, which appears to have strengthened ERA's ability to monitor and manage sector performance.

It is encouraging to note that the increasingly robust and conducive regulatory environment created by ERA and other stakeholders is well recognised internationally - for the second time in a row, Uganda was ranked number one in the Electricity Regulatory Index for Africa in 2019, by the African Development Bank!

Creating jobs. With a high level of construction activities in 2019, job creation from the portfolio continued to be substantial. Since the Programme was launched in 2013, an accumulated total of over 10,000 jobs (Full-time equivalent - FTE) have now been created through the project portfolio, with almost 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, for example, local economic growth, is not included but is expected to be significant.

Portfolio and performance. The GET FiT Uganda Programme made substantial progress in 2019. Four of the seven remaining hydropower projects with a total capacity of 35.3 MW were commissioned during the year including the Sindila SHP (5.3 MW), Ndugutu SHP (5.9 MW), Kyambura SHP (7.6 MW) and Siti 2 SHP (16.5 MW). These newly commissioned projects

resulted in the GET FiT portfolio reaching an installed capacity of 122.4 MW out of the expected 158.4 MW.

The GET FiT Portfolio of 14 operational projects now consists of 11 small hydropower projects (SHPs) with a combined installed capacity of 82.4 MW, two solar PV projects with a combined installed capacity of 20 MW, and one bagasse co-generation project with 20 MW installed capacity, all delivering clean, renewable energy to the Ugandan grid. Some of the earlier commissioned projects, now in their second or third year of operation, were able to ramp up their production to higher levels due to grid improvements. Overall, GET FiT projects delivered a total of circa 315 GWh in 2019, out of a total national supply of approximately 4,350 GWh.

At appraisal stage, the average annual generation of the portfolio's SHPs were estimated based on available gauged flow data, which was often incomplete or considered to be unreliable. With many of the plants now operational, the SHP generation data can be used to provide a more reliable and accurate record of the available hydrology at each plant each plant and river.

Comparing the SHPs' operational data with the estimated hydrology at appraisal stage indicates that the hydrology for 2019 was generally within the expected variation of an average hydrological year. The generation potential of the plants was generally either slightly more or less than the annual estimate at appraisal stage, with the overall average generation potential of SHPs equivalent to 107 % of the estimated total. Due to the partial availability of the grid, however, only 77 % of the electricity was actually delivered.

The finish line. With only three hydropower schemes still under construction, the full GET FiT portfolio is coming to fruition, with the remaining projects expected to commission in 2020-21. Actions have been taken by the Programme to incentivise Developers to minimise commissioning delays beyond the original 2018 funding window, including additional supervision visits and financial penalties in the form of subsidy reductions for delays. While several projects have responded positively and with increased efforts, the remaining projects still have work to do:

- Nyamagasani 1 SHP (15 MW) still has remaining construction challenges to be solved. Construction of the plant has been characterised by poor progress, and a landslide in the beginning of 2019 exacerbated this further, making works at the upper headrace canal, weir and intake challenging. Commissioning is currently expected in Q4 2020.

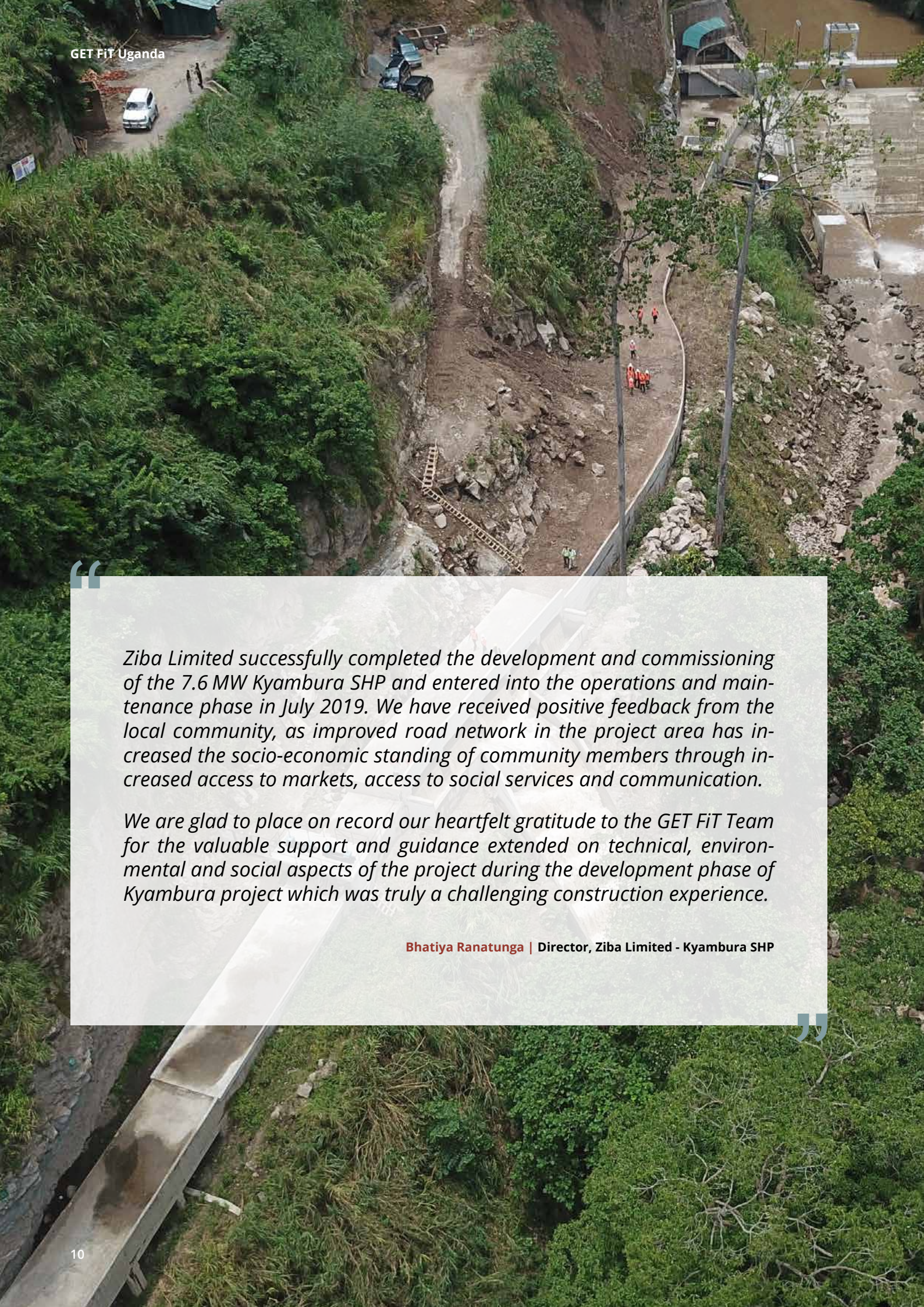
- Nyamagasani 2 (5 MW) is located downstream of Nyamagasani 1, forming a cascade. Except for the land slide, the project has been facing similar challenges as its neighbouring project and is expected to reach commissioning stage during Q2 or Q3 in 2020.

- For Kikagati (16 MW), key design issues were still to be resolved by the end of the year 2019, though the Developer still planned to achieve the contractual Commercial Operation Date (COD) by Q3 2020. There are, however, substantial construction works and risks remaining and there is potential for COD to be delayed until early 2021. Construction works for Kikagati SHP will expand across the border into Tanzania during 2020, and harmonisation and continued coordination with respect to requirements in the two countries is essential to avoid further unexpected delays.

Grid connection. In 2019, more than 20 % of the planned energy generation from GET FiT plants was not delivered due to missing or inadequate grid infrastructure, or insufficient grid capacity. Corresponding to approximately 96 GWh of renewable energy generation, this is a severe socio-economic loss and an unacceptable financial burden on the Government, which ultimately must be carried by Ugandan electricity customers. Development partners have provided considerable funding towards reinforcement of the local grid infrastructure to facilitate power evacuation from GET FiT projects. While contractors were mobilised in 2018-19 for some of the most critical components, other reinforcement needs are still not properly addressed or are behind schedule. 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 GoU agencies to facilitate high-level attention and coordination in fast-tracking the grid infrastructure, which will continue in the forthcoming year.

Outlook. With 14 of the 17 GET FiT projects now delivering power to the Ugandan grid, 2020 will be another exciting year for the Programme with persistent challenges and a lot to celebrate. Helping newly commissioned projects to achieve a successful first year of operation will be important, along with close follow-up for the remaining plants that are severely behind on their construction schedules but forecast by their respective Developers to commence commercial operations this year. As in previous years, continued efforts to ensure progress on grid infrastructure investments that affect GET FiT projects remain critical.

The finish line for GET FiT Uganda is undoubtedly approaching fast, after more than seven years of hard and dedicated work by a range of Ugandan stakeholders, project developers and development partners. Certainly, the Programme is already a success story, now contributing almost one tenth of Uganda's electricity from clean and renewable sources, funded mainly by private investors! However, as this report shows, work remains. Over the coming years, coordinated and dedicated efforts will be needed by all stakeholders to ensure a successful finish and a sustainable legacy.



Ziba Limited successfully completed the development and commissioning of the 7.6 MW Kyambura SHP and entered into the operations and maintenance phase in July 2019. We have received positive feedback from the local community, as improved road network in the project area has increased the socio-economic standing of community members through increased access to markets, access to social services and communication.

We are glad to place on record our heartfelt gratitude to the GET FiT Team for the valuable support and guidance extended on technical, environmental and social aspects of the project during the development phase of Kyambura project which was truly a challenging construction experience.

Bhatiya Ranatunga | Director, Ziba Limited - Kyambura SHP

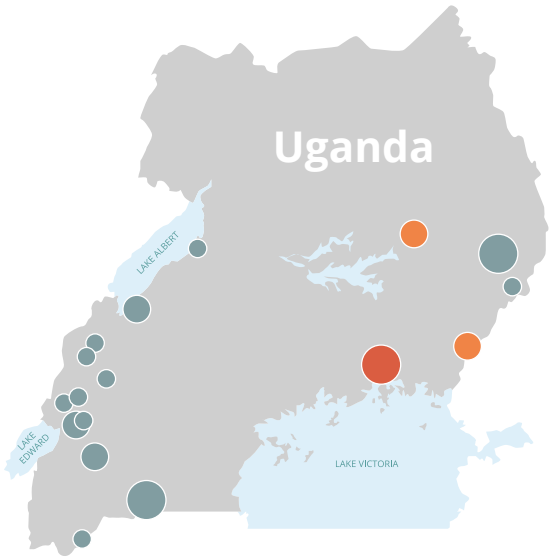
GET FiT PORTFOLIO

17 Projects

158 MW

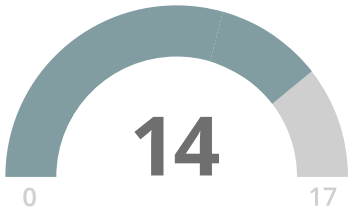
762 GWh/yr

Hydro	Solar PV	Bagasse
14 118.4 MW 581.7 GWh/yr	**2** 20 MW 33.5 GWh/yr	**1** 20 MW 147 GWh/yr



Hydropower Bagasse Solar PV

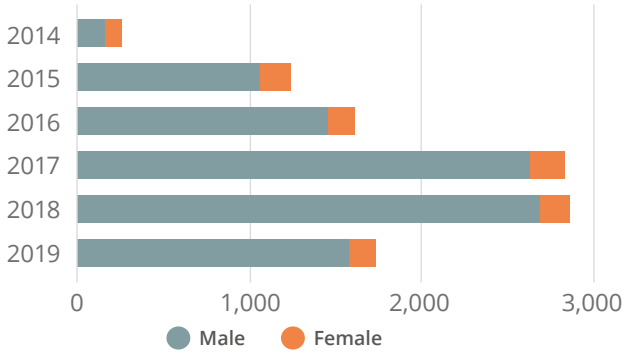
Projects Commissioned



Capacity Installed

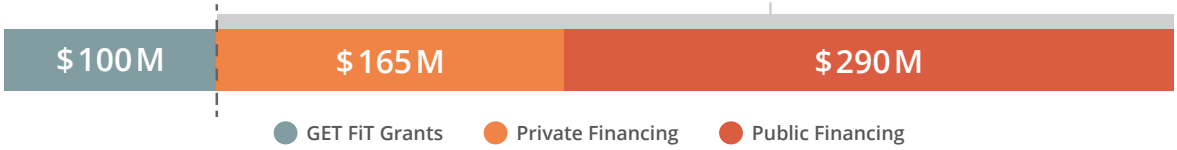
77% Of Portfolio Capacity Installed (MW)

Jobs Created
10,379
Ugandan Employment
89%



4.6 GET FiT Leverage Ratio

455 Million USD in Private Investments Leveraged



GET FiT Grants Private Financing Public Financing

Table of Contents

List of Abbreviations

COD	Commercial Operation Date
CP	Condition Precedent
BEIS	Department for Business, Energy & Industrial Strategy
DFA	Developer Financing 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 Assessment
EU ITF	European Union Infrastructure Trust Fund
GHG	Greenhouse Gas
GoU	Government of Uganda
GWh	Gigawatt Hours
IFC PS	International Finance Corporation Performance Standards
IPP	Independent Power Producer
MEMD	Ministry of Energy and Mineral Development
$MtCO_2e$	Million Tonnes of Carbon Dioxide Equivalent
MVA	Mega-Volt-Ampere
MW	Megawatts (of installed power capacity) 1 MW = 1000 kilowatts
PPA	Power Purchase Agreement
RE	Renewable Energy
REA	Rural Electrification Agency
RFP	Request for Proposal
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 investments 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 energy. 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 CO_2 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.
- Facilitating (or significantly improving) access to energy for at least 200,000 additional households (approximately 1.2 million people) also due to strengthening of regional grids.
- Leveraging more than USD 450 million in public and private investments for 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.

GET FiT UGANDA

02 Project Portfolio Progress

2.1 Portfolio Status

A further four small hydropower projects (SHP) completed construction works during 2019 and synchronised to the grid – Sindila, Kyambura, Ndugutu, and Siti 2 – adding 35.3 MW of power capacity to the Ugandan grid. Combined with the ten projects already operational by the end of 2018, the total installed capacity of operational GET FiT supported projects is now 122.4 MW – approximately 77 % of the total installed capacity to be implemented under the Programme (158.4 MW).

As a result, GET FiT supported projects supplied circa 315 GWh to the grid during 2019, corresponding to approximately seven 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 circa 750 GWh, equivalent to a saving of approximately 205,000 tonnes of CO_2 due to displacement of power production from fossil fuelled electricity production.

Progress in 2019 and Remaining Challenges

Of the seven SHPs still under construction in 2019, the performance of the Developers and their construction teams continued to vary substantially. Commendable improvements in construction practices and construction progress were observed for some projects, contrasted with continuing design changes, ongoing contractual challenges, and substantial delays in others.

