GET FiT UGANDA

ANNUAL REPORT 2021

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GET FiT UGANDA

Annual Report

2021

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Message from KfW

The GET FiT Programme can now proudly announce that in 2021 an important and long awaited milestone by all stakeholders has been achieved. All 17 power generation projects developed under the Programme are now commissioned and operational. The last three remaining projects, namely Nyamagasani 1 SHP, Nyamagasani 2 SHP and Kikagati SHP, were commissioned in 2021, adding 36 MW of new installed capacity to the Ugandan electricity grid. The portfolio has now reached its targeted size of 158 MW and contributes with a planned generation of 760 GWh of renewable energy annually to the country's supply.

A further achievement in 2021 was the completion of the upgrade of Opuyo transmission substation, increasing the previous transformer capacity four times. This has contributed to improving the reliability and stability of the power grid in Eastern Uganda, which has several operational and planned renewable energy projects.

Many challenges have had to be resolved over the years to finally reach operational status for all power plants. Key challenges in 2021 included construction delays for remaining projects due to international travel restrictions, national curfews and reduced workforce productivity as a result of the COVID-19 pandemic. Additionally, a number of operational projects continued to experience challenges of inadequate grid infrastructure to fully evacuate the energy generated.

To overcome the challenges encountered over the years, strong ownership of the Government of Uganda led by ERA, the commitment of the Project Developers, and the continuous support of the GET FiT Development Partners, i.e. the Governments of the United Kingdom, Norway, the Federal Republic of Germany as well as the European Union, were critically important. Without this powerful cooperation and will to implement the Programme, the great accomplishment of having now commissioned all projects would not have been realized. In the coming years, the Programme will continue to closely monitor the projects to ensure sustainability and effective operations.

Going forward, the timely development of transmission and distribution grid infrastructure will be key to facilitating the smooth delivery of electricity from the generation plants to the end consumer. In this regard, more work lies ahead for the Programme, sector agencies and Government. In particular, the completion of the planned new interconnection lines in Western Uganda to evacuate power from five GET FiT projects will be critical for the overall success of the Programme. A concerted effort by all stakeholders will be needed in 2022 to implement the required infrastructure reinforcements.

We thank the Government of Uganda, ERA, Development Partners, Project Developers and all stakeholders for the continued support to GET FiT Uganda, and extend our congratulations on the achievements made to date. We remain committed to ensuring the successful completion of the Programme, and look forward to continuing our cooperation and contribution to increased access to clean energy in Uganda.

Strong ownership of the Government of Uganda led by ERA, the commitment of the Project Developers, and the continuous support of the GET FiT Development Partners, were critically important to overcome the challenges encountered. Without this powerful cooperation and will to implement the Programme, the great accomplishment of having now commissioned all projects would not have been realized.

Helmut Gauges

Message from ERA

The Global Energy Transfer for Feed-in Tariff Program (GET FiT), launched and run by ERA since 2013, has been a hallmark project in Uganda's Electricity Supply Industry history. The Program has presented notable benefits to the electricity sector, including advancing Uganda's generation capacity and broadening Uganda's energy mix.

The Programme has been a success, as demonstrated by other countries using GET FiT as a benchmark and implementing its principles to ensure their countries' energy security. Leveraging its unique ability to attract private sector investments, the GET FiT Program has provided approximately eight percent of the total electricity supply in Uganda in 2021. Uganda's total installed generation capacity has grown from 400 MW in 2000 to 1358 MW as of January 2022 among other factors due to the GET FiT Program.

The Program has enabled the diversification of Uganda's generation mix in such a way that 14 out of the 17 operational plants are hydropower plants with a combined installed capacity of 118 MW, two solar PV projects with a combined installed capacity of 20 MW, and one bagasse cogeneration plant with 20 MW installed capacity, all delivering clean, Renewable Energy to the national grid. The Small Hydropower Plants constructed under the GET FiT Program have helped to guarantee Uganda's Energy Security, thereby supporting the country's electrification and industrialization agenda.

However, the implementation of the GET FiT Program has not all been a walkover. There have been challenging seasons, particularly the outbreak of the COVID-19 Pandemic coupled with floods in western Uganda, that have affected the timely completion of some of the projects. The pandemic affected project construction timelines and operations, on top of the floods damaging the construction works already in place. Despite these challenges, GET FiT projects have shown enormous resilience and I would like to commend the project developers who never gave up but pressed on to the goal.

As the GET FiT Program comes to an end in Uganda, I can confirm that it has positively impacted the Ugandan Electricity Supply Industry and economy. The program has presented a great opportunity to Ugandans to benefit not only from the availability of clean energy but also from several business ventures offered by GET FiT projects in the communities.

Our sincere appreciation goes to the Government of Uganda, the Ministry of Energy and Mineral Development, the German Development Bank, KfW, the Government of the United Kingdom, Norway and the Federal Republic of Germany, the European Union, and other agencies for making GET FiT a success. As a sector, we are looking for more of such projects to focus on other segments in the electricity supply chain such as access, transmission, and distribution for the betterment of the sector in order to contribute to the socioeconomic transformation.

The Program has enabled the diversification of Uganda's generation mix, delivering clean, Renewable Energy to the national grid. The Small Hydropower Plants constructed under the GET FiT Program have helped to guarantee Uganda's Energy Security, thereby supporting the country's electrification and industrialization agenda.

Eng. Ziria Tibalwa Waako

PA Technical Services (PATS) successfully commissioned the 9.6MW Nkusi SHP project in 2018. The project has contributed to the increased availability of energy in the Hoima and Fort Portal regions. PATS wishes to thank all the stakeholders, GET FiT and monitoring agencies for their support and guidance in the execution of this project.

We look forward to continuing the relationship with the GET FiT team in the years to come.

Asa Katama | **Nkusi SHP**

Executive Summary

All 17 GET FiT generation projects have achieved commissioning. In 2021 GET FiT commissioned its last three power projects, marking the end of the successful development and construction of 17 small renewable energy power projects since its inception in 2013. This landmark signifies the fulfillment of GET FiT's primary objective of facilitating private investments in the sector, as Independent Power Producers (IPPs) have developed all projects. During the nine years of implementation, GET FiT first had to lay a solid foundation to attract these IPPs. This included facilitating private investments, for example, through the development of standardised transaction documents to make investments in power projects in Uganda more attractive. These documents have since been used for further private investments in the power sector, illustrating that the GET FiT impact goes beyond the development of the 17 projects in the GET FiT portfolio.

The entire GET FiT portfolio is now in operation. In 2021, the GET FiT portfolio increased its operational capacity from 122.4 MW to 158.4 MW through the commissioning of the three last power projects, Nyamagasani 1 (15 MW), Nyamagasani 2 (5 MW), and Kikagati (16 MW). The portfolio now consists of 118 MW of installed hydropower capacity, 20 MW of installed bagasse cogeneration capacity, and 20 MW of solar capacity. The portfolio now contributes 12 % of the installed capacity in Uganda and approximately 9 % of the Ugandan electricity generation in 2021. With a functional and reliable power evacuation infrastructure, the portfolio has a planned annual generation capacity of approximately 760 GWh. However, since the three last projects were commissioned in February (Nyamagasani 2), August (Nyamagasani 1), and December (Kikagati), and as such, did not produce throughout the entire year, the full production potential could not yet be realised in 2021. The total generated and sold electricity in 2021 would have been 487 GWh, approximately 65 % of the targeted annual generation. Due to grid unavailability, only 418 GWh could be delivered to the grid, constituting a 10 % increase compared to the previous year.

Improved evacuation of GET FiT electricity production. In 2021, the total deemed energy was at 69 GWh, constituting circa 14 % of the total generation of the portfolio. This is a significant improvement compared to 2020, which recorded 130 GWh of deemed energy (25 % of the total electricity generation in 2020). This reduction by almost 50 % is a significant achievement, showing promising progress for the power evacuation infrastructure. This improvement can be attributed to improved grid connection and evacuation infrastructure at several projects, such as Siti 1, Siti 2, Nkusi, and Waki SHPs. Nevertheless, deemed energy remains a considerable challenge for the Programme and comes with high costs for the country, as power producers need to be compensated for deemed energy. In addition, the current connection infrastructure of the newly commissioned projects remains constrained, and annual deemed energy will increase once these projects are in operation for a full year. By reinforcing the 33kV grid in the Western region, GET FiT is actively working towards the improved evacuation of these projects.

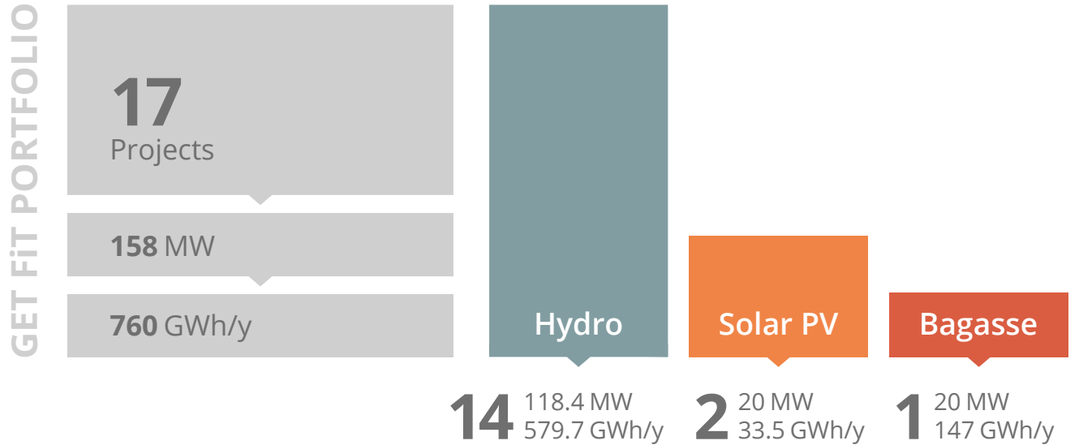
Addressing remaining grid connection and interconnection issues. GET FiT is closely monitoring the evacuation constraints as this is the main issue to be resolved before all projects can fulfill their generating potential and inject clean power into the grid. The GET FiT interconnection component was designed to support these efforts and comprises the reinforcement of the Opuyo substation, technical assistance to ERA, and grid reinforcements in Western Uganda. One main achievement in 2021 was the completion of the Opuyo substation in September, which now has additional backup transformer capacity, partly mitigating the evacuation risks for the Soroti solar PV plant and other pipeline projects in Eastern Uganda. The grid reinforcements in Western Uganda will significantly improve the grid infrastructure for the Ndugutu, Sindila, Nyamagasani 1, Nyamagasani 2, and Lubilia SHPs, which are currently experiencing high levels of deemed energy.

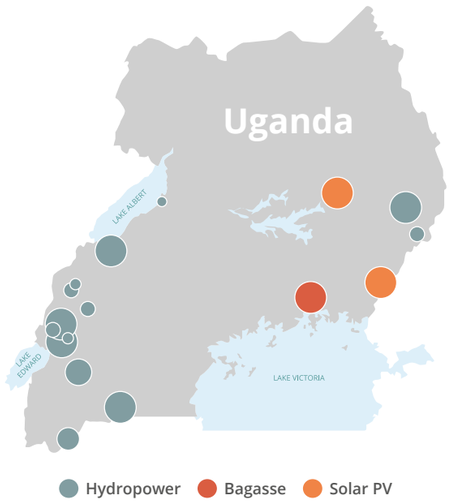
Still the best in Africa. For the fourth consecutive year, the Electricity Regulatory Authority (ERA) has been ranked number one in Africa in the 2021 Electricity Regulatory Index of the African Development Bank. As a key stakeholder of the Programme, ERA is supported via a number of Technical Assistance activities – contributing to the outstanding performance of the regulator. One such initiative that is still under implementation is the Regulatory Information Management System (RIMS) – intending to automate and digitalise the regulatory processes. The project is expected to be completed in the second quarter of 2022.

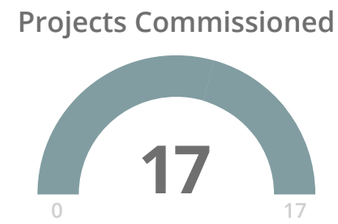
Exceeding targets on job creation through GET FiT. By 2021 the local employment of construction and operation and maintenance workers exceeded 12,600 Full-Time Equivalents (FTE), which is three times the target for 2023. The target of 4,200 local workers was exceeded already in 2017. Construction delays due to COVID-19 and rectifying damages from flooding events in 2020 have contributed to an increased demand for labour in 2020 and 2021.