The Developers of the remaining three SHPs in the portfolio yet to achieve commercial operation expect to be delivering electricity to the grid by the end of 2020, finally unlocking the remaining power system contribution from the GET FiT Programme. Of those three, the Nyamagasani 2 SHP is anticipated to complete construction and synchronise to the grid during Q2 or Q3 of the year, with the Nyamagasani 1 SHP following in the second half of the year. For both projects, which are being constructed by the same Developer, 2019 was characterised by generally poor construction progress. Contractual changes implemented by the Developer towards the end of the year were expected to resolve this issue and lead to accelerated construction progress in 2020. Key design decisions had predominantly been resolved for both projects, though for the Nyamagasani 1 SHP substantial construction challenges, risks, and uncertainties remained. The timely completion of the power evacuation line to both projects also remained a critical risk.

The last project still under construction, the Kikagati SHP, had also undergone further design modifications and optimisations during 2019 and also experienced construction delays. Substantial challenges and risks remain, including the potential for delays from cross-border construction activities between Uganda and Tanzania, which require careful coordination and management. Nonetheless, the Project planned to progressively commission and bring into operation the three generating units over several months in the second half of 2020, with all three units expected to be operational and COD achieved by Q4 2020. There are substantial construction works and risks remaining in order to commission the plant, however, and there is potential for COD to be delayed until early 2021. Either way, construction of key project structures was planned to continue into 2021, although the completion of these works and associated potential construction delays are not anticipated to affect generation.

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, the remaining three SHPs are expected to achieve commercial operation in 2020 and 2021.

Consequences of Delayed CODs

During 2018, the GET FiT Steering Committee 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. Based on updated assessments during the first half of 2019, however, it was clear that not all remaining projects would be able to comply with even the extended deadline. The Steering Committee subsequently concluded not to terminate the Developer Financing Agreements (DFA) with the projects not able to meet the extended deadline provided an addendum to the DFA was agreed with the remaining Developers, stipulating that for each full month of delay beyond 31 October 2019 a penalty of 5 % to the COD subsidy payment would be imposed. The Nyamagasani SHPs and the Kikagati SHP will be subject to these further reductions in the final subsidy amount.

Table 1 | Project Milestones Overview

No.	Project	Generation Licence	Developer Financing Agreement (DFA)	Power Purchase Agreement (PPA)	Financial Close	Construction Start	Commissioning[1]
1	Kakira	✓	✓	✓	✓	Q2 2012	**Q2 2014**
2	Kikagati	✓	✓	✓	✓	Q4 2017	**Q1 2021[2]**
3	Kyambura	✓	✓	✓	✓	Q3 2017	**Q3 2019**
4	Lubilia	✓	✓	✓	✓	Q1 2016	**Q2 2018**
5	Muvumbe	✓	✓	✓	✓	Q3 2015	**Q2 2017**
6	Ndugutu	✓	✓	✓	✓	Q2 2017	**Q4 2019**
7	Nkusi	✓	✓	✓	✓	Q2 2015	**Q2 2018**
8	Nyamagasani 1	✓	✓	✓	✓	Q1 2017	**Q4 2020**
9	Nyamagasani 2	✓	✓	✓	✓	Q1 2017	**Q2-Q3 2020**
10	Nyamwamba	✓	✓	✓	✓	Q4 2015	**Q2 2018**
11	Rwimi	✓	✓	✓	✓	Q3 2015	**Q4 2017**
12	Sindila	✓	✓	✓	✓	Q1 2017	**Q2 2019**
13	Siti I	✓	✓	✓	✓	Q1 2015	**Q2 2017**
14	Siti II	✓	✓	✓	✓	Q3 2016	**Q3 2019[3]**
15	Soroti	✓	✓	✓	✓	Q1 2016	**Q4 2016**
16	Tororo	✓	✓	✓	✓	Q1 2017	**Q3 2017**
17	Waki	✓	✓	✓	✓	Q2 2015	**Q4 2018**

[1] Whilst the Developer of the Kikagati SHP expects to commission all three generating units and achieve COD in Q4 2020, there is potential for COD to be delayed until early 2021. The completion of key project structures will, nonetheless, continue into 2021 and GET FiT estimates that construction works will not be completed until Q2-Q3 2021.
[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.
[3] Pending approval by GET FiT.

Portfolio Operating Performance in 2019

The timely implementation of new power evacuation infrastructure and upgrades to the existing grid continued to be a major issue for many of the projects. Of the 14 projects operating by the end of 2019, four SHPs had only partially completed their respective commissioning activities as a result of grid-related issues and had only achieved Deemed COD. In each case, improvements to the existing grid and/or the completion of new lines were required to enable completion of the full suite of commissioning tests and to enable power generation at full capacity, which were expected to be in place in 2020.

The availability of the plants to generate electricity during 2019 was generally in line with the expected range for a portfolio of new generation projects. Only three SHPs reported an availability of approximately 95 % - lower than would normally be expected - which was predominantly a result of isolated operating incidents or plant shutdowns, for example where remedial works were required to close out outstanding works or defects from the construction phase.

Otherwise, the availability and quality of the grid continued to affect the overall generation output, with resulting deemed energy obligations for GoU. Overall, 23 % of the planned generation from the portfolio failed to deliver due to grid related constraints. Except for the unusually high outages experienced by the Waki SHP and the lack of a dedicated power evacuation line at the Siti 2 SHP, the average deemed energy resulting from grid outages equated to approximately 11 % expected annual generation, painting a slightly less severe picture. The Siti 2 SHP, which achieved commercial operation during the second half of 2019, is still awaiting the completion of the interim connection solution, expected now during the first half of 2020, followed by the implementation of the permanent solution in 2021. As the ongoing enhancements to the grid continue in 2020, the overall grid outages and deemed energy obligations are expected to reduce substantially.

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 target 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. Nevertheless, adding an installed capacity of over 150 MW to the Ugandan electricity supply network is a significant achievement and truly reflects the successful impact of the GET FiT Programme.

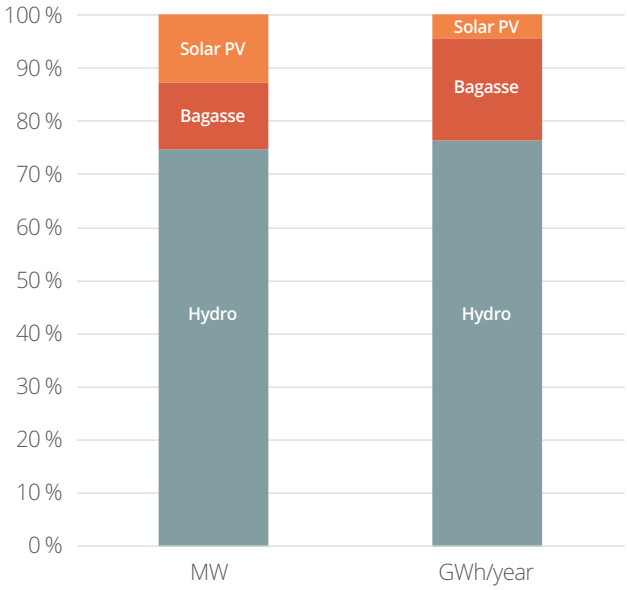
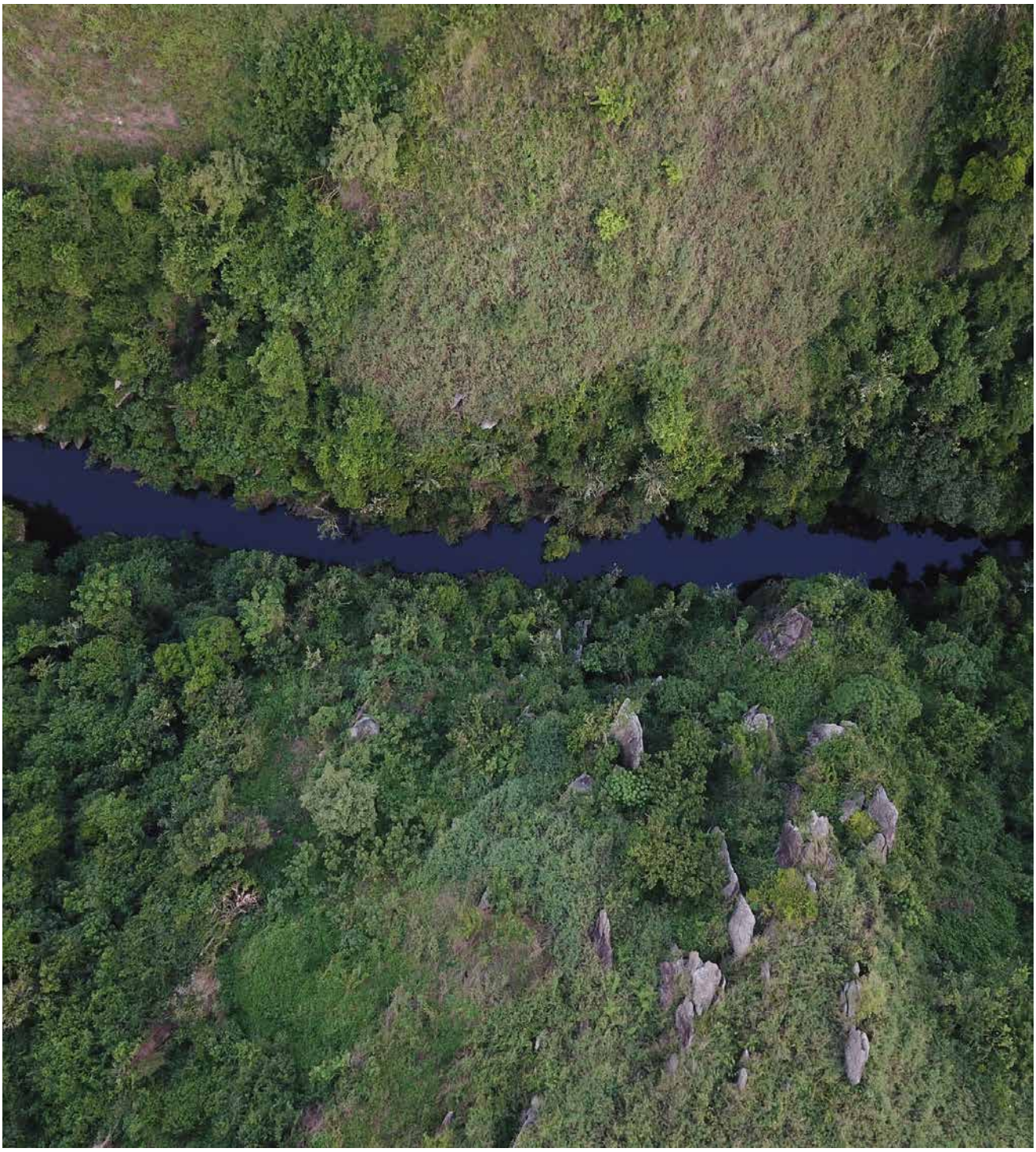


Figure 1 | GET FiT Portfolio Build Up

Figure 2 provides a schematic illustration of the merit order effect of the GET FiT portfolio at the end of 2019 (considering the current installed capacity of 122.4 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 14 % of total generation capacity has been added, thereby reducing generation from the heavy fuel oil plants in the country. Notably, the HPP Isimba commissioned this year, increased the installed capacity in the country by about 180 MW. In addition, the commissioning of the 600 MW Karuma hydropower project is expected in late 2020. This will increase the installed generation capacity by approximately 60 %. Based on ERA reporting, it is expected that consumers will face a significant excess generation in the short to medium term, and therefore incur deemed energy costs as a result of low demand.



Schematic Representation of Merit Order in 2019

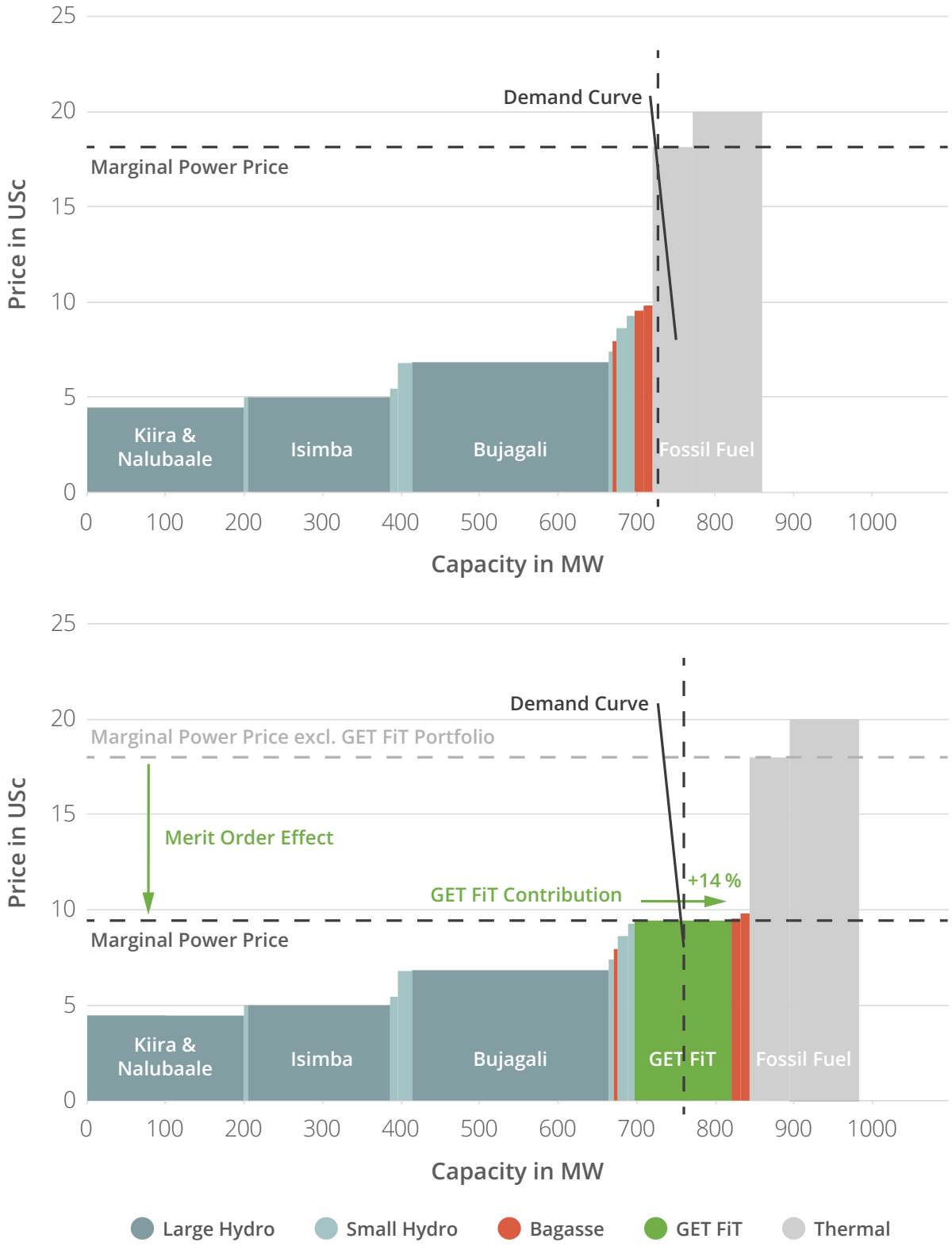


Figure 2 | Schematic Representation of Uganda's Merit Order with and without the GET FiT Portfolio

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, projects comprising the GET FiT portfolio are described in more detail, highlighting notable developments and power generation[4] in 2019. **Figure 3** provides an overview of the location of the respective projects of the portfolio.

Figure 3 | Map of GET FiT Portfolio

[4] 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.

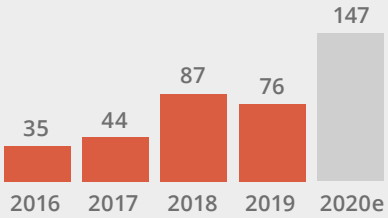
Kakira

Operational

Bagasse

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

Annual Generation (in GWh)



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. Since commissioning in 2015 the Project has been facing a low availability of sugar cane caused by increased local competition. The sugar cane supply improved during the past year, basically due to good weather and increased number of farmers. Kakira has also developed its own satellite cane fields to reduce dependency on the outgrower farmers to ensure constant raw materials supply for smooth operations. 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 and now 76 GWh in 2019. The project expects to gradually increase generation in the following years to approximately 105 GWh in 2020 and 130 GWh in 2021.

Kakira Sugar Limited has established a fund, contributing a fee per tonne of sugarcane delivered. It is now 11 years old and remains sustainable having spent over UGX 6.0 billion during the period. Its primary objective is to develop the social and physical infrastructure in the 35 km radius of the factory in the farmer communities. As such, the fund has a direct positive impact on the quality of life of all communities in the catchment area. Key activities include, among others, health units, science laboratories, safe drinking water and farmer loans.

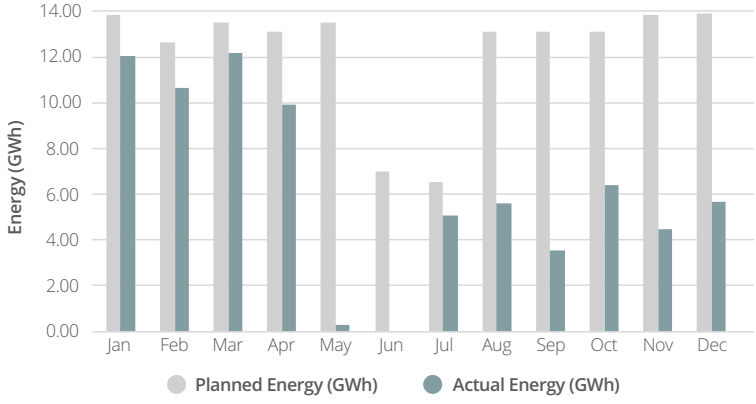


Figure 4 | Kakira Bagasse - Planned versus Actual Energy Output (2019)

Kyambura SHP

Operational

This run-of-river hydropower plant is located in the Rubirizi District in Western Uganda. The Developer initially mobilised to site in February 2017 but only commenced with key construction activities from September 2017.

Despite repeated occurrences of irresponsible construction practices during 2018, the Developer's performance improved substantially during 2019. Construction practices improved, restoration of damaged areas continued, and the general approach to resolving design and construction issues, as well as construction progress, was generally commendable. The Project successfully completed commissioning tests and synchronised to the grid in July 2019.

During the first five full months of operation (from August onwards), the Project delivered 15.5 GWh of electricity to the grid. Grid failures and external outages during the same period were approximately equivalent to 10 % of the potential plant output (energy delivered plus deemed energy). The plant availability during the corresponding period was approximately 99 %, which is in line with the upper end of the expected range for a new SHP.

Adjusting for the partial availability of the power evacuation line, the cumulative energy output of the plant during the first five full months of operation would have been 17.2 GWh, approximately equivalent to 96 % of the average energy for the same period of operation estimated at application stage.

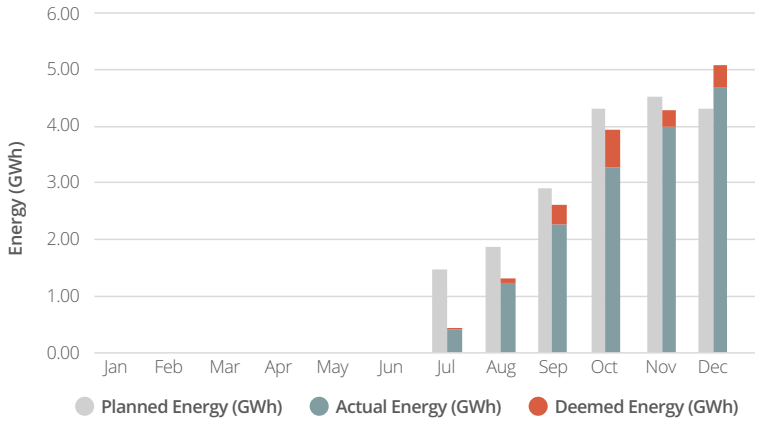


Figure 5 | Kyambura SHP - Planned versus Actual Energy Output (2019)

Hydropower

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

Annual Generation
(in GWh)

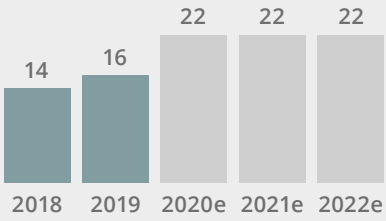
Lubilia SHP

Operational

Hydropower

Capacity (in MW)	5.4
Planned Generation (in GWh/year)	22.0
Total Investment (in million USD)	16.0
GET FiT Commitment (in million USD)	3.2

Annual Generation
(in GWh)



This run-of-river hydropower plant is located in Kasese District in Western Uganda and has been operational since early April 2018. In 2019 the Project delivered a total of 15.8 GWh of electricity to the grid.[5]

Grid failures and external outages during 2019 were approximately equivalent to 14 % of the potential plant output (energy delivered plus deemed energy), which is similar to the same level of outages experienced in the first nine full months of operation in 2018. The new transmission line under construction is expected to substantially reduce grid outages and improve grid reliability in 2020 following completion. Adjusting for the partial availability of the power evacuation line, the cumulative energy output of the plant during 2019 would have been 18.4 GWh, approximately equivalent to 84 % of the average annual energy estimated at application stage.

A post-COD site visit was undertaken to the site during November 2019. Documentation submitted by the Developer indicated that planned maintenance activities had generally been undertaken. Similar to the Siti 1 SHP, there appeared to be a serious non-compliance issue with operating phase permit conditions, relating to insufficient minimum flow release. The Developer's proposal for a revised release arrangement was accepted in principle, with installation of the alternative arrangement understood to be planned during early 2020.

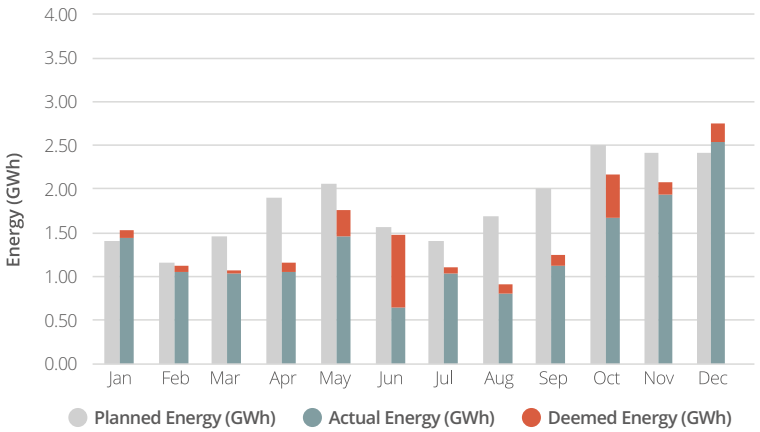


Figure 6 | Lubilia SHP - Planned versus Actual Energy Output (2019)

[5] The planned average annual generation of the Lubilia SHP has been adjusted from the 25 GWh reported in previous GET FiT Uganda reporting in order to reflect the expected plant output more accurately.

Muvumbe SHP

Operational

This run-of-river hydropower project is located in Kabale District in South-Western Uganda and has been operational since mid-May 2017.

During 2019, the Project delivered 28.9 GWh of electricity to the grid. Combined with the output generated since achieving COD in 2018, the Project has so far delivered a total of 69.6 GWh to the Ugandan grid.

Grid failures and external outages were approximately equivalent to 9 % 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 would instead have been 31.6 GWh, approximately equivalent to 101 % of the average energy estimated at application stage.

Following a post-COD site visit undertaken to the site during 2018 and subsequent follow-up communications with the Developer, the Developer proposed modifications to the intake structures during 2019 to ensure compliance with operating phase permit conditions, in particular the continuous release of the minimum flow requirement. The Developer's proposal for a revised release arrangement was accepted in principle, with installation of the alternative arrangement understood to be planned during early 2020 after detailed plans having been presented to GET FiT for acceptance. Some further environmental and social compliances issues also required corrective actions.

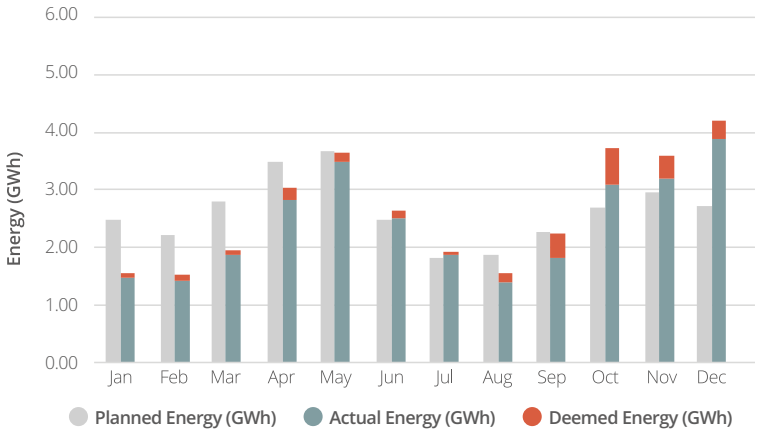
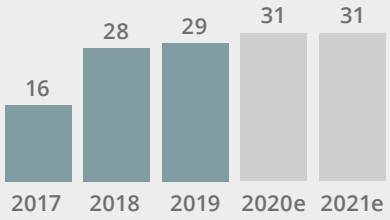


Figure 7 | Muvumbe SHP – Planned versus Actual Energy Output (2019)

Hydropower

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

Annual Generation
(in GWh)



Ndugutu SHP

Operational

Hydropower

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

Annual Generation
(in GWh)

This run-of-river hydropower plant is located in the Bundibugyo District in Western Uganda and was developed in parallel with the Sindila SHP, located on an adjacent river basin (also approved for GET FiT support). The Project commenced construction in June 2017 and achieved Deemed COD on 1 October 2019.

During the first three full months of operation (from October onwards), the Project delivered 4.8 GWh of electricity to the grid. Grid availability reported during the same period averaged approximately 87 %.

Reinforcements to the existing grid and construction of a new power evacuation line to the Fort Portal substation were ongoing during 2019. These efforts are expected to substantially reduce outages and allow both Ndugutu and the neighbouring Sindila SHP to complete outstanding commissioning tests and to evacuate at full capacity to the grid. In the interim, improvements were implemented during Q3 to improve the capacity of the existing grid to circa 8 MW, enabling both the Sindila and Ndugutu SHPs to generate and supply electricity.

Since the Ndugutu SHP achieved COD, it is understood that the combined output of the Sindila and Ndugutu SHPs had been restricted to approximately 7.5 MW, to minimise tripping of the power plant, which was shared between the projects depending on the availability of flows.

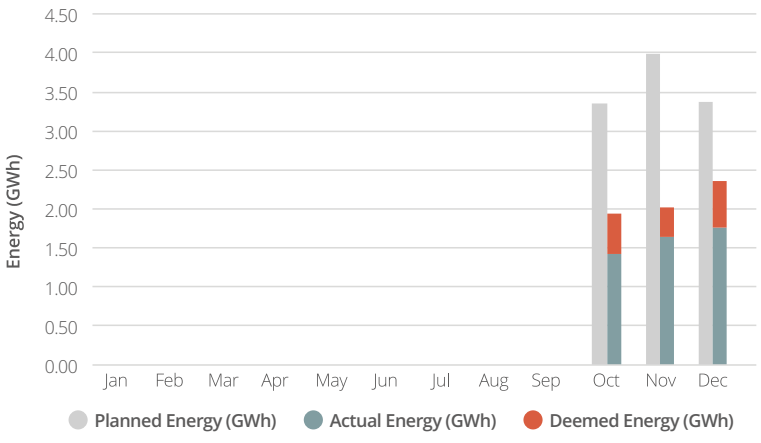


Figure 8 | Ndugutu SHP - Planned versus Actual Energy Output (2019)

Nkusi SHP

Operational

This run-of-river hydropower plant is located in the Kibaale and Hoima Districts in Western Uganda and has been operational since mid-June 2018.

During 2019, the Project delivered 43.8 GWh of electricity to the grid. Combined with the output generated since achieving COD in 2018, the Project has so far delivered a total of 73.1 GWh to the Ugandan grid.

Grid failures and external outages during 2019 were approximately equivalent to 24 % of the potential plant output (energy delivered plus deemed energy), a marginal improvement on the 28 % of outages reported in 2018. The availability of the plant to generate during 2019 was generally within acceptable limits at an average of 96 %.

Adjusting for the partial availability of the power evacuation line, the cumulative energy output of the plant during 2019 would instead have been 57.4 GWh, approximately equivalent to 125 % of the average annual energy estimated at application stage.

The construction of an alternative power evacuation route towards Hoima was completed in July 2019. This enhanced the network's robustness and reduced the outages and the deemed energy risk to GoU.

A post-COD visit has not yet been undertaken. Meanwhile, follow-up of outstanding issues at the time of COD is undertaken on a desk review basis.

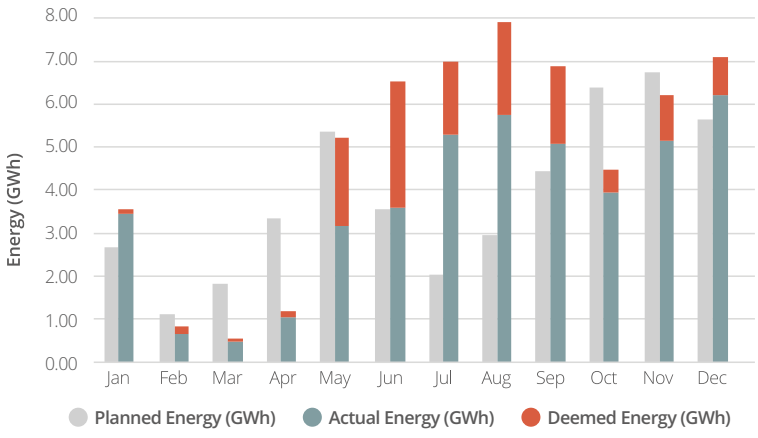
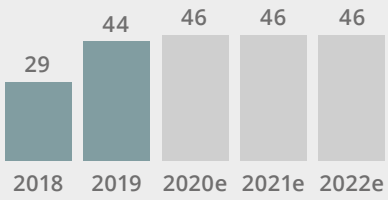


Figure 9 | Nkusi SHP - Planned versus Actual Energy Output (2019)

Hydropower

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

Annual Generation
(in GWh)



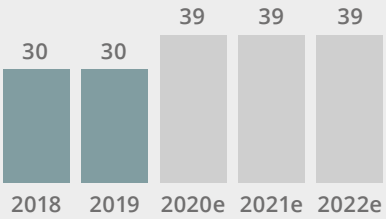
Nyamwamba SHP

Operational

Hydropower

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

Annual Generation (in GWh)



This run-of-river hydropower plant is located in Kasese District in Western Uganda and has been operational since the end of April 2018.