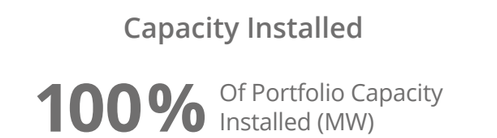
Environmental and social performance of the GET FiT portfolio – a gold mine for lessons learned. Environmental and social performance has been a focus area for GET FiT since the inception of the Programme, through the construction phase of the projects and now, during the operational phase of all projects. All projects supported by the GET FiT Programme needed to be developed and operated in compliance with Ugandan regulations and the environmental and social performance standards (PS) of the International Finance Corporation (IFC). Following up closely in this area has been important, as several environmental and social issues have been uncovered throughout the implementation. As such, the projects within the GET FIT portfolio have been developed and are being operated in a more responsible manner than would have otherwise been the case. GET FiT will continue to focus on environmental and social performance during the operation period of the 17 projects until the Programme ends. A wider contribution than just following up on these 17 projects is the capacity-building and learning at public institutions – making it more likely that the lessons from GET FiT will lay a solid foundation for even better environmental and social management in project development in the future.

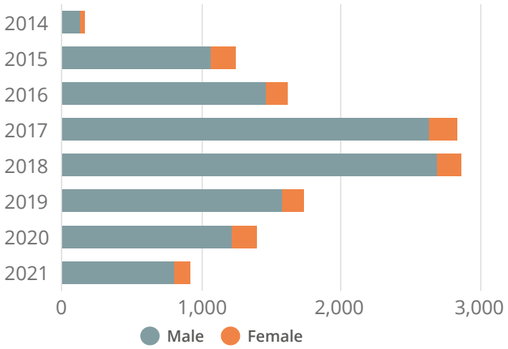
Outlook for 2022. In 2021 the three last power plants in the GET FiT Portfolio were commissioned, achieving the main Programme milestone with all projects commencing operations. It is a massive achievement that 17 projects have successfully been constructed under GET FiT, demonstrating an impressive track record for small-scale power projects in Uganda. However, the work for GET FiT in Uganda is not yet done. The Programme is committed to addressing the challenges that remain and ensuring that it has a lasting impact on the energy sector in Uganda. This includes a push for the completion of grid reinforcements in Western Uganda, continued efforts on environmental and social issues such as compliance with environmental minimum flow via the Environmental Flow Working Group, and support to ERA, finalising the implementation of the Regulatory Information Management System.











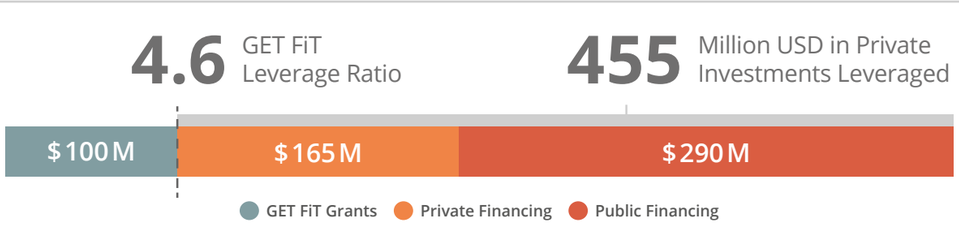


Table of Contents

List of Abbreviations

CO_2	Carbon Dioxide
COD	Commercial Operation Date
BEIS	Department for Business, Energy & Industrial Strategy, UK
DFA	Developer Financing Agreement
DFID	Department for International Development, UK, now the Foreign, Commonwealth & Development Office
EDM	Electricidade de Moçambique
EPC	Engineering, Procurement and Construction (a form of contract)
ERA	Electricity Regulatory Authority
E&S	Environmental and Social
EU ITF	European Union Infrastructure Trust Fund
FCDO	Foreign, Commonwealth & Development Office, UK
GET FiT	Global Energy Transfer Feed-in Tariff
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
MIREME	Ministério dos Recursos Minerais e Energia, Mozambique
$MtCO_2e$	Million Tonnes of Carbon Dioxide Equivalent
MVA	Mega-Volt-Ampere
MW	Megawatts (of installed power capacity) 1 MW = 1000 kilowatts
PAP	Project Affected Person
PPA	Power Purchase Agreement
RAP	Resettlement Action Plan
RE	Renewable Energy
REA	Rural Electrification Agency
REP	Rural Electrification Programme
RfP	Request for Proposal
RIMS	Regulatory Information Management System
SHP	Small Hydropower Plant
SPCC	Sector Planning and Coordination Committee
TA	Technical Assistance
UEDCL	Uganda Electricity Distribution Company Limited
UETCL	Uganda Electricity Transmission Company Limited

01 About GET FiT Uganda

The GET FiT (Global Energy Transfer Feed-in Tariff) Uganda Programme was officially launched on May 31st, 2013. The Programme, which was 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 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 aims to fast-track 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 760 GWh of clean energy production per year, transforming Uganda's energy mix and resulting in:

- Emission reductions of roughly 10 million tonnes of Carbon Dioxide (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, are presented in the **GET FiT Annual Reports** produced since 2013. Following the success of the Programme in Uganda, the GET FiT concept has been replicated in other countries, with the launch of GET FiT Zambia in 2018 and the anticipated launch of GET FiT Mozambique in 2022.

GET FiT UGANDA


GET FiT Uganda

02 Project Portfolio Status

2.1 Portfolio Status

2.1.1 Overview

At the beginning of 2021, 14 of the 17 small scale renewable energy projects supported by the GET FiT Programme were already connected to the Ugandan grid. The three remaining small hydropower plants (SHPs) were still under construction, having been delayed by the global COVID-19 pandemic since early 2020 (which affected the Nyamagasani 1, Nyamagasani 2, and Kikagati SHPs) as well as major flooding events in Western Uganda, which occurred in May 2020 (and affected Nyamagasani 1 and 2 SHPs) – see further below for more details. By the end of 2021, the remaining three SHPs had resolved outstanding design issues, constructed key structures required for power generation, and were delivering electricity to the Ugandan grid – a major milestone for the GET FiT Programme.

The 17 GET FiT supported projects now contribute a combined installed capacity of 158.4 MW to the Ugandan grid and delivered 418 GWh of electricity in 2021, corresponding to 9.4 % of the total grid electricity supplied in Uganda. Since the first project was commissioned, the GET FiT portfolio has generated almost 1.5 TWh. With all projects now operational, the electricity delivered to the grid is expected to rise to an estimated 760 GWh on average per annum. During the 20 year lifespan of the PPAs, this is estimated to have the effect of reducing CO_2 emissions by approximately 10 million tonnes.

2.1.2 COVID-19 Pandemic

The COVID-19 pandemic emerged in early 2020 and severely disrupted international travel and shipping as well as the movement of people within Uganda. The developers of the three remaining projects under construction – the Nyamagasani 1 and 2 SHPs and the Kikagati SHP – had accordingly claimed Force Majeure, with travel restrictions imposed worldwide affecting the movement of key project staff as well as significant supply chain disruptions for many of their suppliers.

In 2021, the Developers continued to cite the pandemic as a major cause of delays throughout the remainder of the construction phase due to travel restrictions, national curfews, workforce infections, and quarantine procedures. International travel restrictions had earlier been relaxed as of 1 October 2020 with the re-opening of Entebbe International Airport, which remained open during 2021. Ugandan procedures and requirements for international and in-country travel remained in place and continued to be adapted to suit the changing conditions.

The general lifting of international travel restrictions in October 2020 permitted the GET FiT Implementation Consultant to recommence closer follow-up of projects still under construction through site visits during Q2 and Q4 2021. Continued dialogue with developers was also maintained throughout the year to track progress towards achieving their respective Commercial Operation Dates (COD).

2.1.3 Recovery from May 2020 Floods

In May 2020, major floods in Western Uganda substantially impacted the construction progress of the Nyamagasani 1 and 2 SHPs as well as the operation of the Nyamwamba and Lubilia SHPs. All four projects experienced varying degrees of flood damage and required significant reconstruction efforts, which continued during 2021.

Nyamagasani 1 and 2 SHPs

The May 2020 floods had resulted in impaired construction access to critical sections of works at the Nyamagasani 1 and 2 SHPs and substantial damage to sections of the Nyamagasani 2 SHP waterway and intake. By the end of 2020, construction access at the Nyamagasani 1 SHP had been re-established, and replacement construction plant was mobilised, enabling the construction of the key remaining structures to progress early during 2021. The reconstruction of damaged sections of the Nyamagasani 2 SHP intake was also completed early in 2021, enabling plant commissioning tests to proceed.

The requirement to construct new riverbank protection works at both SHPs, to protect key project infrastructure during future floods remained critical during 2021, particularly at the powerhouses of both plants and alongside the reconstructed sections of Nyamagasani 2 SHP upper waterway. Progress in finalising the designs and constructing the works since the May 2020 floods had been poor, primarily due to ongoing commercial issues between the Developer and the Engineering, Procurement and Construction (EPC) contractor. These essential works were since completed in 2022.

Nyamwamba SHP

At the Nyamwamba SHP, the May 2020 floods had resulted in significant damage to the intake structure and upstream channel, flooding of the powerhouse and reduced site access, resulting in unplanned outages lasting several months. By the end of 2020, reconstruction works at the intake had been completed, and a temporary generating unit had been assembled from salvaged parts, allowing the plant to continue generation whilst continuing with rehabilitation efforts.

In 2021, replacement equipment was installed at the powerhouse, and all three generating units were fully restored, with the plant again able to generate at the original installed capacity. Designs for flood protection structures upstream of the intake and for the essential reinstatement of riverbanks in the surrounding area were still ongoing, however, with plans only being finalised and construction works commencing from the end of 2021. The remaining works have since been completed in 2022.

The May 2020 floods also resulted in a substantial change in the nature of sediments being transported by the Nyamwamba River, which had resulted in the accelerated degradation of key operating equipment and had necessitated changes in operating protocols. The further refurbishment and/or replacement of key equipment will also be necessary in due course. Investigations into the sediment issues and identification of options to improve sediment management and/or impacts were ongoing during 2021, with the expectation of defining a clear way forward in 2022.

Lubilia SHP

The May 2020 floods also resulted in damage to the Lubilia SHP intake and powerhouse structures. However, the extent was less severe than experienced at the Nyamwamba SHP, resulting in a substantially shorter period of operating downtime. Design modifications and reconstruction efforts were again required to restore the robustness of key project structures to a standard similar to the pre-flood condition. The construction of a new flood protection wall and reinstatement of the riverbank at the powerhouse and switchyard was eventually completed in early 2021. Completion of the riverbank protection works downstream of the intake had also commenced and are expected to be completed during the first half of 2022. Work to remediate a short section of the canal foundation as a result of an isolated landslide in November 2020, was also completed in 2021, which had resulted in substantial internal outages during Q1 2021.

2.1.4. Remaining Challenges

With all GET FiT supported projects now operational, the key remaining challenge is the completion of the long-term power evacuation infrastructure for several SHPs. Completion of the remaining power evacuation infrastructure is essential not only for enabling the SHPs to complete the remaining commissioning tests but also for substantially reducing the deemed energy obligations of Uganda Electricity Transmission Company Limited (UETCL), thereby minimising the cost of electricity to Ugandan consumers. Dedicated efforts from GET FiT to push for the resolution of the remaining issues and completion of the power evacuation infrastructure are ongoing (see Chapter 4 for more details).

Further follow-up of the last three commissioned SHPs as well as all other operational plants will be essential during 2022 to ensure that Programme requirements have been fulfilled and that procedures and protocols for the operating phase are appropriate. This will include checking the appropriateness of fish passage and migration arrangements as well as the management of community health and safety issues at some of the projects.

2.1.5 Overview of Portfolio Key Dates and Construction Durations

An overview of the timescales from GET FiT approval in principle to construction start and commissioning are provided in **Table 1** and **Figure 1** below. As expected, the solar PV projects, with their relatively limited infrastructure requirements and uncomplicated structures and equipment, were substantially quicker to implement from the point of gaining GET FiT approval in principle compared with the SHPs.