During 2019, the Project delivered 29.6 GWh of electricity to the grid. Combined with the output generated since achieving COD in 2018, the Project has so far delivered a total of 60.0 GWh to the Ugandan grid.

Grid failures and external outages were approximately equivalent to 13.7 % of the potential plant output (energy delivered plus deemed energy). Adjusting for partial availability of the power evacuation line, the cumulative energy output of the plant during 2019 would instead have been 34.3 GWh, approximately equivalent to 88 % of the average energy estimated at application stage.

Notably, the ownership of the project changed in 2019 from SAEMS LLC to responsAbility Renewable Energy Holding (rAREH). Africa EMS Nyamwamba Ltd. will continue to operate the plant.

A post-COD visit has not yet been undertaken. Meanwhile, follow-up of outstanding issues at the time of COD is undertaken on a desk review basis.

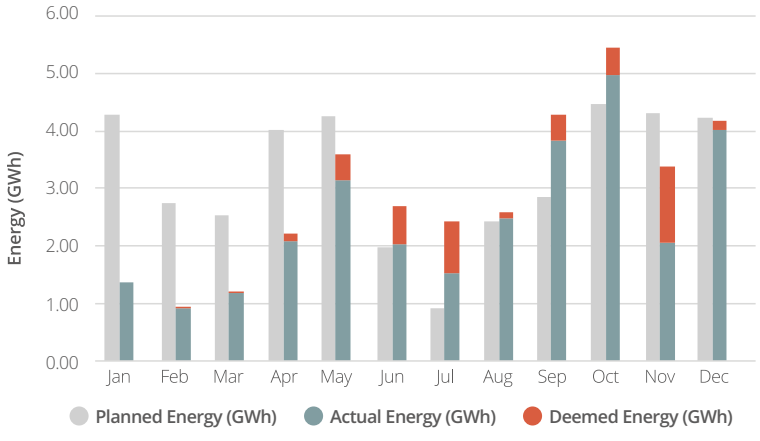


Figure 10 | Nyamwamba SHP - Planned versus Actual Energy Output (2019)

Rwimi SHP

Operational

This run-of-river hydropower project is located in Kasese and Bunyangabo Districts in Western Uganda and has been operational since October 2017. During 2019, the Project delivered 25.1 GWh of electricity to the grid.

Works to remedy residual defects from the construction stage were undertaken during 2019. Excluding scheduled maintenance works the plant availability would have been more than 99 % which is in line with the upper end of the expected range for a new SHP.

Grid failures and external outages during 2019 were approximately equivalent to 2 % of the potential plant output. Adjusting for the partial availability of the power evacuation line and downtime due to the rectification of construction defects, the energy output of the plant would instead have been 26.0 GWh, approximately equivalent to 97 % of the average annual energy estimated at application stage, well within the expected deviation of an average hydrological year.

A post-COD site visit was undertaken to the site during November 2019. Operational issues reported during the period were understood to have been rectified. The Project was requested to address outstanding environmental and social compliance issues related to operations.

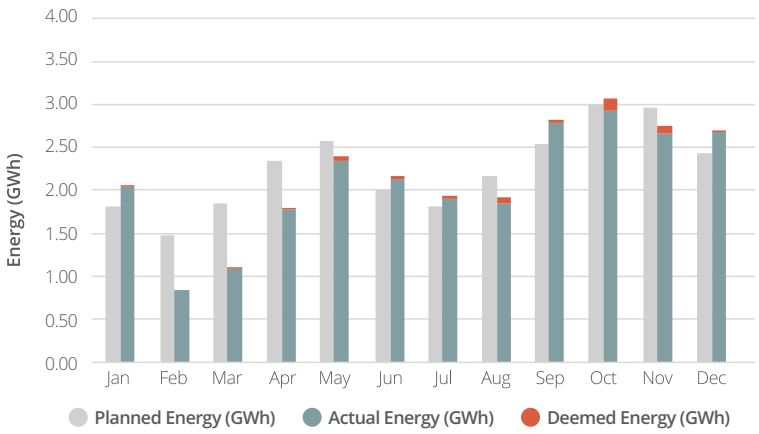


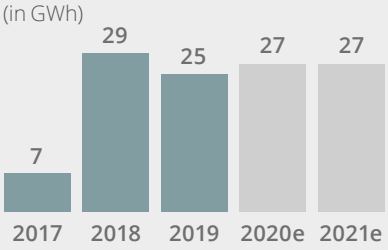
Figure 11 | Rwimi SHP - Planned versus Actual Energy Output (2019)

[6] At the time of project approval, the Project was located in Kasese and Kabarole Districts. Since 1 July 2017, the area on the left bank is in Bunyangabo District following the split of Kabarole District into multiple districts.

Hydropower

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

Annual Generation
(in GWh)



Sindila SHP

Operational

Hydropower

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

Annual Generation (in GWh)

This run-of-river hydropower plant is located in Bundibugyo District in Western Uganda and was developed in parallel with the Ndugutu SHP, located on an adjacent river basin (also approved for GET FiT support). The Project commenced construction in February 2017 and synchronised to the grid during April 2019. The plant was unable to complete the full suite of commissioning tests, however, due to constraints with the existing grid, and achieved Deemed COD on 1 May 2019. GET FiT formally acknowledged the achievement of COD in September 2019 following the completion of key Project structures and demonstrating compliance with permit requirements.

During the first eight full months of operation (from May onwards), the Project delivered 9.1 GWh of electricity to the grid. Grid failures and external outages during the same period were approximately equivalent to 17 % of the potential plant output, which reflects issues encountered with the capacity and reliability of the existing grid. Reinforcements to the existing grid and construction of a new power evacuation line between the Sindila and Ndugutu SHPs and Fort Portal are expected to substantially reduce grid outages moving forward. As indicated earlier in this report, reinforcements to the existing grid and construction of a new power evacuation line between the Sindila and Ndugutu SHPs and Fort Portal are expected to substantially reduce grid outages moving forward. Adjusting for the partial availability of the power evacuation line, the energy output of the plant during the first eight full months of operation is equivalent to approximately 57 % of the average energy for the same period of operation estimated at application stage.

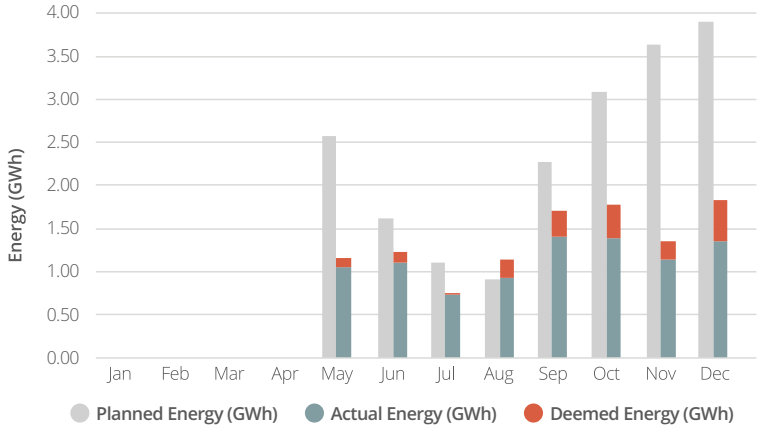


Figure 12 | Sindila SHP - Planned versus Actual Energy Output (2019)

Siti 1 SHP

Operational

This run-of-river hydropower plant is located in Bukwo District in Eastern Uganda and has been operational since May 2017. During 2019, the Project delivered 20.1 GWh of energy to the grid.

Substantial grid failures and outages continued throughout 2019 with grid availability reportedly as low as 59 % on average. Lost generation due to grid failures and outages, accounting for water availability, equated to approximately 23 % of the potential plant output, which is especially high and similar in magnitude to the 26 % reported in 2018. The long-term power evacuation solution for the Siti 1 SHP and downstream Siti 2 SHP comprises a new 132 kV transmission line between Mbale and Bulambuli, which is expected to substantially improve the availability and 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 energy output of the plant during 2019 would have been equivalent to 104 % of the average energy estimated at application stage.

A post-COD site visit was undertaken to the site during September 2019. A serious non-compliance with operating phase permit conditions was identified, relating to a persistent, insufficient minimum flow. The Developer's proposal for a revised release arrangement was accepted in principle and installation was reportedly completed in early 2020.

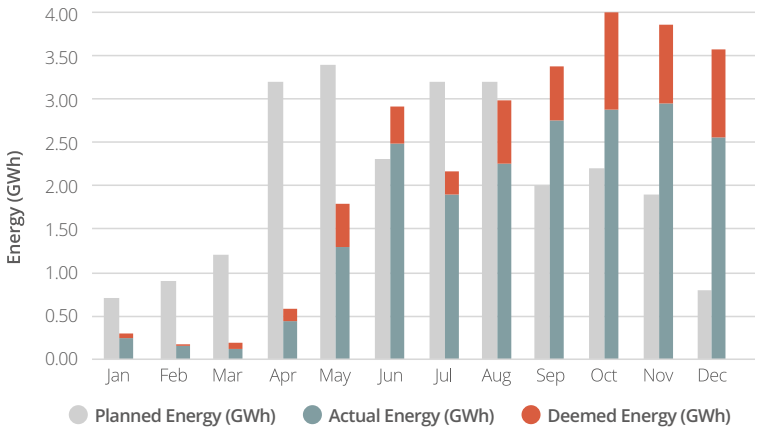
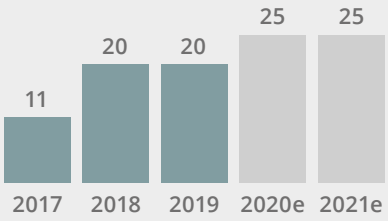


Figure 13 | Siti 1 SHP - Planned versus Actual Energy Output (2019)

Hydropower

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

Annual Generation
(in GWh)



Siti 2 SHP

Operational

Hydropower

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

Annual Generation
(in GWh)

This run-of-river hydropower plant is located in Bukwo District in Eastern Uganda. The Project commenced construction in August 2016 and completed partial commissioning tests and synchronised to the grid in July 2019.

The Project is currently connected to the grid via the adjacent Siti 1 SHP power evacuation line, which has very limited capacity. As a result, Siti 2 has only delivered 1.7 GWh to the grid in the first five full months of operation, with deemed energy claims accounting for 95 % of the potential plant output during the same period.

The long-term power evacuation solution is a new 132 kV transmission line planned between Mbale and Bulambuli, not expected to be complete before 2021. In the interim, a 125 km long 33 kV line is being constructed following the existing Siti 1 SHP line, though implementation of this line is also delayed.

Despite synchronising to the grid, the Project had not completed essential commissioning tests within the constraints of the grid by the end of 2019 and there were further substantial environmental non-compliances outstanding.

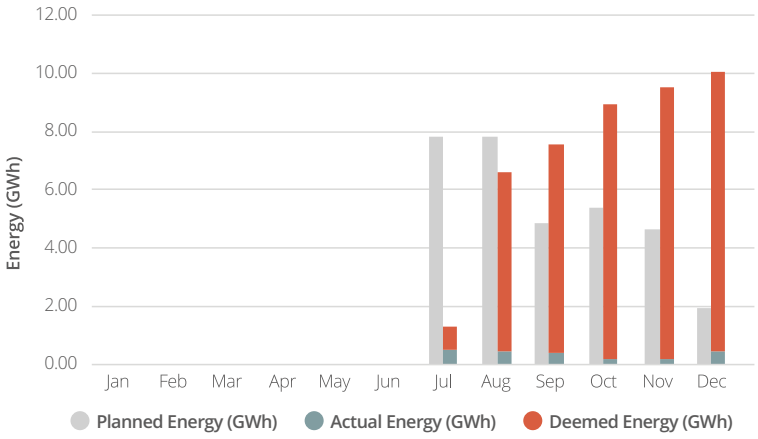


Figure 14 | Siti 2 SHP - Planned versus Actual Energy Output (2019)

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 three years. At the beginning of its commercial operation the 10 MW plant was the first grid-connected Solar PV Power Plant in Uganda and also East Africa's largest.

In 2019, the plant produced approximately 16.0 GWh. The deemed energy due to failures from the grid was 1.24 GWh, meaning that the plant could have produced and delivered circa 17.2 GWh to the grid, given no grid failure. The local Operation and Maintenance team 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.

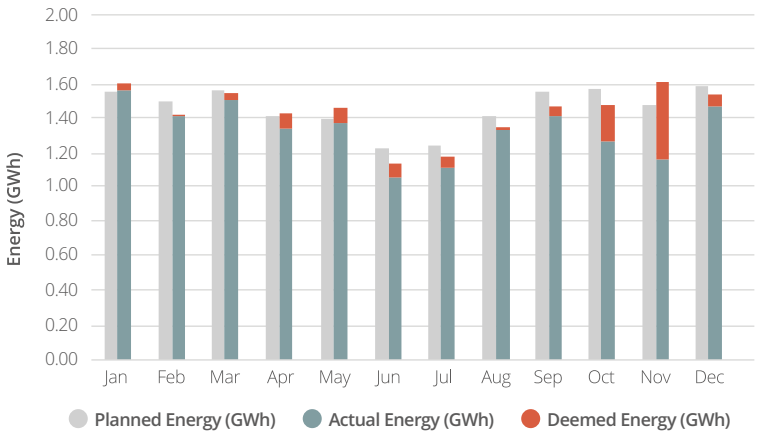
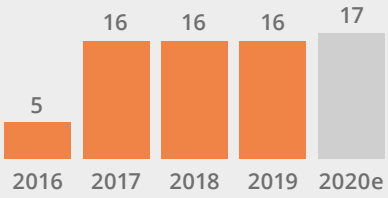


Figure 15 | Soroti Solar PV - Planned versus Actual Energy Output (2019)

Solar PV

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

Annual Generation (in GWh)



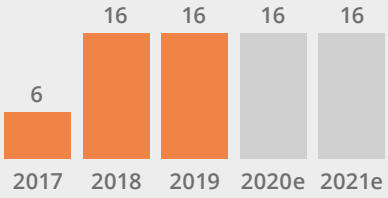
Tororo Solar PV

Operational

Solar PV

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

Annual Generation (in GWh)



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

The facility operated to expected and forecasted performance levels and there have been no major issues or concerns during the first two operational years. The Project has not reported any deemed energy in 2019. Total generation during the year equalled approximately 16.0 GWh, in line with the planned annual generation.

The owners, Tororo Solar North Ltd., part of the Building Energy Group, has built an Early Childhood Development Centre which has been available for use by the local community since December 2018.

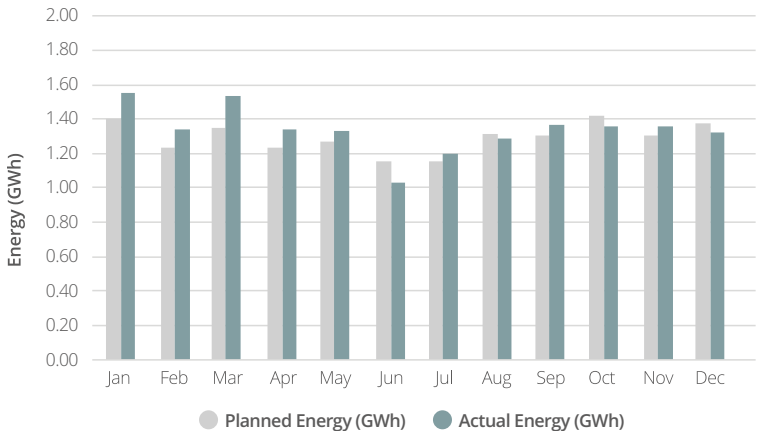


Figure 16 | Tororo Solar PV – Planned versus Actual Energy Output (2019)

Waki SHP

Operational

This run-of-river hydropower plant is located in Hoima and Buliisa Districts in Western Uganda and has been operational since December 2018.

During 2019, the Project delivered 13.0 GWh of electricity to the grid. Grid availability during 2019 was very poor, averaging approximately 76 %. The approximate resulting deemed energy was equivalent to 48.3 % of the potential plant output (energy delivered plus deemed energy). Please refer to Chapter 4 for further details on grid-related challenges experienced at the Project. Adjusting for partial availability of the power evacuation line, the cumulative energy output of the plant during 2019 would instead have been 25.1 GWh, approximately equivalent to 102.3 % of the average energy estimated at application stage.

Despite achieving Deemed COD in 2018, the Developer was not able to demonstrate the safe and reliable performance of the forebay spillway to the satisfaction of GET FiT. Consequently, following several unsatisfactory modifications to the arrangement between November 2018 and July 2019, the forebay was converted into a surge tank, thereby eliminating the need for the spillway. The modifications were completed by the end of September 2019 and GET FiT formally acknowledged the achievement of Deemed COD in October 2019.

A post-COD visit has not yet been undertaken. Meanwhile, follow-up of outstanding issues at the time of COD is undertaken on a desk review basis. This has included corrective measures regarding the release and monitoring of the minimum flow.

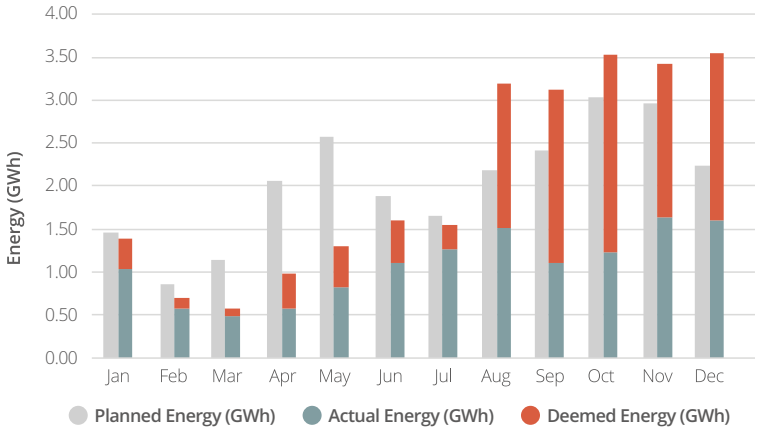
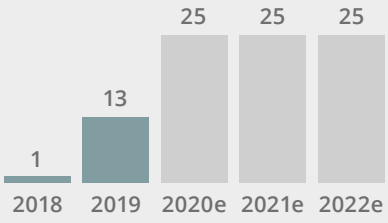


Figure 17 | Waki SHP - Planned versus Actual Energy Output (2019)

Hydropower

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

Annual Generation
(in GWh)



Kikagati SHP

Under Construction

Hydropower

Capacity (in MW)	16.0
Planned Generation (in GWh/year)	115.0
Total Investment (in million USD)	88.0
GET FiT Commitment (in million USD)	12.3

This run-of-river hydropower plant is located in Isingiro District in Southern Uganda on the Kagera River representing the border with Tanzania. Following the replacement of the EPC Civil Contractor in the latter half of 2018, the Contractor completed mobilisation activities, including establishment of the site facilities such as the compound and accommodation blocks where construction had continued under management by the Developer during the EPC replacement process. The EPC Civil Contractor was finally awarded a Full Notice to Proceed in August 2019, despite construction activities having progressed in the meantime.

Blasting and excavation of the powerhouse foundations, which comprised substantial volumes of material as a result of the powerhouse previously being shifted slightly further inland, was completed during 2019 and construction of the reinforced concrete foundations and walls had commenced. Several months of delay were encountered in constructing the powerhouse, however, as a result of resolving design issues between the EPC Contractor and Owner's Engineer. Night-working shifts had been introduced in an attempt to recover programme delays. Construction works on the Tanzanian side had not yet commenced.

Further design modifications and optimisations to the dam and fish pass arrangements were considered throughout 2019, with details of the revised proposals being submitted and discussed as late as the site visit in November 2019. Key design issues were still to be resolved by the end of the year, although progress against key issues had been achieved.

The Developer planned for the three units to be commissioned progressively, with an estimated contract COD in September 2020 and construction completion in March 2021. Based on observed progress, outstanding design issues, the scope of remaining construction works, and substantial construction risks such as being able to successfully divert the Kagera River, there is potential for COD to be delayed until early 2021 and for contract completion to be delayed until Q2-Q3 2021. Harmonisation and continued coordination with respect to requirements in the two countries is likely to be essential to avoid further unexpected delays, in particular as construction works expand to the Tanzanian side in 2020.

Nyamagasani 1 SHP

Under Construction

This run-of-river hydropower plant is located in the Kasese District in Western Uganda. The Developer mobilised to site in February 2017 and only issued the EPC Contractor with a full Notice to Proceed at the end of 2017. At the end of the following year, 2018, the Project still faced substantial challenges in a few key locations across the site and a number of key design decisions remained unresolved, despite having initially achieved design freeze in Q1 2018.

The first few hundred metres of headrace waterway in steep terrain, downstream of the weir and intake, remained the most challenging section of the Project in 2019. A landslide in this location at the start of the year exacerbated the slow progress, and ultimately resulted in a major design change. Notable progress in resolving Project designs was finally achieved by the middle of 2019. Nonetheless, last year was characterised by generally poor construction progress, which was understood to be predominantly a result of the Contractor being overstretched. By the end of 2019, the Developer had agreed with the Contractor to implement measures that were expected to improve progress.

By the end of 2019, access to the weir was still limited and construction progress at the weir and first few hundred metres of waterway were limited. Based on the substantial volume of construction works remaining and the potentially substantial risks and uncertainties to completion, the Developer's planned commercial operation date at the end of April 2020 appeared highly unlikely. A COD of Q4 2020 appears more realistic.

Construction of the new 33 kV power evacuation line, being implemented by the Rural Electrification Agency, also remained a critical risk to the Project with substantial delays experienced during 2019. Completion of the line was not anticipated until Q3 of 2020.

Hydropower

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

Nyamagasani 2 SHP

Under Construction

Hydropower

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

This run-of-river hydropower plant is located in the Kasese District in Western Uganda and was developed as part of a cascade, just downstream of the Nyamagasani 1 SHP (also approved for GET FiT support). The Developer and EPC Contractor are common to both the Nyamagasani 1 and 2 SHPs and, similar to the Nyamagasani 1 SHP, observed construction progress during 2019 was generally poor, the resolution of design issues continued into 2019, and there were substantial delays to the planned COD.

By the end of 2019, key design decisions had been resolved, including the fish passage arrangement at the weir and the planned COD had been revised to early March 2020. Despite the site being less challenging from an access and construction perspective, compared with the upstream Nyamagasani 1 SHP, as well as being more advanced, there were still considerable remaining construction works and risks to completion. A COD of Q2-Q3 2020 appears more realistic.

As for the Nyamagasani 1 SHP, the timely implementation of the new 33 kV power evacuation line, which is common to both projects and expected to be completed only in Q3 2020, represents a major ongoing risk to the Project.

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. GET FiT supervision visits to projects show that risk management affects a project developer's social licence to construct and operate, that is, affects the project's social acceptance within the project communities and among other stakeholders. Such acceptance guards against a variety of social risks during construction and operation and saves costs in the long run, for instance costs for security, maintenance, repairs and losses due to theft.

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. In 2019, GET FiT observed that several international lenders and owners did not ensure compliance with national and international E&S standards. This has increased the supervision efforts and follow-up by GET FiT. It is important to note that the Ugandan regulations and the IFC PS have many similarities with further similarities added with the approval of Uganda's 2019 National Environment Act that replaced the National Environment Act, 1995. One important difference remains concerning compensation for loss of assets during displacement. The international standards require full replacement cost (market value + transaction costs) rather than Uganda's requirement of using the lower depreciated value. Multiple projects have been required to increase compensation from the rates approved nationally to ensure fair compensation.

3.2 GET FiT Follow-Up and Support

As highlighted in previous GET FiT Annual Reports, the capacity of developers 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. Few project 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 Request for Proposals (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). Cumulatively across the portfolio to date, approximately 83 % of the environmental and social CPs have been cleared.

As in previous years, GET FiT spent considerable resources reviewing and advising developers on E&S issues in 2019. While the number of projects under construction reduced, E&S compliance issues associated with operations were uncovered particularly regarding inadequate releases of minimum flows. Labour and working conditions including health and safety on construction sites, managing additional land acquisition during construction and ensuring fair compensation, appropriate hazardous waste management, minimising damage during excavations and management of indirect adverse impacts on important biodiversity areas like national parks continued to be important issues in 2019. Progress was recorded on multiple issues as project developers gained experience.

A total of 23 project visits to ten (10) projects were undertaken in 2019 including 16 project supervision visits, four (4) COD visits, and three (3) post-COD visits. 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. The supervision visits comprise a one-day visit per project with subsequent provision of a supervision visit report for each visit. KfW participated in all site visits in 2019 and the Electricity Regulatory Authority (ERA) participated in approximately half of the visits in addition to separate visits undertaken by ERA as the regulator for all projects. The joint visits continued to prove very useful. For some of the projects, GET FiT also shared observations from visits with lenders.

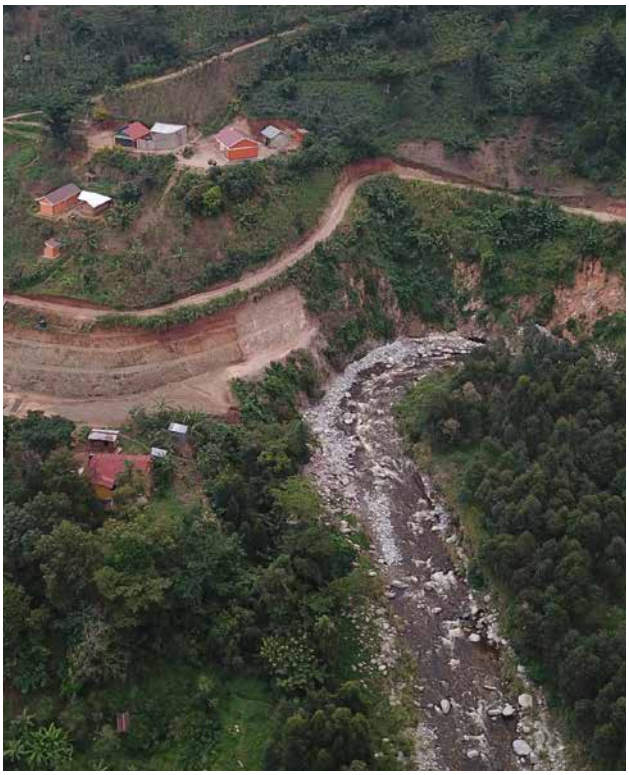
3.3 Improvements and Remaining Challenges

Most projects under construction in 2019 saw improvements in environmental and social performance and several project developers continued to gain experience and improve capabilities in managing environmental and social risks. Additional GET FiT follow-up and advice, notifications of potential subsidy reductions and GET FiT not providing COD payments until improvements in compliance were undertaken, all contributed to more decisive actions by project developers to close key gaps in environmental and social compliance. As a result of the GET FiT Programme, there is now a considerably higher degree of compliance with Ugandan regulations and international standards than would otherwise have been observed, greater capacity among developers, and this has resulted in substantially improved safeguarding of people and nature in project areas.

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 2019 but has gradually reduced. For some projects, legal proceedings against developers and contractors due to construction damage and claims of compensation are still ongoing while others were closed in 2019. Some of the cases have merit, others appear speculative.

Developers' monitoring of E&S issues during construction and operations remained a weakness in multiple projects, and resource-constrained Ugandan government lead agencies were not able to completely fulfil their intended roles in monitoring compliance. GET FiT uncovered that multiple projects have not released the required minimum flow with adverse impacts on people and ecosystems. Such unacceptable practices required immediate corrective measures, which have not always been forthcoming. GET FiT works with ERA to address these non-compliances and develop guidance for future follow-up of environmental flow releases.

Challenges continued to be observed in the transition from the construction phase team to the operations phase team including ensuring adequate hand-over and institutionalising local knowledge and understanding of sensitive issues. It was positive to note that some projects retained one of the environmental and social officers from the construction phase, and this person plays an important role in community liaison as operations phase issues arise, for instance grievances.



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. Two projects experienced subsidy reductions in 2018 due to serious non-compliances that were not adequately addressed during the cure period. No construction stops were requested and no further subsidy reductions due to serious E&S non-compliances were issued in 2019 but subsidy payments were postponed because of such non-compliances.

A limited number of projects still had substantial non-compliances related either to construction or operations at the end of 2019 and will likely face actions by GET FiT in 2020. The serious non-compliances will be followed up by GET FiT in 2020 in order to find workable solutions.

04 Grid Connection Status and Challenges

The Government of Uganda, in cooperation with development partners, has made significant progress in reinforcing grid infrastructure for the integration of renewable energy projects during 2019. These efforts will eventually result in more reliable transmission and distribution networks across the board. However, considerable work remains in order to adequately evacuate power from operational projects and establish new lines for projects under construction. Several interventions are already underway.

4.1 Operational Projects

Four additional projects (Kyambura, Ndugutu, Sindila, and Siti 2) were connected and synchronised to the Ugandan national grid in 2019 following successful commissioning tests by UETCL. Kyambura had proximity to an existing 33 kV distribution grid and faced fewer grid connection challenges. However, Siti 2, Sindila and Ndugutu experienced inadequate or unreliable power evacuation and registered significant deemed energy claims at the end of 2019.

Figure 18 shows the planned, actual and deemed energy outputs of the GET FiT portfolio projects in 2019 (left axis). It also shows the percentage of deemed energy relative to total potential generation (right axis). As seen in the figure, five projects had deemed energy levels of more than 20 percent. Notably, Siti 2 SHP barely delivered electricity during its first months of operations (since August 2019), as the required transmission line was still under construction. This, together with the unreliable connection experienced at Waki SHP, contributed towards the high portfolio average of 22 %.