Table 1 | Overview of GET FiT approval in principle, construction start, and commissioning dates for GET FIT supported projects

Project	GET FIT approval in principle	Construction Start	Commissioning
Kakira CHP	Q3 2013	Q2 2012[1]	**Q2 2014**
Soroti Solar PV	Q4 2014	Q1 2016	**Q4 2016**
Siti 1 SHP	Q3 2013	Q1 2015	**Q2 2017**
Muvumbe SHP	Q1 2014	Q3 2015	**Q2 2017**
Tororo Solar PV	Q4 2014	Q1 2017	**Q3 2017**
Rwimi SHP	Q3 2013	Q3 2015	**Q4 2017**
Lubilia SHP	Q1 2014	Q1 2016	**Q2 2018**
Nkusi SHP	Q2 2015	Q2 2015	**Q2 2018**
Nyamwamba SHP	Q3 2013	Q4 2015	**Q2 2018**
Waki SHP	Q3 2013	Q2 2015	**Q4 2018**
Sindila SHP	Q4 2014	Q1 2017	**Q2 2019**
Siti 2 SHP	Q3 2013	Q3 2016	**Q3 2019**
Kyambura SHP	Q2 2015	Q3 2017	**Q3 2019**
Ndugutu SHP	Q2 2015	Q2 2017	**Q4 2019**
Nyamagasani 2 SHP	Q2 2015	Q1 2017	**Q1 2021**
Nyamagasani 1 SHP	Q2 2015	Q1 2017	**Q3 2021**
Kikagati SHP	Q3 2013	Q4 2017	**Q4 2021**[2]

[1] In 2012, Kakira Sugar Limited decided to expand their existing power co-generation plant. Financing was approved by the GET FiT Investment Committee in 2013.
[2] Commercial operation date formally recognised by UETCL as February 2022.

As indicated in **Figure 1**, the SHPs took on average 24 months from the point of GET FiT approval in principle to construction start and 34 months on average from construction start to COD, though the average duration was heavily skewed by four of the projects which took between 42 and 50 months. Ignoring those four SHPs, the average time from construction start to achieving commercial operation for the remaining 10 SHPs was 28 months.

At the appraisal stage, the forecast average construction duration of the GET FiT projects was 26 months. This was not achieved due to a wide range of reasons, including poor/limited early-stage studies and front-end engineering, underestimating challenges of steep terrain, limitations in contractor capacity/capability, in addition to the severe impacts that the COVID-19 pandemic and flooding event in May 2020 had on the three project still constructing in 2020 and 2021.

2.1.6 Consequences of Delayed CODs

The Steering Committee concluded in 2019 that all projects still under construction beyond the extended GET FiT Programme deadline of 31 October 2019[3] would remain eligible for GET FiT support, provided that the Developers of those projects agreed to a Developer Financing Agreement (DFA) addendum. The addendum stipulated that, for each full month of delay beyond 31 October 2019, a penalty of 5 % to the COD subsidy payment would be imposed. The addendum was agreed to by the developers of the three projects still constructing during 2020 – the Nyamagasani 1 and 2 SHPs and the Kikagati SHP – which will all be subject to these further reductions in the final subsidy amount.

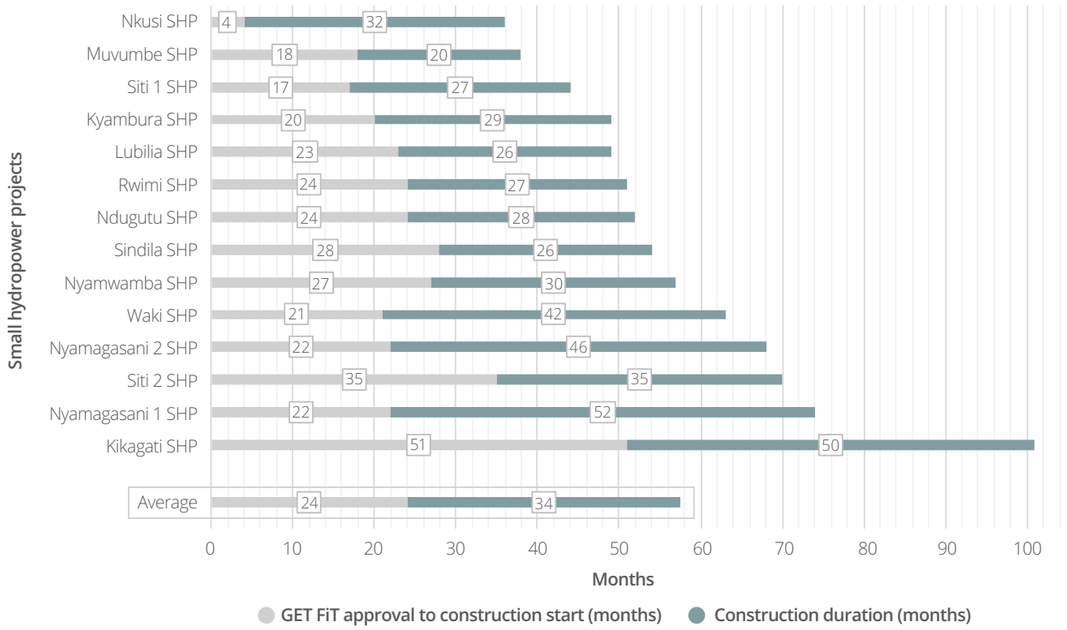


Figure 1 | Implementation timescales for hydropower projects from GET FiT approval to construction start and from construction start to commercial operation

[3] The GET FiT Steering Committee resolved in 2018 that, at the discretion of the GoU, represented by KfW, the contractual deadline for all projects still constructing beyond 31 December 2018 would be extended to 31 October 2019.

In September 2020, the Steering Committee further agreed that the DFA COD deadline might be extended where there are genuine and justifiable Force Majeure claims. The actual delay arising out of the Force Majeure events, and the associated magnitude of DFA COD deadline extension, was determined by GET FiT subject to legal review, assessment of progress on site, and decisions by UETCL and ERA with respect to the PPAs in early 2022. The cut-off date for final subsidy disbursements made under the GET FiT Premium Payment Mechanism (GFPPM) will, nevertheless, remain as 2023/24. For operational projects affected by Force Majeure events during 2020, the Steering Committee determined that the DFA term may be extended where justified, but no later than the 2023/24 cut-off date, and provided funding is still available at that stage.

2.1.7 Power Plant Performance in 2021

The timely implementation of new power evacuation infrastructure and upgrades to the existing grid continued to be a major issue for several of the SHPs during 2021. Of the 17 projects now operational, five SHPs had still only partially completed their full suite of commissioning tests as a result of a combination of grid and water availability related issues. In each case, improvements to the existing grid and/or the completion of new lines were ongoing and were required to enable power generation at full capacity. Unusually high grid outages also continued to be experienced at a number of the hydropower plants, with an average grid availability for all GET FiT supported projects during 2021 of approximately 84 % (similar to the 83 % reported in 2020). Further details can be taken from **Figure 2**.

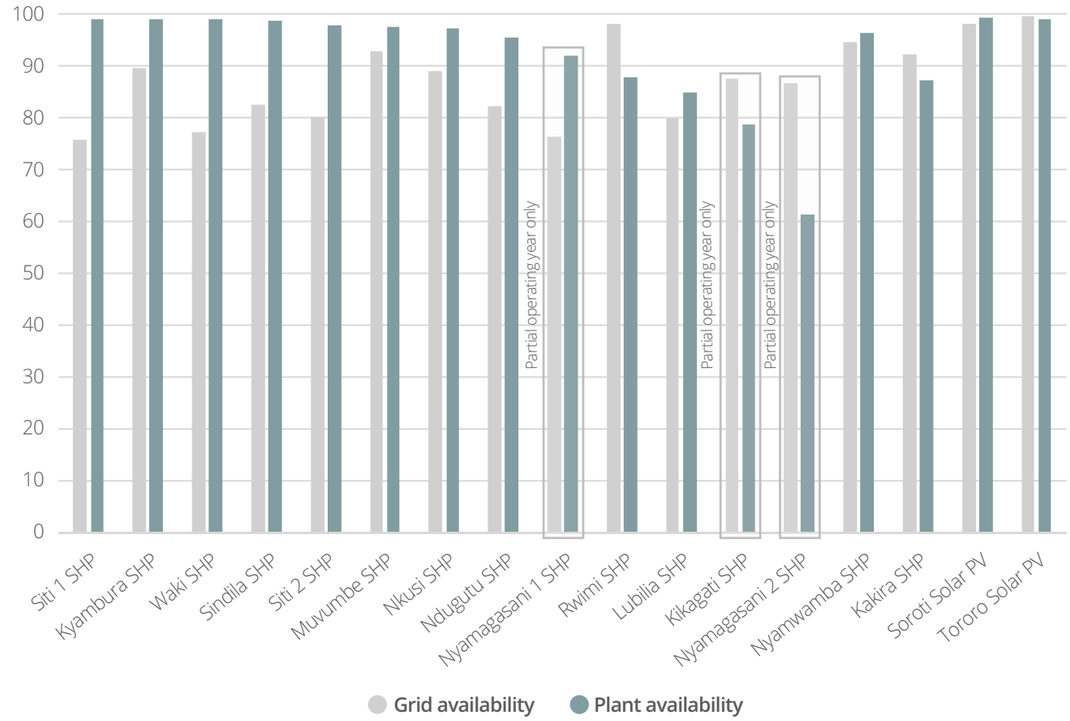


Figure 2 | Grid and plant availability during 2021 for all operational GET FiT supported projects[4]

[4] The Nyamagasani 1, Nyamagasani 2, and Kikagati SHPs started delivering electricity to the grid in February, August, and December 2021, respectively. The reported percentages therefore relate to the period between these respective dates and the end of December 2021.

The availability of the plants to generate electricity during 2021 was generally in line with the expected range for a portfolio of new generation projects. Excluding the three plants that were commissioned and started evacuating power to the grid in 2021, only three of the projects were substantially below the average plant availability across the portfolio – the Kakira cogeneration plant (combined heat and power plant – CHP) and the Lubilia and Rwimi SHPs. Generation at the Kakira CHP has been constrained since commencing commercial operation as a result of a low supply of sugar cane, which means that less bagasse is available for electricity production – this is discussed further in Section 2.2.1. The relatively low availability of the Lubilia SHP was predominantly a result of remedial works to the waterway following an isolated landslide in November 2020, whereas the lower availability at the Rwimi SHP was a result of a prolonged internal outage in order to remove accumulated sediments from the reservoir.

For the SHPs, the generation potential during 2021 was on average 94 %[5] of the annual generation estimated at the application stage – compared with 120 % in 2020 – indicating that 2021 was closer to an 'average' hydrological year. The key exceptions were the adjacent Sindila and Ndugutu SHPs, located on the western side of the Rwenzori Mountain range, and the Siti 1 and 2 SHPs located on Mount Elgon in the east of Uganda.

For the Sindila and Ndugutu SHPs, the energy potential in 2020 and 2021 was noticeably below the annual energy estimated for each plant at the application stage, indicating that the hydrological bases for the plants may be lower than expected. At the Siti 1 and 2 SHPs, generation in 2021 was approximately 66 % and 53 % of the annual generation estimated at the application stage, compared with 134 % and 139 % during 2020, which demonstrates the wide variation in hydrology that can occur from year to year. Further years of operation will improve certainty with respect to the energy potential of the GET FiT projects compared with the estimates made at the application stage.

The total energy delivered across the portfolio (including all 17 projects) during 2021 was 418 GWh, which represents 55 % of the total planned annual generation at the application stage. The cumulative total energy delivered since all projects were commissioned is almost 1.5 TWh. The total energy delivered per hydropower project is shown in **Figure 3**.

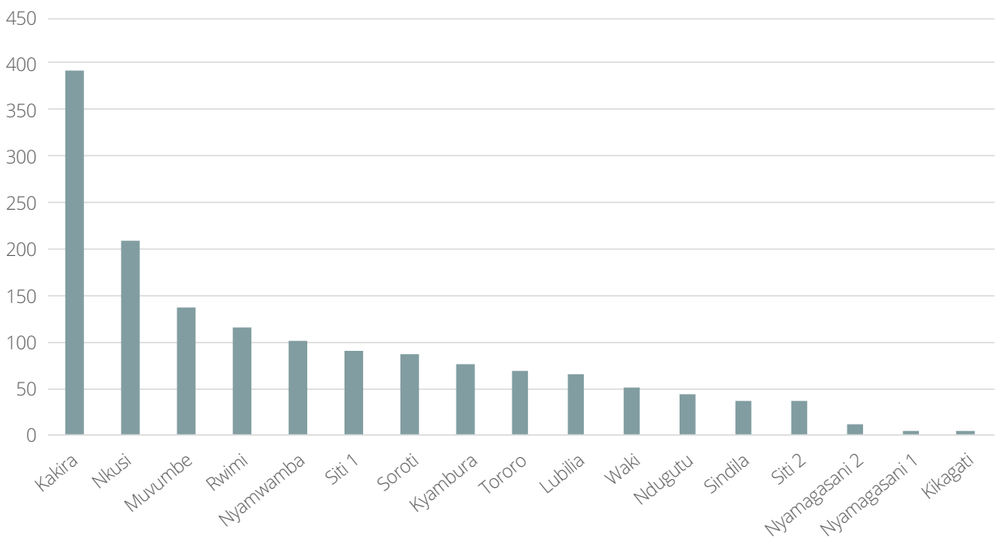


Figure 3 | Total energy delivered since commissioning per project

[5] The 94 % excludes the energy potential of the Nyamwamba and newly commissioned Nyamagasani 1 and 2 and Kikagati SHPs. Energy potential data for the Nyamwamba SHP are incomplete for 2020 due to the damage sustained to project structures as a result of the May 2020 floods. The 94 % furthermore includes estimated deemed energy values for the Waki SHP, as deemed energy is still to be reconciled with UETCL for 2020 and 2021.

2.1.8 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 4**. The overall portfolio capacity amounts to a total of 158.4 MW, representing approximately 93 % 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 almost 160 MW to the Ugandan electricity supply network is a significant achievement and highlights the successful impact of the GET FiT Programme.

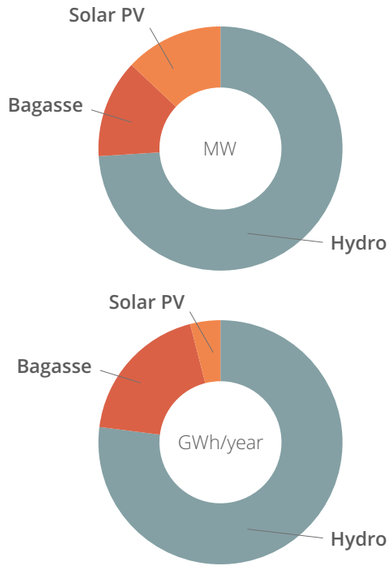


Figure 4 | GET FiT Portfolio Build Up

Figure 5 provides a schematic illustration of the merit order effect of the GET FiT portfolio, considering the current installed capacity of 158.4 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 Greenhouse Gas (GHG) emissions. GET FiT has increased the total generation capacity from renewable sources in Uganda, thereby reducing generation from the heavy fuel oil plants in the country. The Achwa 1 hydropower project – a non-GET FiT supported project – was commissioned in mid-2021, with a total installed capacity of 42 MW. This means that the effect of the GET FiT Portfolio on the country's energy supply remains largely the same as in the previous year. However, the commissioning of the 600 MW Karuma Hydropower Project is expected in 2022 – and based on ERA reporting, it is expected that Uganda will face a significant surplus generation capacity compared to demand in short to medium term.

Schematic Representation of Merit Order in 2021

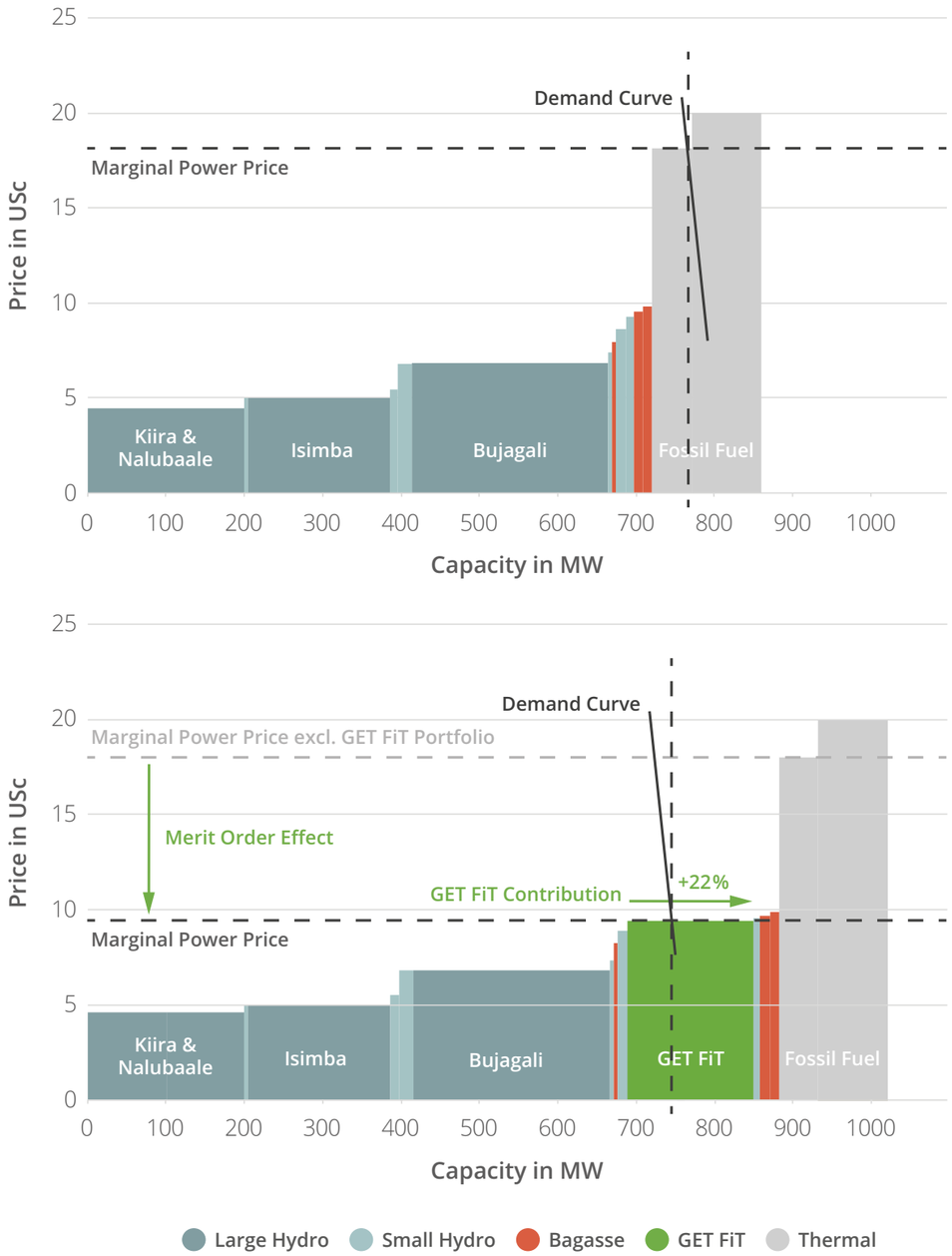


Figure 5 | Schematic Representation of Uganda's Merit Order and the Effect of the GET FiT Portfolio

Note: The merit order effect is expressed in marginal energy price, not average energy price. As the different power plants have different contractual agreements in terms of guaranteed production and payment, the illustration is only a schematic representation of the effects of the GET FiT Portfolio in the system. According to the schematic representation, the marginal power price in Uganda is much lower than it would have been without the portfolio in the power system. The 22 % increase in capacity by GET FiT refers exclusively to the renewable energy capacity. I.e. the energy demand in the country can be 22 % higher before the fossil-fuelled power plants need to start generation, compared to a scenario without the GET FiT Portfolio. The maximum demand in December 2021 was almost 800 MW. This has been used as demand in the schematic overview (for the scenario with the GET FiT Portfolio in the power system) (Source: https://www.era.go.ug/index.php/transmission/maximum-demand).

2.2 Projects

In the following sections, projects comprising the GET FiT portfolio are described in more detail, highlighting notable developments and power generation[6] in 2021. **Figure 6** provides an overview of the location of the respective projects of the portfolio. In the following project-individual section, annual generation includes deemed energy.

Figure 6 | Map of GET FiT Portfolio

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

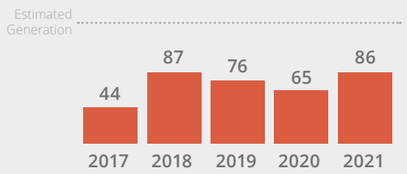
Kakira CHP

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 cogeneration plant (using bagasse from sugar production as feedstock), located in the Jinja District, Eastern Uganda, was the first operational project supported by GET FiT. Power production during the first years of operation was heavily constrained by the low availability of sugar cane caused by increased local competition over sugar cane from multiple new sugar factories. The sugar cane supply improved during the past few years, basically due to good weather and increased numbers of outgrower farmers, as well as the expansion of Kakira's own sugar cane production.

2021 was the second-best operational year for the Kakira plant, generating 86.4 GWh, which is still only 58 % of the estimated annual generation of 147 GWh. The project experienced multiple internal outages, including an unscheduled shutdown of a turbine for the purpose of a rotor replacement in November 2021. The monthly grid availability remained similar to previous years, varying between 88 % and 99 % availability, with the average grid availability over the year being 92 %.

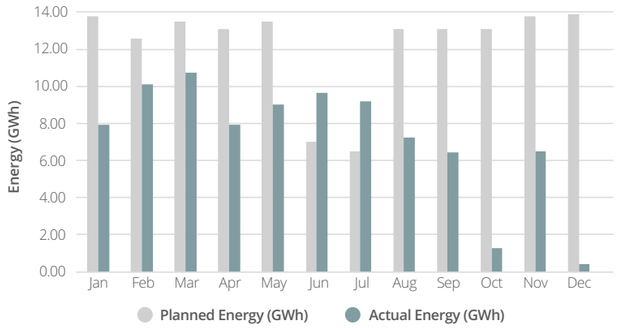


Figure 7 | Kakira Bagasse cogeneration plant – Planned versus Actual Energy Output (2021)

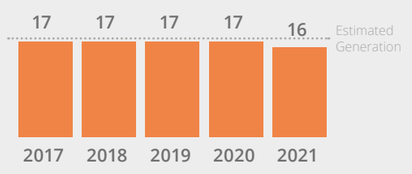
Soroti Solar PV

Operational

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)



The Soroti 10 MWp, Solar PV in the Soroti District in Eastern Uganda, was commissioned in November 2016. It was the second GET FiT supported project to be commissioned, the first grid-connected solar plant in Uganda, and was, at commissioning, the largest project of its kind in the East and Central African Region. The annual production has been very stable across the years and close to the planned output.

The total generation from the plant in 2021 was 15.7 GWh, which is slightly less than has been generated yearly since the first full years of operation in 2017. At commissioning, the average annual output was assessed to be 17.5 GWh, which is slightly more than the observed generation in the five years of operation. The deemed energy due to grid failure and grid maintenance was further reduced from 1.24 GWh in 2019 and 0.96 GWh in 2020 to 0.78 GWh in 2021. Without downtime of the grid, the total delivered energy could have been 16.5 GWh (93 % of estimated generation). The project reported a generally positive trend regarding the number and duration of grid outages.

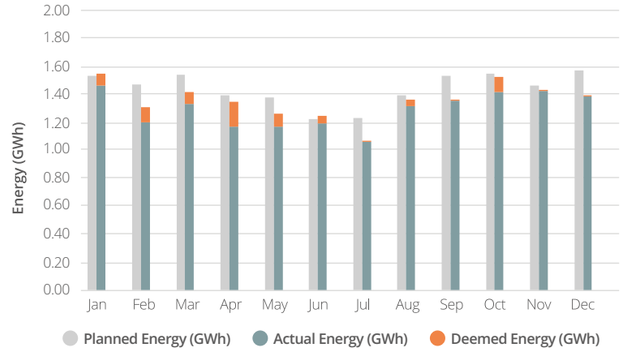


Figure 8 | Soroti Solar PV – Planned versus Actual and potential Energy Output (2021)

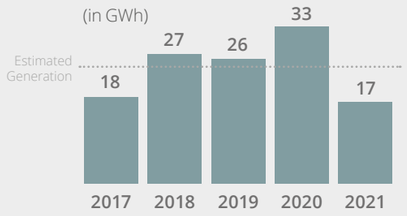
Siti 1 SHP

Operational

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)



This run-of-river hydropower plant in Bukwo District in Eastern Uganda has been operational since May 2017. In 2021, the project delivered 14.0 GWh of energy to the grid, substantially less than the estimated annual generation, resulting from a drier than average hydrological year and continued issues with grid availability.