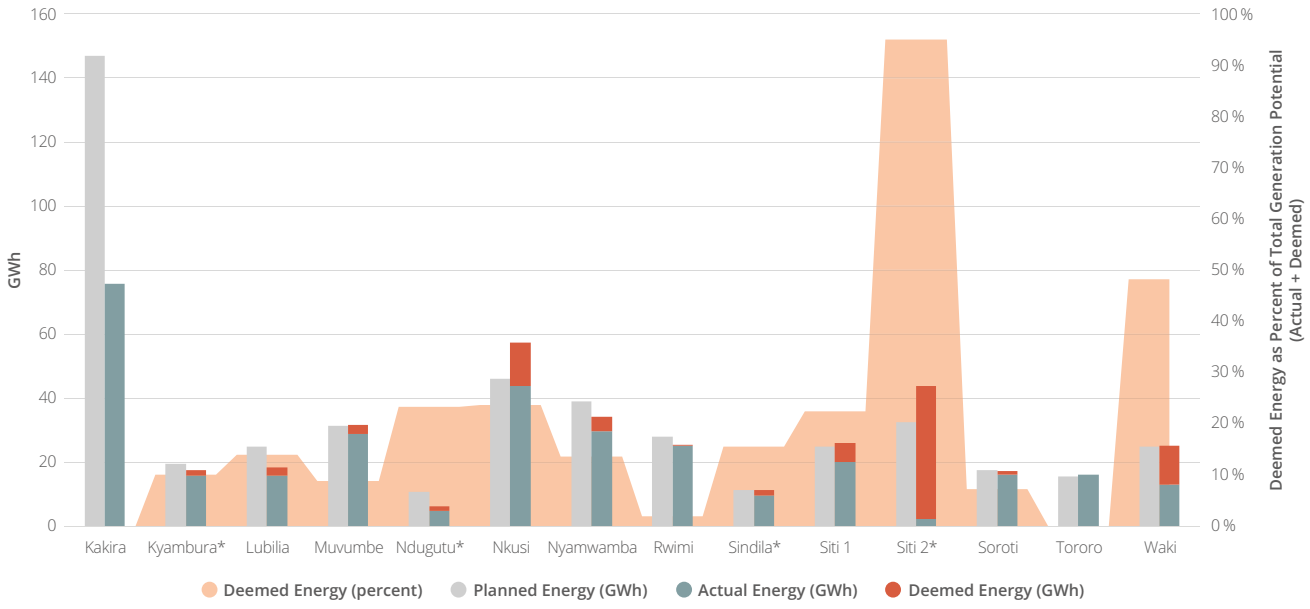


Figure 18 | Planned, Annual and Deemed Energy Generation from GET FiT Projects in 2019

* Kyambura, Ndugutu, Sindila, and Siti 2 were commissioned during the year and their planned generation is shown for operational months only.

As seen in **Figure 18**, there is a wide variation in the reliability of power evacuation among commissioned projects that require a dedicated follow-up. 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 2019 are highlighted below.

Siti 2 SHP

Since commissioning, Siti 2 SHP (16.5 MW) has been marginally evacuated through a 33 kV connection via the neighbouring Siti 1 SHP (6.1 MW). The evacuation through Siti 1 was an interim measure only to enable commissioning of the plant; it does not allow for proper operation of Siti 2. To this end, a new 125 km (33 kV) line to Mbale substation is being constructed by distribution grid operator Umeme (tasked by GoU) to enable higher production levels at Siti 2. Due to poor planning at GoU level, construction of the new line started too late and was not yet completed by the end of 2019. Consequently, the project has registered deemed energy levels at 95 % since commissioning.

As at the end of 2019, the new line was in the advanced stages of construction with poles erected and line stringing ongoing. It is expected to be commissioned in Q1 2020. KfW and the GET FiT Secretariat continue to engage with all stakeholders towards expediting the line's implementation.

Sindila and Ndugutu SHPs

The Sindila (5.3 MW) and Ndugutu (5.9 MW) SHPs in Bundibugyo were commissioned and declared ready for synchronisation to the national grid in February and October 2019 respectively. Both projects are connected to the grid through a new 4.8 km 33 kV line from the projects' switchyards to the existing grid at Bubandi for evacuation towards Fort Portal. The existing grid connection is not adequate to evacuate both projects at full generation capacity.

REA is constructing a new 104 km 33 kV line from Bubandi to Fort Portal with funding from the UK Department for International Development (DFID) through GET FiT to adequately evacuate both projects. The line construction has been delayed and is expected to be completed during 2020. GET FiT will continue to engage with GoU, the Implementation Consultant and Contractors to ensure that the implementation of the line is expedited.

Waki SHP

Since it's commissioning in December 2018, Waki has faced challenges achieving full power evacuation due to several technical constraints on the project area grid. The project is connected to the Hoima – Bulindi – Waki 33 kV distribution line. The technical problems identified on this line following an inspection by the developer in 2018 included faulty insulators, old poles, faulty transformers and inadequate earthing and line protection in parts. Uganda Electricity Dis-

tribution Company Limited (UEDCL) undertook several interventions to improve the line, including line clearances, improved protection scheme through installation of jumpers, dropout fuses and an auto-recloser, and the installation of transformers.

However, the project continued to face grid challenges during 2019. Key among these, as reported by the developer, were frequent tripping of the line especially during the night and in the rains, with delayed response from UEDCL to rectify the faults; earth faults and poor line clearances along certain line segments; inadequate line protection including faulty fuse dropouts and load break switches; rotten and leaning electricity poles; faulty transformers; and lack of effective communication with the UETCL SCADA system so that the auto-recloser cannot be remotely controlled after a trip.

A technical team with representation from ERA, UEDCL, Umeme, REA and the developer was constituted to oversee continued interventions on the grid aimed towards full evacuation of the project.

Nkusi SHP

The evacuation of Nkusi SHP has also experienced several challenges since the project's commissioning in 2018. The project's generation was capped to 4 MW, out of 9.6 MW, in early 2019 due to high losses (>50 %) reported by UEDCL in wheeling generated power from the project through its distribution network to the UETCL substation in Fort Portal.

In order to mitigate the network losses and improve the project's power evacuation, the System Planning and Coordination Committee (SPCC) comprising UETCL, ERA, UEDCL, REA, UEGCL, Umeme and the developer carried out technical simulations in 2019 to establish the cause of losses and recommend necessary interventions.

The SPCC confirmed that the network losses were over 50 % and determined that the construction of additional lines to provide alternative power evacuation routes towards Hoima, and splitting of the Nkusi SHP plant into two units evacuated separately would reduce the network losses by 50 % and mitigate deemed energy. The developer constructed an additional 17.7 km evacuation line in 2019 with a grant from NORAD and handed the lines over to UEDCL in July 2019. The developer also added switches and did line repairs during the construction phase. The proposal to split the 9.6 MW plant into 2 x 4.8 MW for respective evacuation was submitted to ERA for approval. In the interim, the generation cap was raised to 6 MW.

To provide a long-term solution for the evacuation of Nkusi and planned hydropower projects in the area, REA plans to construct a new 33/132 kV substation at Muzizi and dedicated 33 kV lines from the project to the substation. The timeline for the commencement of works and commissioning of the substation is not confirmed.

4.2 Projects under Construction

The three projects still under construction have widely varying risks of timely power evacuation. The 16 MW Kikagati SHP has the lowest risk because the evacuation line was already constructed by REA. Nyamagasani 1 and 2, however, have the highest risk as explained below.

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

No.	Project	Capacity (MW)	Expected COD	Status*	Deemed Energy Risk
1	Nyamagasani 1	15.0	Q4 2020	Delayed. Line to be expedited by REA.	**High**
2	Nyamagasani 2	5.0	Q2-Q3 2020	Delayed. Line to be expedited by REA.	**High**
3	Kikagati	16.0	Q1 2021	Completed. Line built by REA.	**Low**

*Status as of 31.01.2020

Nyamagasani 1 and 2 SHPs

Construction of a joint 55 km 33 kV line to evacuate power from both Nyamagasani 1 SHP (15 MW) and Nyamagasani 2 SHP (5 MW) to Nkenda 132/33 kV substation in Kasese is being implemented by REA. An EPC contractor was procured by REA in August 2018 but construction of the line is yet to commence due to extended delays caused by high compensation costs. The lines are expected to be commissioned in Q4 2020. With Nyamagasani 2 (5 MW) currently expected to be commissioned in Q2-Q3 2020, 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 have a high risk of deemed energy obligations to GoU if critical grid reinforcements are not implemented in a timely manner. Multiple interventions are ongoing, which are presented in the following section. An overview of key ongoing grid investments that are funded by GET FiT, or relevant to the GET FiT portfolio, is provided in **Figure 19.**

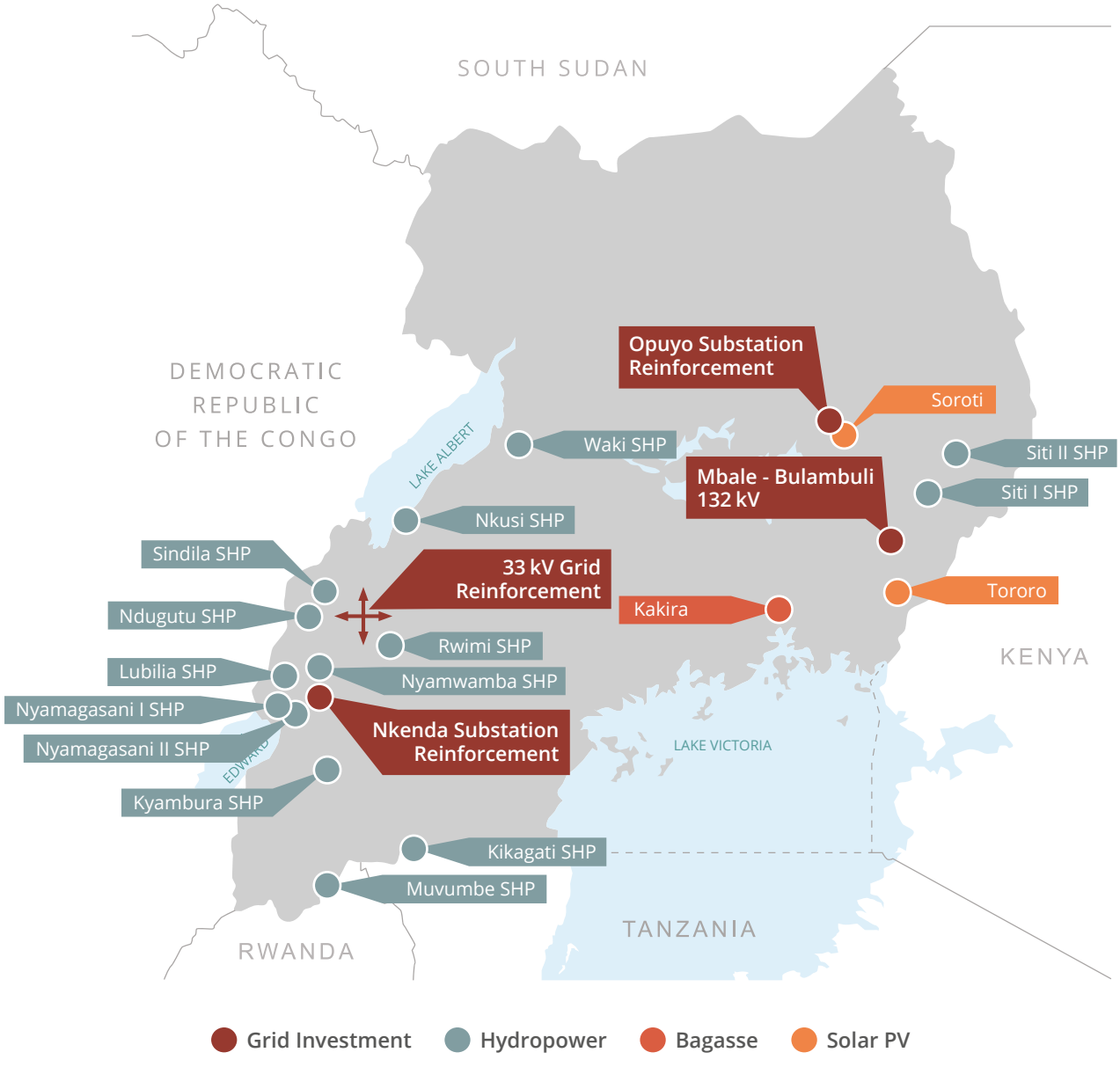


Figure 19 | GET FiT Uganda Project Map with Grid Investment in Red Boxes

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

Table 3 | Funding Commitments for Interconnection Support through GET FiT

Item	Required Intervention	Project Owner	Estimated Costs (MUSD)
1	Reinforcement of 33 kV networks in Western Uganda	UEDCL	**13**
2	Opuyo Substation upgrade	UETCL	**5.8**
3	TA support to ERA	ERA	**3.7**
Total grid interconnection support			**22.5**

Reinforcements of 33 kV Networks in Western 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 included the design, supply, construction, test and completion of the two Lots and were expected to be completed in August 2019, as per original EPC contracts. The contractors have completed line route surveys, technical designs and procurement of most of the required materials. However, the line construction has been delayed due to costs of wayleaves compensations in the densely populated load centres of Bundibugyo, Fort Portal (Lot A), and Kasese (Lot B), where the line runs alongside a national park. The contractors and REA are reviewing new line routes to minimize the cost and social impact of the lines. Construction will commence when line rerouting is completed and Project Affected Persons are compensated by REA. The timeframe for completion has not been confirmed by REA.

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 an outage.

Regarding implementation, the contracts for the Supervision Consultant and EPC contractor became effective in May 2018. The project implementation is at advanced stages. All design and procurement have been completed, and the construction progress was at 87 % in January 2020. The implementation schedule according to the contracts was originally 16 months but there have been delays due to slower than expected construction of the civil works. Completion is expected in Q1 2020.

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. Several other TA components have been conducted under the GET FiT TA Facility in previous years. Information on these can be found in earlier annual reports.

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 is to support ERA in the successful implementation of a Regulatory Information Management System 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 to Ernst and Young Uganda and the project was started in May 2018. The Consultant finalised the system design and solution report and the tender for the procurement of the contractor to implement the system has been launched by ERA in 2019. The system is expected to be completed in 2020.

Other Sector Interventions

Two wider sector interventions for grid reinforcements will directly impact the evacuation of power generated by GET FiT projects that are not funded by the Programme - namely the upgrade of the Nkenda substation and the implementation of the Mbale-Bulambuli 132 kV transmissions line.

The two GET FiT projects currently under construction (Nyamagasani 1 & 2) with a combined capacity of 20 MW will be evacuated through UETCL's Nkenda substation after their commissioning. Following years of anticipated capacity shortages, the substation was upgraded by UETCL in October 2019 from a capacity of 20 MVA at the time to 60 MVA by the transfer of a transformer from Kanyambeho substation in Fort Portal to Nkenda. This alleviated previous evacuation risks to the project portfolio and provides adequate capacity for the renewable energy projects in the Kasese area.

The planned 79 km Mbale-Bulambuli 132 kV transmission line is expected as a long term solution to evacuate power from the GET FiT supported Siti 1 and 2 SHPs. The line will also eliminate transmission bottlenecks in Eastern Uganda and enhance system reliability, availability, and quality of power supply. The scope includes the construction of the Bulambuli (Atari)-Mbale 132 kV transmission line and 132/33 kV substations at Bulambuli (Atari) and Mbale.

The feasibility study including ESIA scoping of the line has been completed, with funding from the EU ITF through KfW. The financing for the line's construction by KfW is about to be secured. The line is not expected to be completed before 2021. Hence, as mentioned earlier in this report, a new 33 kV line is currently being constructed as an important interim solution to evacuate power from Siti 1 and Siti 2.