Substantial grid failures and outages continued throughout 2021, with grid availability reportedly as low as 76 % on average. Whilst this represented an improvement compared with 2020 (grid availability of 58 %), lost generation due to grid availability accounted for approximately 15 % of the potential annual generation. More details are provided in Section 3.1.

Adjusting for the partial availability of the power evacuation line, the energy potential of the plant during 2021 would have reportedly been equivalent to 66 % of the average annual energy estimated at the GET FiT application stage. It seems 2021 was a substantially drier than average hydrological year, compared with a substantially wetter than average hydrological year in 2020, when the energy output (delivered plus deemed energy) was approximately 134 %. The plant availability during 2021 was 99 %, which is in line with expectations.

Despite the lower than expected generation in 2021, there has generally been high correlation during the first four full calendar years of operation (2018-2021 inclusive) between the forecast and actual energy (delivered plus deemed energy), with the plant averaging more than 102 % of the estimated annual generation per annum when accounting for grid availability.

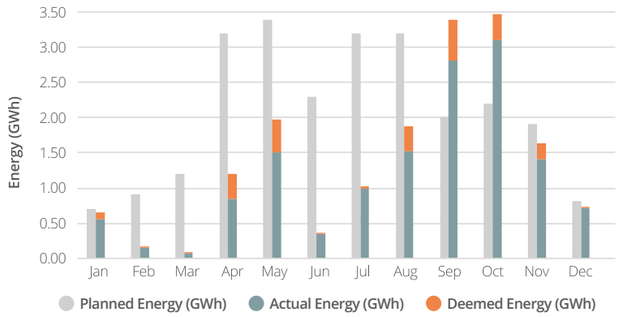


Figure 9 | Siti 1 SHP – Planned versus Actual Energy Output (2021)

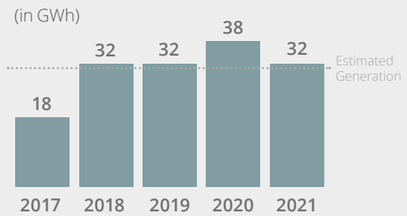
Muvumbe SHP

Operational

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)



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

In 2021, the Project generated 29.3 GWh. Combined with the energy generated since achieving commercial operation in 2017, the Project has contributed nearly 150 GWh of electricity to the Ugandan grid.

The grid availability has remained relatively consistent since the plant commenced commercial operations, with an average availability in 2021 of approximately 93 %. Adjusting for the partial grid availability, the cumulative plant generation would instead have been 31.7 GWh, approximately equivalent to 101 % of the average energy estimated at the application stage.

Since commencing commercial operations, there has generally been high correlation between the forecast and actual energy (delivered plus deemed energy). On average, the plant has generated more than 106 % of the estimated annual generation when accounting for grid availability during the first four full calendar years of operation (2018-2021 inclusive).

The plant has, however, suffered increased wear and degradation of key equipment since commencing commercial operations, primarily due to higher than expected suspended sediments in the river passing through the waterway and generating units. This has resulted in increased maintenance requirements and costs, though the reported operating expenditure (OPEX) is still within the expected range for a small hydropower project. Nevertheless, the plant was still available for generation for an acceptable 98 % of the time during 2021.

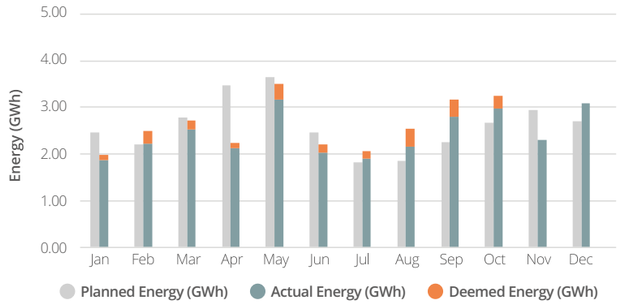


Figure 10 | Muvumbe SHP – Planned versus Actual Energy Output (2021)

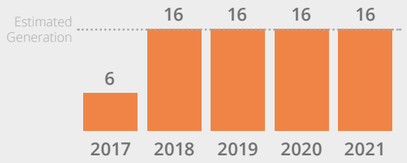
Tororo Solar PV

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 10 MWp Tororo Solar PV project in Tororo District, Eastern Uganda, commenced commercial operations in September 2017 and so became the second grid-connected solar power plant in Uganda. The project was developed by Building Energy, but in 2020 the majority shareholder changed to Red Rocket Africa.

The total generation from the plant in 2021 was 15.9 GWh, which is in line with the annual generation of previous years. At commissioning, the average annual output was assessed to be circa 16.0 GWh. Only minor deemed energy due to grid failure and grid maintenance was reported, amounting to 0.1 GWh in 2021. Without downtime of the grid, the total delivered energy could have been 16.0 GWh.

The facility operated to expected and forecasted performance levels, and there have been no major issues or concerns during the first four operational years. The grid availability averaged 99.6 % during 2021, with less than 35 hours of outage reported during the year.

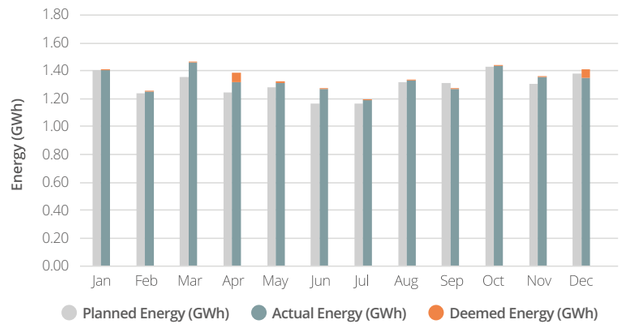
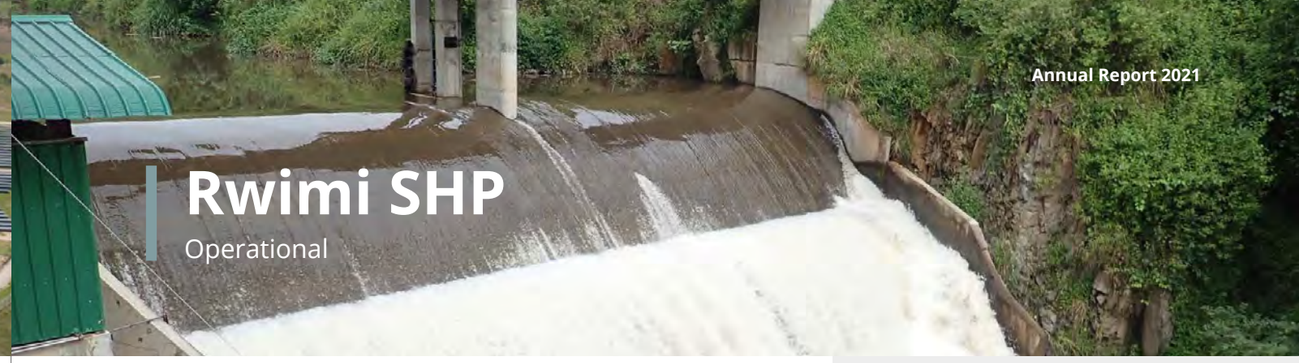


Figure 11 | Tororo Solar PV – Planned versus Actual Energy Output (2021)



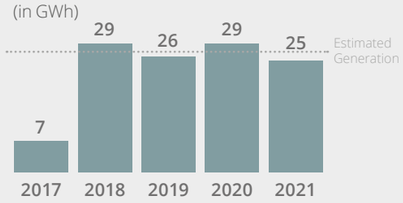
Rwimi SHP

Operational

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)



This run-of-river hydropower project in Kasese and Bunyangabo Districts in Western Uganda has been operational since October 2017.

In 2021, the project generated 25.0 GWh. Combined with the energy generated since achieving commercial operation in 2017, the project has contributed nearly 120 GWh of electricity to the Ugandan grid.

The plant continued to experience reportedly high volumes of debris accumulation at the dam and intake during 2021, as was experienced in 2020, as well as a substantial accumulation of sediment and debris in the reservoir, which required sustained efforts to clear. Combined with planned maintenance activities, this had the unusually large effect of reducing the plant availability to 88 %. Nonetheless, the plant still delivered 93 % of the average energy estimated at the GET FiT application stage to the grid. Adjusting for the reduced plant availability as well as grid outages, the plant would reportedly have been able to generate a combined 27.4 GWh during 2021, 101 % of the estimated annual average energy.

Since commencing commercial operation, the average annual generation appears to correlate highly with the estimated annual energy at the application stage, with the plant averaging nearly 102 % of the estimate per annum when accounting for grid availability.

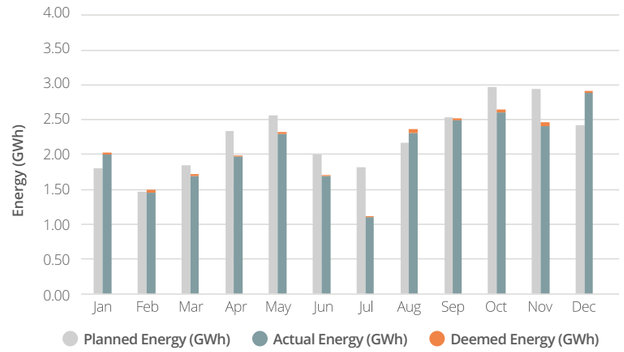


Figure 12 | Rwimi SHP – Planned versus Actual Energy Output (2021)

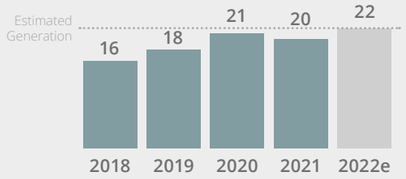
Lubilia SHP

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 in Kasese District in Western Uganda has been operational since early April 2018.

The plant delivered a total of 16.9 GWh of electricity to the Ugandan grid in 2021, noticeably lower than the planned annual generation as a result of substantial internal outages and grid availability issues. Substantial internal outages occurred during January and February, which were necessary to enable the completion of remedial repairs following a landslide along the headrace canal in November 2020. Combined with the planned maintenance works during 2021, internal outages resulted in an average plant availability for the year of 85 %, well below what would be expected from a hydropower plant of similar age.

The Project furthermore continued to experience substantial grid failures and external outages during the year, which resulted in missed generation approximately equivalent to 14 % of the total generation for the year (energy delivered plus deemed energy).

Accounting for both internal and external outages, the plant would reportedly have been able to generate a combined 23.6 GWh during 2021, approximately equivalent to 107 % of the estimated annual average energy. Based on the average annual generation since commencing commercial operation, the actual energy is closer to 89 % on average of the annual generation estimated at the application stage when accounting for grid availability (excluding the missed generation from prolonged internal outages).

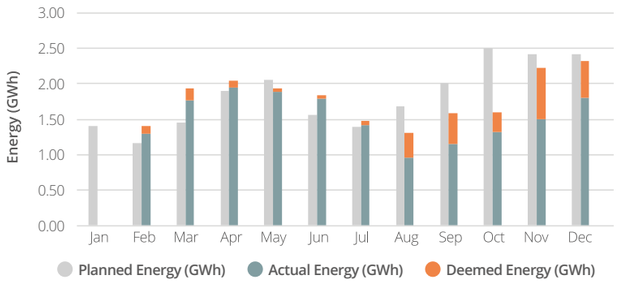


Figure 13 | Lubilia SHP – Planned versus Actual Energy Output (2021)

Nkusi SHP

Operational

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

In 2021, the Project generated 68.8 GWh. Combined with the energy generated since achieving commercial operation in 2018, the Project has contributed more than 200 GWh of electricity to the Ugandan grid – the largest contribution from a single small hydropower project within the portfolio.

Internal outages during 2021 due to scheduled maintenance were higher than expected for a plant of this age, though the reported plant availability of 97 % was still acceptable. Grid failures and external outages continued to be an issue, which resulted in an average grid availability of 89 % and missed generation approximately equivalent to 11 % of the potential plant output (energy delivered plus deemed energy). Power evacuation arrangements were modified during the period, which reportedly helped to reduce grid losses, improve grid availability, and thus enable the plant to generate and evacuate greater energy with reduced deemed energy claims and should continue to yield improvements moving forward.

Adjusting for external outages, the plant would have been able to generate a combined 77.3 GWh during 2021, approximately equivalent to 168 % of the average annual energy estimated at the GET FiT application stage. Since commencing commercial operation, the actual energy has, on average, been 153 % of the annual estimate when accounting for grid availability, indicating that there is potential for a higher installed capacity at the site.

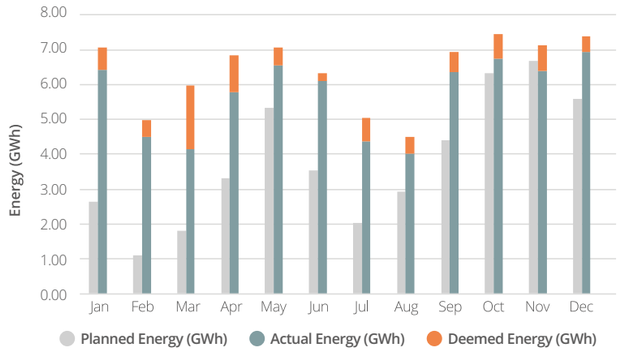
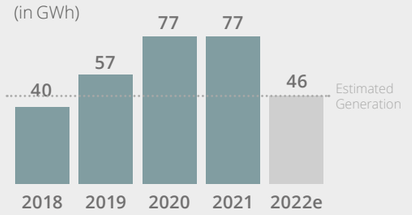


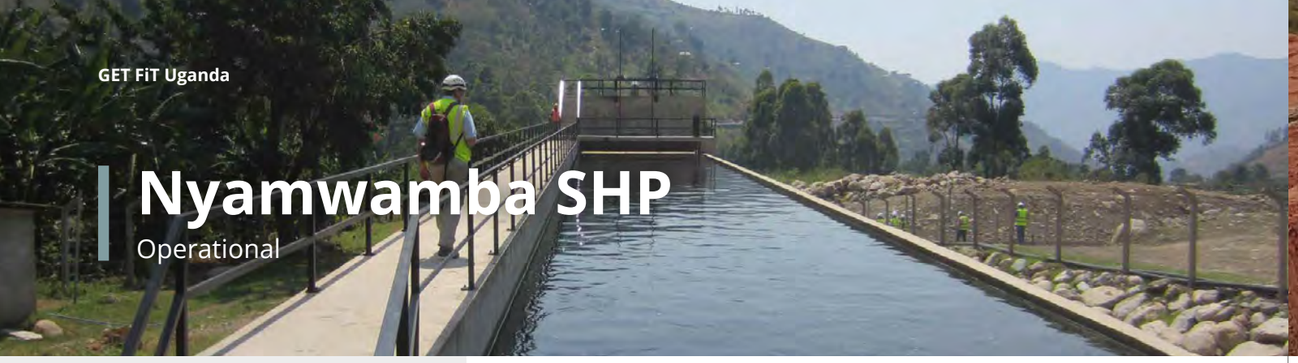
Figure 14 | Nkusi SHP – Planned versus Actual Energy Output (2021)

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)





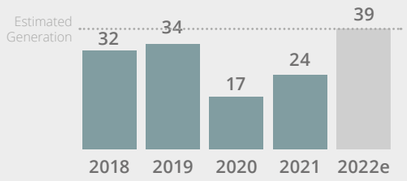
Nyamwamba SHP

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 April 2018.

In May 2020, the plant experienced a major flood resulting in substantial damage to key project structures and unplanned outages lasting several months. Key structures were subsequently reconstructed or repaired, and equipment was replaced in the powerhouse. The plant recommenced operations in early October 2020, having salvaged parts from all three generation units to assemble a single generating unit.

Further equipment was replaced during 2021, with all three generating units having been fully restored as of June 2021. Plant availability during 2021 was therefore also affected by the recovery efforts, with an average availability of 96 %. Furthermore, the May 2020 floods resulted in a substantial change in the nature of sediments being transported by the Nyamwamba River, which had necessitated changes in operating protocols and further losses in generation. Nevertheless, the plant still delivered 23.4 GWh to the grid in 2021.

Adjusting for internal and external outages, the plant would have been able to generate a combined 27.0 GWh during 2021, approximately equivalent to 69 % of the average annual energy estimated at the GET FiT application stage.

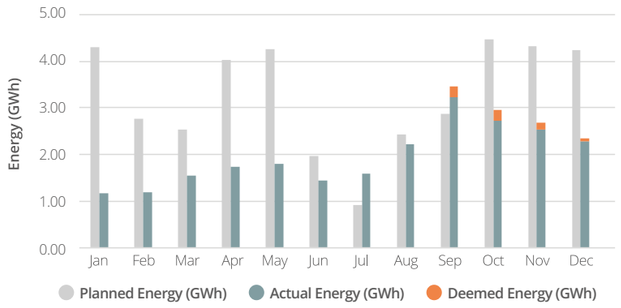


Figure 15 | Nyamwamba SHP – Planned versus Actual Energy Output (2021)

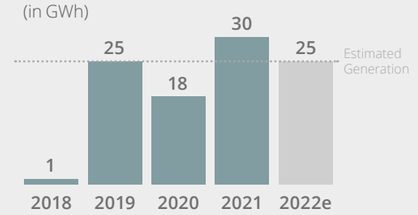
Waki SHP

Operational

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)



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

Whilst the plant's availability to generate during 2021 was good at 99 %, the grid availability was only 77 %. Grid availability has been consistently poor since the plant commenced commercial operation. Nevertheless, the project still delivered 18.3 GWh of electricity to the grid in 2021.

The deemed energy amounts the plant is eligible for during grid outages have not yet been approved for 2020 or 2021 due to previous concerns regarding the method of measuring deemed energy. An alternative methodology has since been developed by the plant owner in conjunction with UETCL, which is expected to be approved in 2022.

Until the deemed energy quantities for 2020 or 2021 are approved, the energy potential of the plant during both years remains unconfirmed. However, based on available data, the plant is expected to have had a generation potential during 2021 of 126 % compared with the estimated annual generation. This correlates well with the annual energy the plant has delivered on average during the first three full years of operation of 127 %.

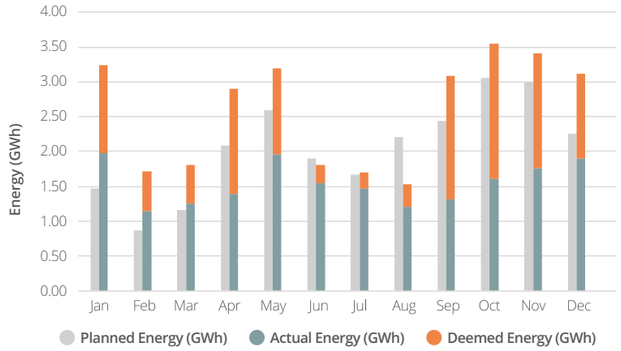


Figure 16 | Waki SHP – Planned versus Actual Energy Output (2021)

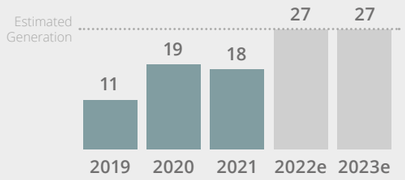
Sindila SHP

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 in Bundibugyo District in Western Uganda was developed in parallel with the Ndugutu SHP, located on an adjacent river basin (also supported by GET FiT).

The plant commenced commercial operations in May 2019 but has since been unable to complete the full suite of commissioning tests due to a combination of limited available water and grid constraints. Grid availability during 2021 was poor at 82 % on average, with the plant experiencing more than 100 hours of outage per month on average. Grid constraints furthermore continued to effectively limit the combined output from the Sindila and adjacent Ndugutu SHPs to a combined approximately 8 MW.

The high volume of grid outages provides the plant operators with sufficient opportunity to undertake maintenance. Internal maintenance outages are therefore kept to a minimum, with a resulting plant availability during 2021 of 99 %.

Adjusting for internal and external outages, the plant would have been able to generate a combined 17.7 GWh during 2021, approximately equivalent to 66 % of the average annual energy estimated at the application stage. This is comparable with the average actual energy from the first two full calendar years of operation of 68 %, indicating that the hydrological basis for the plant may be lower than expected, though further years of operation are necessary to draw firm conclusions in this regard. Information on the grid connection is provided in Section 3.1.

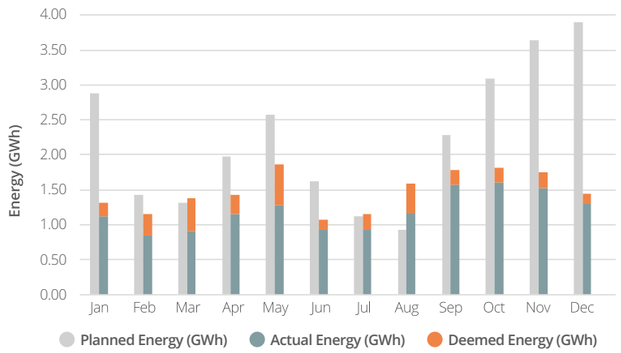


Figure 17 | Sindila SHP – Planned versus Actual Energy Output (2021)

Siti 2 SHP

Operational

This run-of-river hydropower plant in Bukwo District in Eastern Uganda has been operational since July 2019. In 2021, the project delivered 27.9 GWh of energy to the grid, substantially less than the estimated annual generation, resulting from a drier than average hydrological year and continued issues with grid availability.

The long-term power evacuation solution, comprising a new 132 kV transmission line (see Siti 1 SHP in Section 2.2.3), is expected to be completed by 2024. In the interim, the plant was connected to a new 130 km long 33 kV line at the end of 2020. Despite the increased power evacuation capacity, the plant had still not been able to complete the full suite of commissioning tests during 2021 due to grid constraints. However, as a result of the interim power evacuation solution and lower than expected hydrology, deemed energy claims during 2021 accounted for 25 % of the potential annual generation, significantly reduced from 93 % during 2020.

Adjusting for the partial availability of the power evacuation line, the energy potential of the plant during 2021 would have reportedly been equivalent to 53 % of the average annual energy estimated at the application stage. The plant availability during 2021 was 98 %, which is acceptable, and therefore the plant appeared to have experienced a substantially drier than average hydrological year (similar to Siti 1 SHP), compared with a substantially wetter than average hydrological year in 2020, when the energy potential was approximately 139 %. On average, the plant has therefore generated approximately 96 % of the estimated annual generation per annum during the first two full calendar years of operation, when accounting for grid availability.

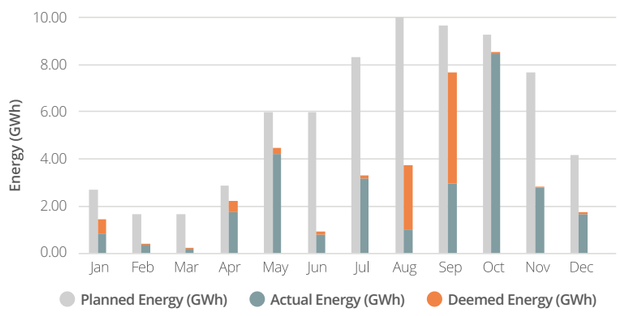
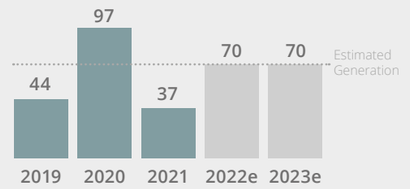


Figure 18 | Siti 2 SHP – Planned versus Actual Energy Output (2021)

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)



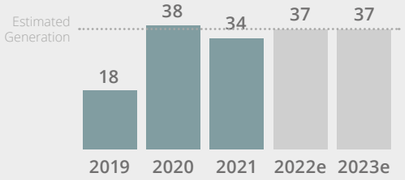
Kyambura SHP

Operational

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)



This run-of-river hydropower plant in the Rubirizi District in Western Uganda has been operational since July 2019.