05 Financial Status

5.1 Funding Commitments

As a results-based Programme, meaning that subsidies are being paid following actual delivery of energy, GET FiT Uganda is dependent on predictable commitments from sponsors in order to be successful. Several changes were made to the portfolio structure since the Programme's inception in 2013, demanding an active follow-up and resilience from all stakeholders. This requirement has also been met by the GET FiT funders to date, enabling the Programme to deal with any arising uncertainties and risks in a relatively 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, circa EUR 93 million has been committed to the Programme. An overview of the respective commitments can be found in Table 4.

EUR/GBP exchange rate developments had an adverse impact on the overall budget of GET FiT Uganda, due to donor commitments in GBP. A 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.**

Table 4 | Overall Donor Commitments to GET FiT

Donor	Net Amount Committed (EUR)
Norway	15,590,475
UK BEIS	28,593,096
UK DFID	14,128,113
GER BMZ	15,000,000
EU ITF	20,000,000
Total	**93,311,684**

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

A limited amount of undisbursed donor contributions remains at this stage: Approximately 8 % of the total GET FiT budget in form of 6.5 million GBP remain subject to foreign exchange risk. In that regard, GET FiT regularly monitors the relevant forex developments to allow for proactive actions if needed.

5.2 Disbursement Projections

GET FiT funds are disbursed for the following three purposes:

- 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,
- Consultants under the Technical Assistance Facility for ERA,
- Consultants for the overall management and monitoring of the Programme.

Figure 20 illustrates the actual (up to and including 2019) and projected disbursements from the Programme. The overview includes net funding available to the Programme only, after deduction of a modest KfW management fee. The projections are based on the status of the project portfolio and expected progress. During the first five years of operation of each project, results-based disbursements in the form of annual subsidies are made.

For the disbursement projections, the main uncertainty relates to actual COD for the various projects. Project construction delays have influenced the disbursement profile, shifting a considerable share of COD premium payments into 2020 and 2021. With all projects being 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 energy generation), significant under-production across the portfolio may lead to accumulation of excess funding. Eligibility for the annual subsidy payments will end in 2023 for all projects (except for Kikagati in 2024, which has been granted exception due to trans-boundary issues) signifying that there will not be any disbursement after 2024.

The annual GET FiT Steering Committee (SC) meeting was held on May 29, 2019 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). A key topic of the 2019 SC meeting was delayed and underperforming projects, as some were not able to meet the already extended COD deadline of October 2019. It was decided that no further deadline would be specified – but a penalty for projects that are not able to meet the deadline was imposed. The penalty amounts to 2.5 % of the total subsidy amount for every additional month of delay beyond the October 2019 deadline (October 2020

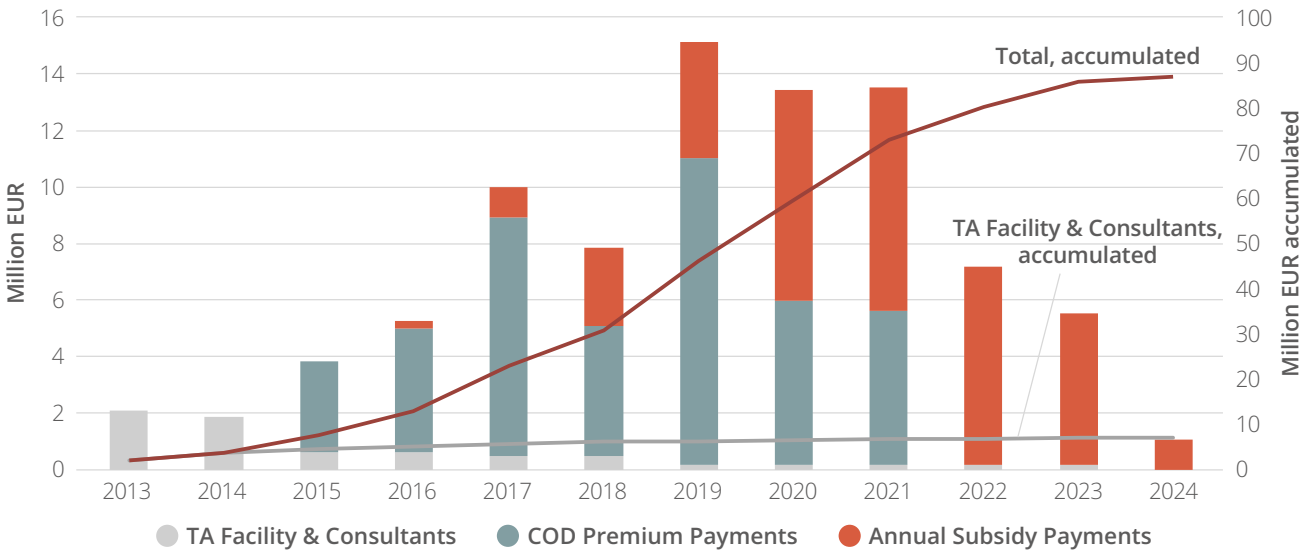


Figure 20 | Projected Annual Payments (Premium Payments and Consultants) under GET FiT

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

for Kikagati due to transboundary issues). It was agreed to shift substantial amounts of these savings towards the interconnection component which suffers underfunding due to delays and missing contributions from the Government of Uganda.

Figure 21 shows the relative shares of the various cost components under the GET FiT Programme, based on current budget reservations. Overall, approximately 8 percent of the overall funds are tied to management, implementation and the Technical Assistance Facility, while 92 percent of the total commitments are expected to be disbursed as premium payments.

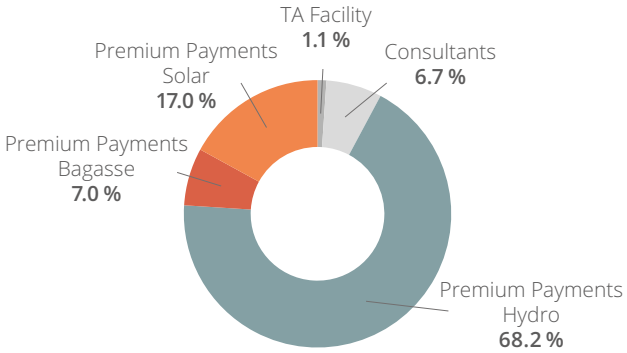


Figure 21 | Distribution of Budget Reservation of GET FiT Uganda

06 Programme Monitoring & Risk Management

6.1 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 an annual basis. The Programme's monitoring and evaluation are 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 behind schedule on achieving the original capacity targets, which aimed at full commissioning of the RE portfolio by the end of 2018. Despite the delays in project implementation, intensive efforts in previous years has resulted in good progress on most reporting dimensions.

Notably, due to a lower share of biomass projects in the portfolio than anticipated, the original capacity targets of 170 MW and 830 GWh/year, will not be achieved. Programme targets have not been revised to this end. Other targets that relate to the portfolio size, such as finance mobilised, or displacement of thermal generation may also be affected by the overall reduced capacity of the portfolio.

Nevertheless, the project portfolio delivered a 20 % increase in energy generation in 2019, and is already reaching, and even exceeding, some 2023 targets, such as job creation and sector-related indicators. With the commissioning of the entire portfolio in 2020/2021, and improved grid connection for some operational projects, the Programme also expects continued improvement in delivered results in the coming years.

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. It should be noted that an additional indicator – Output indicator 5.4 – has been added in 2019, tracking online delivery of ERA services in relation to the implementation of the Regulatory Information Management System (RIMS) in 2019/2020.

Table 5 | Overview of Impact, Outcomes and Outputs

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

Outputs

The Programme made progress on a range of Programme monitoring indicators in 2019 with the commissioning of four additional hydropower plants. Electricity generation picked up with approximately 315 GWh delivered to the grid in 2019. This represents approximately 56 percent of planned annual generation of commissioned projects overall. The difference can be explained by commissioning of projects during late 2019, as well as grid-related issues causing high deemed energy levels for certain projects. With 14 projects now to produce a full year and at least two other projects set for commissioning in 2020, the overall portfolio generation is expected to substantially increase in the coming calendar year.

The GET FiT portfolio is represented in most regions of the country and multiple renewable energy technologies – contributing to the country's geographical and technological diversification: The Programme has generation capacity in all regions of the county, except in Northern Uganda and has projects with Solar PV, Hydro and Bagasse technologies. In addition, it is diversifying the group of developers, contractors and other players that participate in the Ugandan electricity sector; almost 50 percent of generation projects in the country (14 out of 30) are supported by GET FiT.

With an increasing level of energy generation, the Programme portfolio is contributing to reducing Uganda's GHG emissions. 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. However, thermal generation has reduced significantly from 200 GWh in 2018 to almost 100 GWh in 2019. It will be exciting to see to what extent GET FiT can continue to offset thermal generation in 2020, while awaiting commissioning of the 600 MW large hydropower plant Karuma in Uganda.

The GET FiT portfolio has direct effects on the local economy and made a substantial contribution to local job creation. This is represented by almost 10,500 newly created jobs (FTE's – Full Time Equivalent) in relation to the portfolio alone, by far exceeding the initial target. In 2019, the portfolio has contributed another 1,700 FTE jobs, compared to last year's 2,700. This decline is due to more projects reaching commercial operations and fewer construction jobs. Notably, the share of Ugandan employment is almost 90 percent.

In addition, indicators relating to the Technical Assistance activities at the regulator ERA achieved very positive results. Time-efficient issuance of generation licenses could be maintained from last year, exceeding the initially targeted processing time. In addition, a REFiT review took place in 2019, and reporting requirements were tracked closely and are largely complete and on time. In line with these results, GET FiT is happy to see ERA being ranked number 1 in the Africa Electricity Regulatory Index for the second time.

Finally, GET FiT projects have raised over USD 455 million in investments for the portfolio – approximately USD 165 million in private, and USD 190 million in public funding. Private financing represents a share of 36 percent. During 2019 the remaining project Kikagati achieved financial close.

An overview of all Output indicators is presented in **Table 6.**

Table 6 | Output Indicators

Indicator	Target 2023	Status 2019	Target Achieved	Comment
Output 1 – Increased small scale renewable energy capacity and generation				
Indicator 1.1 MW installed	170 (158.4)	**122.4**	77 %	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 (762)	**316.08**	38 %	Commissioned projects have an expected annual generation of 557.7 GWh. The current portfolio has a planned total output of approximately 762 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 $MtCO_2e$)	4.03	**0.65**	16 %	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 (FTE) created	4,200	**10,379**	247 %	GET FiT is exceeding targets on this indicator. Approximately 1,700 full-time equivalent (FTE) jobs were created in 2019.
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	**1.2**	Target exceeded	Three generation licences were reviewed in 2020, with an average time taken for the review of 35 days. This is almost equivalent to last year's value and exceeds the 2023 target.
Indicator 5.2 Number of REFiT tariff reviews taking place by ERA per year	1	**1**	100 %	In January 2019, a consultant, MS. Economic Consulting Associates was contracted to undertake the review of the Renewable Energy Feed in Tariff (REFiT IV). This Assignment was completed and the ERA board approved the new set of REFiTs effective April 2019 for another 2 years.
Indicator 5.3 Timely and complete reporting to ERA by licensees	100 %	**91 %**	91 %	152 out of 168 reports were submitted complete and on-time.
Indicator 5.4 Online delivery of ERA services	50 %	**0 %**	0 %	The Regulatory Information Management System (RIMS) is being implemented in the course of 2020.
Output 6 – Finance mobilised for GET FiT portfolio				
Indicator 6.1 Private finance mobilised for GET FiT portfolio (in USD million)	200	**165**	83 %	All projects have reached financial close. Due to the reduced portfolio size following inception, the target will not be reached.
Indicator 6.2 Public finance mobilised for GET FiT portfolio (in USD million)	300	**290**	97 %	All projects have reached financial close. Due to the reduced portfolio size following inception, the target will not be fully reached.

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.[7]

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

The regulator has issued three development permits and nine generation licences for renewable energy projects with capacities under 20 MW in 2019, including seven hydropower projects and two solar PV projects. ERA highlighted the progressive increase in licence applications from 2013 until 2019 in the annual monitoring, indicating a favourable development of the investment environment. As highlighted in the Output section, the process of issuing generation licences has maintained high efficiency, with only about one month taken to review applications.

While the power utility UETCL has paid all its invoices for delivered energy in 2018, five developers have reported delayed deemed energy payments. The deemed energy invoicing process was reviewed by ERA in early 2019, however, delays in payments are still reported by developers. These delays 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 electricity purchased from thermal power stations has reduced drastically from circa 200 GWh in 2018 to ca. 100 GWh in 2019, which is well below the target of 832 GWh in 2023. However, capacity payments remain part of a Government subsidy, 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.**

[7] The indicators for Outcome 3 – Improved local grid stability have become inadequate for 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.

Table 7 | Outcome Indicators

Indicator	Target 2023	Status 2019	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	**12**	100 %	3 generation licences and 9 development permits were issued in 2019.
Indicator 1.3 Occurrence of annual "UETCL event of default" for energy supplied (deemed energy)	0	**0**	n/a	There have been five delayed deemed energy payments. While deemed energy invoicing process has been reviewed by ERA in early January 2019, delays in deemed energy payments are still reported.
Indicator 1.5 REFiT adjusted to be cost-reflective (in percent)	100 %	**100 %**	100 %	REFiTs were adjusted in 2019 (REFiT IV), and are now providing ceiling tariffs, with a maximum return on equity for respective technologies.
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**	Target achieved	All energy purchased beyond stand-by capacity was covered by tariffs.
Indicator 2.2 GWh purchased by UETCL from thermal stations	832	**103**	Target exceeded	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 and commissioning of Isimba. Last year's purchases were at 199 GWh.
Indicator 2.3 Cost-reflective retail tariffs (in percent)	100 %	**97 %**	97 %	Capacity payments remain part of the subsidy paid by the Government. These increased from 95 % in 2018, to a cost reflectivity at 97 % in 2019.

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. **Table 8** provides an overview of the Impact indicator developments in 2019.

Grid-related CO_2 emissions have reduced in 2019. With an increased energy generation from the GET FiT portfolio, as well as the commissioning of the Isimba hydropower plant, less energy was dispatched from fossil fuelled power plants in 2018. As such, the indicator is currently exceeding the target set for 2023. While this can be attributed to an increase in renewable energy supplied from GET FiT projects and others, it is also due to a higher electricity consumption.

In a joint sector review during 2019 the electrification rate was assessed. A significant jump of the electrification rate to 28 percent was reported. The new Electricity Connections Policy, which launched in November 2018 was highlighted as a key contribution to these developments. In 2019, over 150,000 new household connections were made. The target for the connection policy is to realise over 300,000 new connections annually. With these developments, the 2023 target of 26.4 percent was exceeded.

Table 8 | Impact Indicators

Impact Indicators	Target 2023	Status 2019	Comment
Indicator 1 Grid related CO_2 emissions per unit electricity use	0.09	**0.016**	Grid related CO_2 emissions decreased considerably to 2018 from 0.037 to 0.016, which can be attributed to 50 % less thermal generation and higher consumption in 2019.
Indicator 2 Percent of population with access to electricity	26.4 %	**28 %**	The electrification rate has increased significantly from 20 % in 2017 and 22 % in 2018 to 28 % in 2019.
Indicator 3 Electricity consumption (kWh per capita)	105	**103**	Electricity consumption per capita was 101 kWh per capita in 2018 and has seen a slight increase in 2019.