In 2021, the Project delivered 26.5 GWh of electricity to the Ugandan grid. The plant availability during 2021 was 99 %, which is in line with the upper end of the expected range for a new SHP, whilst grid availability was comparable to 2020 at 90 %.

Grid failures and external outages resulted in generation losses approximately equivalent to 21 % of the potential plant output for the year (energy delivered plus deemed energy), substantially higher than the 12 % experienced in 2020. Adjusting for the partial availability of the power evacuation line, the cumulative energy output of the plant during 2021 would have been 33.69 GWh, approximately equivalent to 92 % of the annual average energy estimated at the application stage.

Since commencing commercial operation, there has generally been high correlation during the first two full calendar years of operation (2020-2021 inclusive) between the forecast and actual energy (delivered plus deemed energy), with the plant averaging more than 98 % of the estimated annual generation per annum when accounting for grid availability.

In February 2021, a range of stakeholders downstream of the Project complained about substantial numbers of dead fish in the river. While the exact cause of the fish mass death incident is not confirmed, it appeared to be related to the Project's sediment flushing (see Section 3.3 for more information).

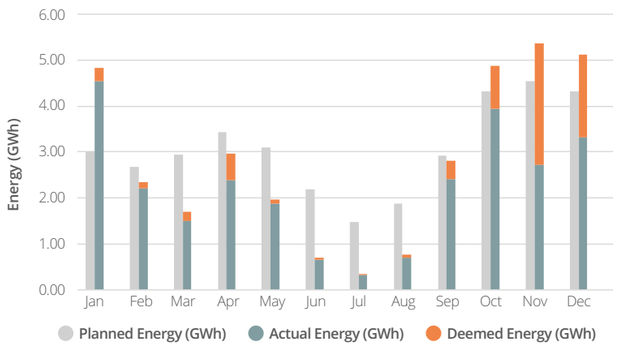


Figure 19 | Kyambura SHP – Planned versus Actual Energy Output (2021)

Ndugutu SHP

Operational

This run-of-river hydropower plant in the Bundibugyo District in Western Uganda was developed in parallel with the Sindila SHP, located on an adjacent river basin (also supported by GET FiT).

The plant commenced commercial operations in October 2019 but has since been unable to complete the full suite of commissioning tests due to a combination of limited available water and grid constraints. Grid availability during 2021 was poor at 82 % on average, with the plant experiencing more than 100 hours of outage per month on average. Grid constraints furthermore continued to effectively limit the combined output from the Sindila and adjacent Ndugutu SHPs to a combined 8 MW.

The plant experienced substantial internal outages during 2021 due to damage to one of the generating units and subsequent investigations and replacement of key components. Due to a lack of water availability, however, the internal outages resulted in only just over 0.5 GWh of lost generation.

Adjusting for the partial availability of the power evacuation line, the potential plant generation during 2021 would have been 22.3 GWh, approximately 84 % of the annual average energy estimated at the application stage. This is comparable with the average actual energy from the first two full calendar years of operation of 87 %, indicating that the hydrological basis for the plant may be lower than expected, though further years of operation are necessary to draw firm conclusions in this regard.

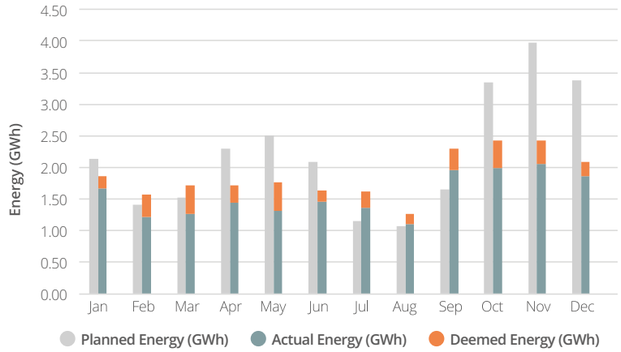
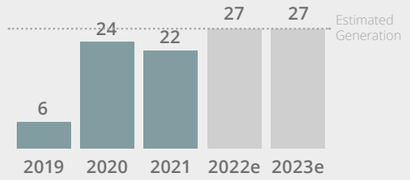


Figure 20 | Ndugutu SHP – Planned versus Actual Energy Output (2021)

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)



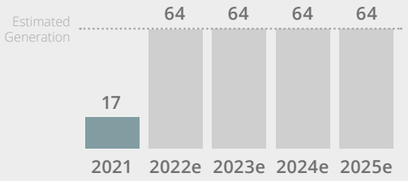
Nyamagasani 1 SHP

Operational

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

Annual Generation
(in GWh)



This run-of-river hydropower plant in the Kasese District in Western Uganda achieved commercial operation in 2021, following 53 months of construction.

The failure of a key project structure in early 2021 at the downstream Nyamagasani 2 SHP – a project also approved for GET FiT support and implemented by the same developer and EPC contractor team – led to a design and construction review of similar structures at the Nyamagasani 1 SHP, however, which resulted in subsequent modifications and further delays. The plant was eventually able to complete commissioning tests and commence commercial operation in August 2021, with commissioning possible only via a new temporary interconnecting line to the grid (see Nyamagasani 2 SHP update in the following section for details). Constraints on the interim connection prevented the full suite of commissioning tests from being completed, however, and the remaining tests will need to be concluded once the long term power evacuation solution has been installed. More details are provided in Section 3.1.

Since commencing commercial operation, the plant was able to generate 5.48 GWh, with grid outages reportedly resulting in approximately 12.0 GWh, equivalent to a combined 68.7 % of the generation potential.

Further follow-up of the plant is required early during 2022 to ensure that GET FiT requirements have been fulfilled, including checking that procedures and protocols for the operating phase are appropriate.

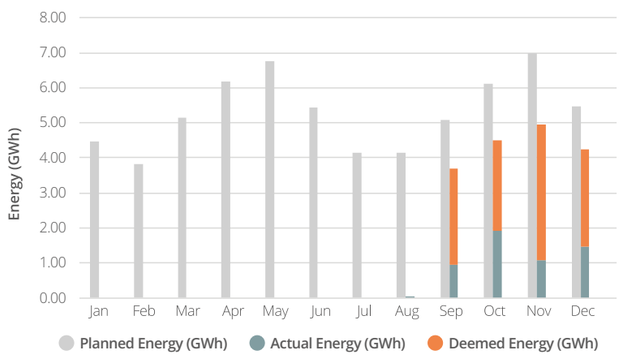


Figure 21 | Nyamagasani 1 SHP – Planned versus Actual Energy Output (2021)

Nyamagasani 2 SHP

Operational

This run-of-river hydropower plant in the Kasese District in Western Uganda was developed as part of a cascade just downstream of the Nyamagasani 1 SHP – a project also supported by GET FiT and implemented by the same developer and EPC contractor team.

The construction of key project structures and commissioning tests were completed and the plant synchronised to the grid in February 2021. The plant was commissioned via a new temporary interconnecting line, which required minor upgrades to the existing grid to overcome significant capacity constraints. Refer to Section 4.3 for an update on the planned long-term power evacuation infrastructure.

Shortly following the commencement of commercial operations, the penstock anchor block – a key project structure – failed, and a subsequent design and construction review identified the need to implement modifications to several structures. The failure, design review, and subsequent modifications resulted in substantial internal outages, with operations not able to recommence until June 2021. Nevertheless, since commencing commercial operation, the plant was able to generate 9.36 GWh, with grid outages reportedly resulting in approximately 3.54 GWh, which combined is equivalent to 27.5 % of the generation potential.

Further follow-up of the plant is required early during 2022 to check that GET FiT requirements have been fulfilled, including checking that procedures and protocols for the operating phase are appropriate, as well as completion of arrangements for upstream and downstream fish passage.

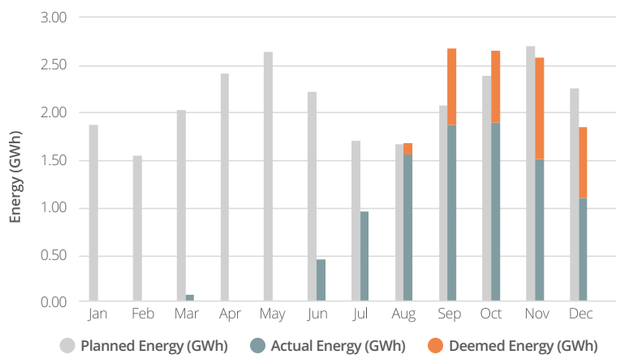


Figure 22 | Nyamagasani 2 SHP – Planned versus Actual Energy Output (2021)

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

Annual Generation
(in GWh)

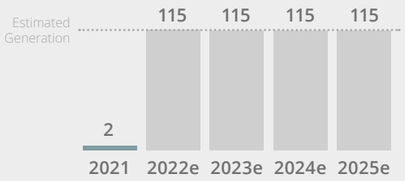
Kikagati SHP

Operational

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

Annual Generation
(in GWh)



The Kikagati-Murongo run-of-river hydropower plant on the Kagera River is located in Isingiro District in South-western Uganda on the border with Kyerwa District in North-Western Tanzania. The plant is unlike all other SHPs in the GET FiT portfolio due to the characteristics of the site with the powerhouse located at the dam. This arrangement results in a minimal waterway length and flows being diverted through the powerhouse and directly into the river downstream of the dam. The dam creates a barrier to upstream fish migration in the largest river flowing into Lake Victoria, and a fish passage is therefore provided to enable ecological connectivity between Lake Victoria and the Kagera River system.

The global COVID-19 pandemic continued to adversely impact the construction progress of the plant during 2021 in terms of restrictions to the workforce size that could be accommodated on-site, infection rates, and site quarantine procedures. Nevertheless, the remaining key design issues were finally resolved in 2021 and construction progress thereafter was commendable. Following 50 months of construction, all three generating units were eventually ready for synchronising to the grid by December 2021, resulting in Kikagati being the final GET FiT supported project to achieve commercial operation. During the first partial month of operation, the plant was able to generate 2.3 GWh of electricity for the Ugandan grid. Further follow-up of the plant is required early in 2022 to check that GET FiT requirements have been fulfilled, including checking that procedures and protocols for the operating phase are appropriate, including upstream and downstream fish migration (see Section 3.3 for more information).

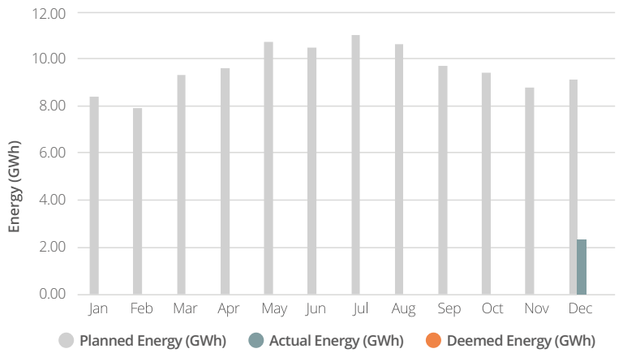


Figure 23 | Kikagati SHP – Planned versus Actual Energy Output (2021)

03 Grid Connection & Technical Assistance

3.1 Portfolio Overview

In 2021, the GET FiT portfolio experienced both setbacks and achievements in the grid integration and power evacuation of commissioned projects. Deemed energy[7] claims continued to pose significant challenges across the project portfolio, accounting for about 15 % of potential annual generation due to inadequate grid infrastructure. Further, the three projects commissioned in 2021 have only achieved deemed COD due to insufficient grid connection and capacity to evacuate power.

The graph below highlights the actual energy production plotted against the expected/projected energy at the appraisal stage, and the approved deemed energy claims by project.