6.2 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. Inadequate grid infrastructure and/or operations within the local and regional distribution and transmission networks continue to present the main risk against achievement of Programme targets. As a result, in 2019, approximately 22 percent of the energy generation at GET FiT power plants failed to reach Ugandan electricity customers due to grid availability issues (deemed energy). The current level of deemed energy generated by GET FiT and other power plants across the country poses a major risk to the sustainability of the Ugandan power sector. Importantly, the remaining three GET FiT projects under construction are also facing challenges related to securing adequate connection to the grid. Unless these issues are resolved prior to commissioning of the plants, deemed energy levels from the GET FiT portfolio could still rise significantly. On this basis, the risk category for grid connection is maintained with a high probability and high impact.

Operational performance. With most of the GET FiT projects now operational, a different set of risks are introduced. The technical performance, operations and maintenance of each plant will affect the targeted level of annual energy production across the portfolio. E&S performance in the operational phase is also vital to ensure a sustainable energy generation from GET FiT plants for the next two decades.

While GET FiT Uganda was primarily rigged to support projects up to COD (which is reflected in the Programme's legal framework and budgets) the Programme is also trying to monitor general post COD performance to the extent possible. This is maintained through review of annual energy production in relation to subsidy disbursements, and one or two post COD visits to each project in order to capture key issues and experiences. One issue that has become clear during operational phases to date, is that some developers are not documenting compliance with minimum flow in a satisfactory manner. While such operational risks are not formally part of the GET FiT risk framework, it is highly important that they are monitored and managed by the Ugandan authorities. Therefore, as a first step, KfW and the GET FiT supervision team have addressed the issues with the relevant developers and provided documentation as a basis for GoU to follow up on the issues going forward.

Project construction delays. Although 14 GET FiT projects are now commissioned, three projects remain under construction which, due to their size, represent more than 20 percent of the total portfolio capacity. These projects have demonstrated unsatisfactory progress over the past year due to design and construction challenges, and two of them failed to achieve their extended COD deadline of October 2019. This will lead to subsidy reductions and thereby affect project viability in negative manner, while also increasing GET FiT supervision and Programme management cost. This risk category is still rated with high probability and high impact.

Health, Safety and Environment (HSE). Despite the remaining projects under construction 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 daily, 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.**

Table 9 | Risk Matrix

Description of Risk	Mitigation Actions	Progress	Risk Assessment
Deemed commissioning of GET FiT projects due to poor planning at key institutions, as well as lack of funds, to ensure timely infrastructure for grid connection. **Operational GET FiT plants generating power at reduced capacity due to continued, unresolved constraints of the national grid (HV/MV).**	Additional funding provided by GET FiT donors to support selected, critical grid infrastructure investments required for connection of GET FiT projects. Comprehensive efforts by GET FiT to fast-track implementation of grid infrastructure projects managed by GoU agencies, which are relevant to the GET fiT portfolio.	Unsatisfactory progress on GET FiT funded grid infrastructure projects due to various implementation challenges, including major E&S issues related to compensation. High risk of continued increase in deemed energy generation from the GET FiT portfolio.	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 2018-19 to improve the robustness of project designs and to reduce the likelihood of landslides. Further changes may be necessary for remaining projects during 2020 to manage residual risks.	medium

07 GET FiT Zambia

The second roll-out of the GET FiT concept – GET FiT Zambia - was officially launched in February 2018 in Lusaka and is now in its second year of implementation. This represents a major achievement for GET FiT and further strengthens its prospects in Sub-Saharan Africa.

The objective of the Programme is to improve the framework conditions for private investments in small-scale renewable energy in the country. The central component of GET FiT Zambia is the procurement of up to 200 MW in renewable energy projects of up to 20 MW from IPPs. The Programme is a partnership between the Zambian Department of Energy and KfW, implemented by the GET FiT Secretariat (managed by Multiconsult). Other key stakeholders are the Energy Regulation Board (ERB) and the state-owned power utility ZESCO Ltd. The Programme has already received a funding pledge of 41 million EUR from the German government.

At the core of the Programme is the procurement of 100 MW solar PV and 50 MW small hydropower (Phase 1), with the prospect of an additional 50 MW depending on available funding. In addition, the Programme comprises a set of tools that addresses barriers and gaps in the Zambian energy sector (see illustration below).

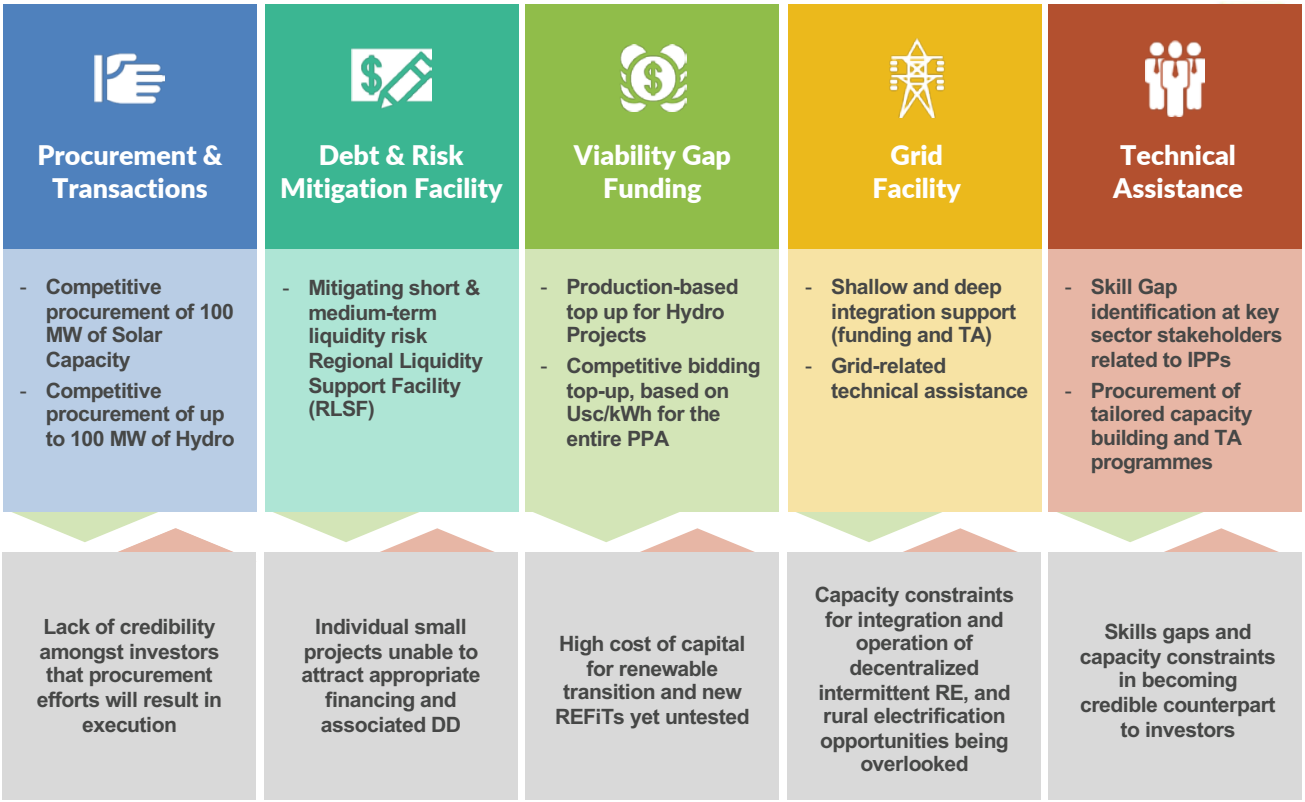
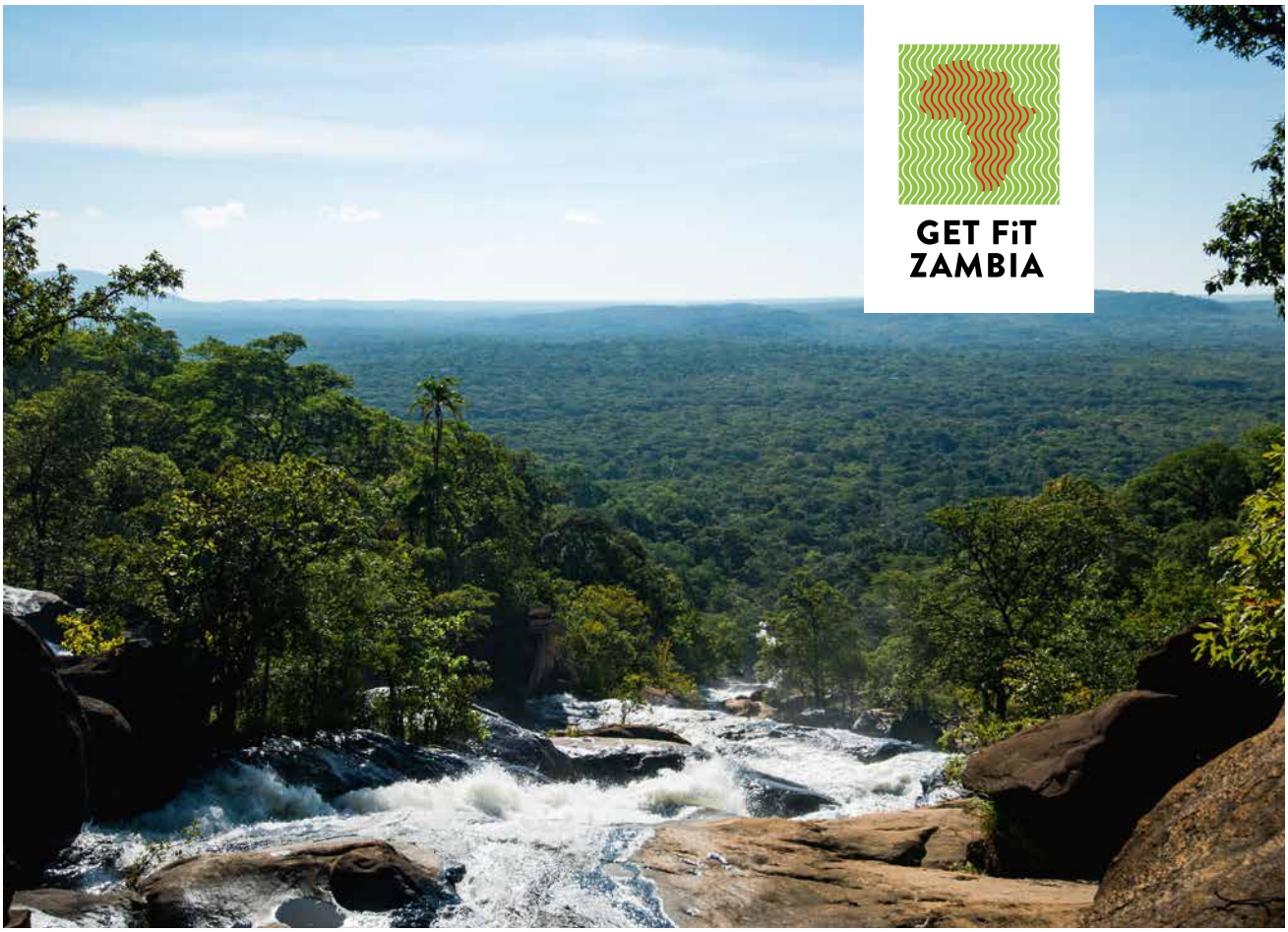


Figure 22 | GET FiT Zambia Toolbox



Record-breaking Results in a Highly Competitive International Tender

The first procurement round of GET FiT Zambia has concluded with the award of six solar PV projects of 20 MW_{ac} each. The Solar tender was run as a two stage-bidding auction preceded by a pre-qualification stage (Request for Qualification) and a combined technical and financial scoring at the final bidding (Request for Proposal) stage which was launched February 2018. In April 2019, the Permanent Secretary of the Zambian Ministry of Energy announced the award of six solar PV IPP projects, totalling 120 MW_{ac}. The lowest successful bid came in at 3.999 USc/kWh and the weighted average of all six successful projects is 4.41 USc/kWh.

The GET FiT Zambia Solar tender became the largest single Solar PV tender implemented in Sub-Saharan Africa (SSA) to date outside of South Africa, and the first time a tariff below 4 USc/kWh was achieved through a public tender in SSA. The tender had a target outcome of a total of 100 MW_{ac}, but due to the favourable results, the GRZ and GET FiT Investment Committee awarded an additional 20 MW_{ac}.

Promoting Private Sector Engagement in the Power Sector with a 50 MW Small Hydro Tender

The second procurement round of the Programme is aimed at procuring a total of 100 MW, supporting the development of small hydropower projects up to 20 MW. The tender process includes a prequalification procedure which concluded in April 2019. This will be followed by the award of up to 100 MW of small hydropower capacity through the implementation of several RfPs between 2020 and 2021.

Further Information & Updates

Stay informed about development in the GET FiT Zambia Programme, please visit the website **www.getfit-zambia.org,** sign up for the GET FiT Zambia **newsletter,** or follow the Programme on LinkedIn and Twitter.

08 Outlook for 2020

In 2020, GET FiT Uganda will focus on close follow-up of the three hydropower projects still under construction. The projects have already been granted extensions beyond the original window for GET FiT funding and further delays will jeopardise their continued support by the Programme. Demonstrated efforts and progress is therefore key, and the GET FiT Implementation Consultant will undertake supervision visits to each project until COD is achieved. While it has already been established that one of the projects will not reach COD until 2021, it is expected that the other two could make it in 2020.

Some projects, both commissioned and non-commissioned, are still facing environmental and social compliance issues, which are being monitored carefully by GET FiT. In general, continuous improvements were observed for the projects in their construction phase during 2019, but there are still serious outstanding issues such as compliance with minimum flow requirements. GET FiT will continue to cooperate with ERA to address these issues and provide guidance for future follow-up.

With 14 of the 17 GET FiT projects now evacuating much needed power to the Ugandan grid, 2020 will be another exciting year for the Programme, with persistent challenges and a lot to celebrate. Helping newly commissioned projects to achieve a successful first year of operations will be important, along with close follow up for the remaining plants that are now severely behind on their construction schedules. Finally, as in previous years, continued efforts to ensure progress on grid infrastructure investments that affect GET FiT projects will remain critical.

The finish line for GET FiT Uganda is undoubtedly approaching fast, after more than seven years of hard and dedicated work by a range of Ugandan stakeholders, project developers, and development partners. Certainly, the Programme is already a success story, now contributing almost one tenth of Uganda's electricity from clean and renewable sources, funded mainly by private investors! However, as this report has shown, work remains. For the next couple of years, coordinated and dedicated efforts will be needed by all stakeholders to ensure a successful finish and a sustainable legacy.

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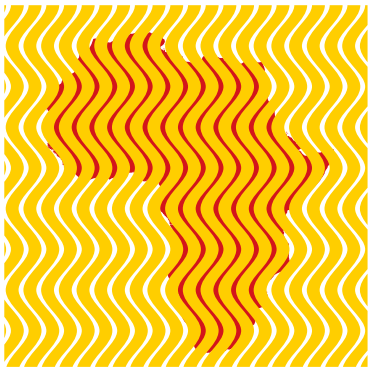

GET FiT
UGANDA