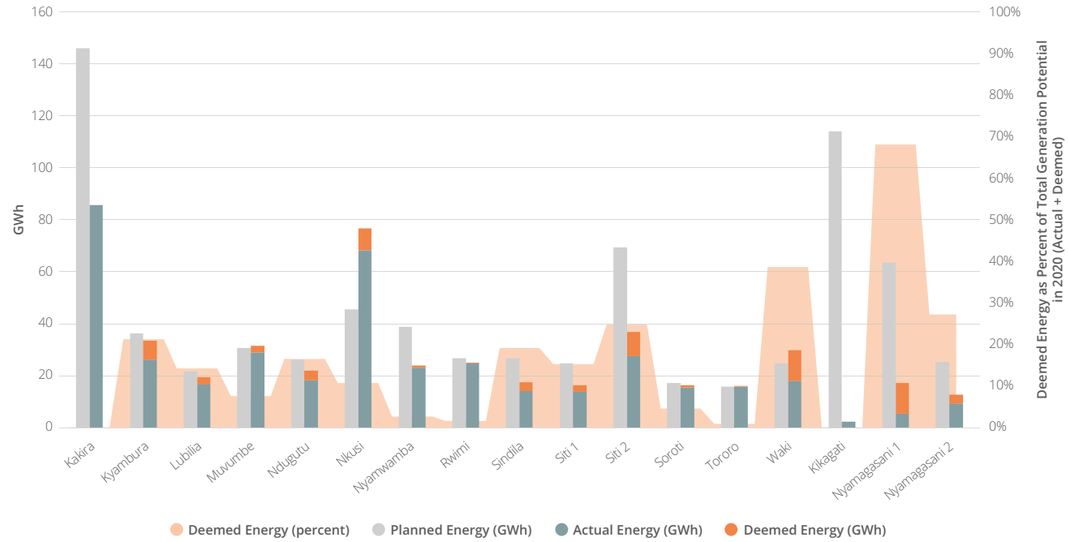


Figure 24 | Planned, Annual and Deemed Energy Generation from GET FiT Projects in 2021[8]

3.2 Specific Challenges and Interventions

Figure 24 shows a wide variation of deemed energy claims across the portfolio. There have been joint efforts by Ugandan governmental agencies, GET FiT development partners and project developers to mitigate power evacuation issues within and beyond the programme. We present here some of the specific challenges for selected projects with high deemed energy claims and some interventions made by various stakeholders to address them in the past year.

[7] Energy that a generation facility is prevented from delivering to the off-taker due to grid unavailability or limited demand.
[8] The Nyamagasani 1, Nyamagasani 2, and Kikagati SHPs started delivering electricity to the grid in February, August, and December 2021, respectively. The reported actual energy and deemed energy percentages therefore relate to the period between these respective dates and the end of December 2021.

Siti 1 & 2 SHPs
The 6.1 MW Siti 1 and 16.5 MW Siti 2 SHP were, since the commissioning of the latter in July 2019, both evacuated through a 33kV line connected to a distribution grid operated by Uganda Electricity Distribution Company Limited (UEDCL). The connection provided limited evacuation capacity for both projects, resulting in high deemed energy claims. A new dedicated 130 km 33 kV line from the projects to Mbale substation was constructed and completed by Umeme (Uganda's main electricity distribution company) in December 2020, after approval of funding by ERA.

The commissioning of the new line resulted in a 73 % reduction in deemed energy claims by Siti 2 alone between 2020 and 2021, representing over USD 5 million in annual savings. There remain technical constraints on the line due to its long distance at medium voltage and high technical losses, which limit the total evacuation to approximately 12 MW, hence deemed energy is still an issue. This will be mitigated by the commissioning of the 132 kV Mbale – Bulambuli transmission line, whose timeline for completion by UETCL is unclear.

Nkusi SHP
The power evacuation of the 9.6 MW Nkusi SHP through the UEDCL-operated network in the North-Western Service Territory has been characterised by high technical losses since the project's commissioning in June 2018. As a result, UEDCL imposed a cap of 6 MW on the plant's generation in 2019 to mitigate losses. In order to address the network constraints, 31 km of the 235 km network was upgraded from 100 mm2 to 150 mm2 conductors in 2020.

Joint efforts by the System Planning and Coordination Committee (SPCC), comprised of ERA, UETCL, UEDCL, Umeme and the Ministry of Energy and Mineral Development (MEMD), and the developer, led to the implementation of an evacuation split for the plant's two units (2 x 4.8 MW) towards Hoima and Fort Portal respectively. The implementation of the split was completed in August 2021. Additionally, the developer and UEDCL deployed a grid oversight team to monitor the network's performance. The interventions resulted in a 50 % reduction in the network technical losses, improved grid reliability and the removal of the 6 MW generation cap.

The remaining areas of improvement include the installation of switches to isolate long T-offs for better line protection, the timely changeout of old poles and small conductor sections by UEDCL, installation of a UEDCL Supervisory Control and Data Acquisition (SCADA) system and regular line clearances.

Waki SHP
The 4.8 MW Waki SHP, commissioned in December 2018, reported improvements in the performance and reliability of the UEDCL-operated network in Hoima during 2021. This was mainly attributed to the rehabilitation of the Hoima – Masindi 33kV line by Umeme during the reporting period.

Some technical problems remained, however, including inadequate line protection due to lack of air break switches and inability to remotely operate auto-reclosers for efficient line restoration, old distribution line poles, faulty distribution transformers and delays in bush clearance along the distribution line routes. These contributed to the project's deemed energy claims in the past year. Engagements with UEDCL are ongoing to address the remaining grid issues.

Sindila & Ndugutu SHPs
The 5.3 MW Sindila and 5.9 MW Ndugutu SHPs in Bundibugyo both recorded high deemed energy in 2021. The existing evacuation line has limited capacity to evacuate both projects. The production from each project is limited to approximately 3 MW by the grid protection settings in place to mitigate network losses.

Additionally, the over 100 km 33 kV line to Fort Portal is highly unreliable and prone to frequent outages. The grid performance is expected to improve after the construction of new lines and reinforcements to the existing grid by the Rural Electrification Programme (REP) with support from the GET FiT interconnection component.

Nyamagasani 1 & 2 SHPs
The commissioning of Nyamagasani 1 & 2 in 2021 caused increased technical losses on the area grid due to the limited capacity of the existing 33kV lines to fully evacuate power from both projects. The combined generation of the two projects was capped at 7MW (out of 20 MW) in 2021 in order to mitigate the losses. The planned construction of dedicated evacuation infrastructure from Nyamagasani 2 to the Nkenda substation, under the GET FiT interconnection component, is expected to resolve the technical issues.

3.3 GET FiT Interconnection Support

The GET FiT interconnection support, funded by the UK Foreign, Commonwealth & Development Office (FCDO), has provided financial assistance to the Government of Uganda (GoU) for a) the reinforcement of critical grid infrastructure and b) technical assistance to ERA. The status of the different components, including funding commitments, is presented below.

3.3.1 Grid Infrastructure Reinforcements

Upgrade of Opuyo Substation
This component provided support to UETCL to upgrade the capacity of the Opuyo transmission substation from a single 20 MVA transformer to two 40 MVA transformers. The objective was to improve the reliability of grid integration for existing and planned renewable energy projects in Eastern Uganda, including the operational 10 MW Soroti Solar PV project.

The construction started in May 2018, and the new substation was commissioned in September 2021. The construction completion was partly delayed by the COVID-19 pandemic, as well as implementation challenges faced by the EPC contractor, particularly related to the civil works.

Reinforcement of Distribution Grids in Western Uganda
The support to 33 kV grid reinforcements in Western Uganda through the MEMD Rural Electrification Programme (REP) is aimed at ensuring adequate grid integration and power evacuation of five GET FiT projects: Sindila and Ndugutu SHPs (Lot A) in Bundibugyo district; and Nyamagasani 1, Nyamagasani 2 and Lubilia in Kasese district (Lot B), with a combined capacity of 37 MW.
Lot A involves the construction of 104 km of new 33 kV lines from Bundibugyo to Fort Portal, and Lot B the construction of 126 km of lines from the Nyamagasani 2 project site to Nkenda substation in Kasese. The implementation of the lines commenced in August 2018 with the procurement of EPC contractors for the respective lots.

The start of construction has been extensively delayed due to challenges with the Resettlement Action Plan (RAP) implementation according to international Environmental and Social Standards (ESS) and related delays in the assessment and disbursement of required wayleaves compensation funds by REP / GoU. The RAP challenges resulted from the high wayleaves costs in the corridor of the initial line routes for both lots. International ESS require that compensation payments are made to Project Affected

Persons (PAPs) prior to the start of construction. The routes were optimised, and some sections were diverted from densely populated areas and protected sites during 2020/21 to mitigate the high wayleaves costs. This required a reassessment of wayleaves costs in the diverted route sections and associated technical line re-designs.

The technical designs for the optimised line routes were completed by the EPC contractors and supervision consultant in 2021. Additionally, partial compensations payments were made by REP to a small number of PAPs along the sections that had already been assessed but not diverted, for both lots. This followed the disbursement of part of the compensation funds by GoU to REP, pending the assessment of wayleaves compensations for PAPs in diverted line route sections. The latter assessment was delayed in part by the integration of the Rural Electrification Agency (REA) into MEMD (and becoming REP) during 2021, which in turn delayed the approval of the valuation process by the procured consultant. The process was approved by MEMD in January 2022.

The full compensation funds are expected to be disbursed to REP by GoU after the PAP valuations have been approved by the Chief Government Valuer (CGV). It is uncertain when the CGV valuation approval will be concluded so that the remaining funds can be disbursed by the GoU. The REP estimates that compensations will be made to PAPs in Q2 2022, after which line construction will commence. The Government, through MOFPED, has committed to prioritise and avail the compensation funds once the valuations are completed by MEMD / REP.

Concerted efforts by the responsible GoU agencies, with support from the GET FiT development partners, will be important to ensure that the implementation of the grid reinforcements is timely to avert the increased risk of continued deemed energy obligations to the Government.

3.3.2 Technical Assistance to ERA

The GET FiT Programme has supported regulatory capacity building initiatives at ERA through the Technical Assistance Facility since 2013. Details of previously implemented Technical Assistance (TA) and its impact on ERA's regulatory function are documented in earlier annual reports available at **https://www.getfit-uganda.org/annual-reports/.**

Regulatory Information Management System (RIMS)

The objectives of the RIMS are to enhance the efficiency of ERA's information collection and data processing activities, automate regulatory analysis and compliance monitoring, and facilitate stronger web-based stakeholder engagements for effective service delivery.

The development of the RIMS at ERA was commenced in May 2018 with the procurement of a consultant to design the system specifications, followed by the procurement of the system developer in 2020. The system development is ongoing. The procurement of hardware for the ERA data centre was completed in September 2021. As of 31st December 2021, the overall RIMS project development was at 53 % to implementation completion. The Solution Requirement documentation had been completed, and the contractor had developed the first draft RIMS prototype based on the solution requirements. The system aims to shift several of ERA's regulatory functions online, including applications for licences, feasibility permits, grid extensions, monitoring and compliance, etc. It was previously expected to go online in Q3 2021, but due to delays partly related to the pandemic, it is now expected to go live in Q4 2022.

ERA has successfully solicited additional funding of USD 1.5 million from the World Bank to implement the next phase of the RIMS. This will include advanced functionalities, such as real-time tariff calculations, a uniform system of accounts for licensees, Human Resource functionalities, etc.

Beyond the scope of the TA provided by GET FiT and the World Bank, the system requires additional funding for the procurement and installation of a back-up hardware and software system to secure the full-time online availability of the system to all stakeholders. The estimated funding requirement for the backup system, which is to be solicited by ERA, is reported to be approximately USD 100 000.


GET FiT Uganda

04 Environmental & Social Performance

4.1 Bumps in the Road and Substantial Improvements

Sound management of environmental and social (E&S) risks protects the environment and safeguards workers as well as project-affected people. Therefore, 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). Because the IFC PS act as a global benchmark and is widely applied by international financing institutions and private investors, these standards are a convenient common reference for a multi-donor funded initiative like GET FiT.

Since its launch in 2013, the GET FiT Programme has had the privilege of following projects and project developers from site identification, through design and construction, until the present day, where the developers of 17 operational renewable energy projects can feed a multitude of lessons into the conceptualisation and development of new projects for a low-carbon future. The environmental and social compliance journey has been a bumpy road at times, more so for some developers and projects than others. There have been many discussions on required corrective actions, several letters written to the same effect, construction activities temporarily stopped at some projects, one project having its GET FiT approval withdrawn, financial penalties imposed through GET FiT subsidy reductions, as well as otherwise viable applicant projects not being approved by GET FiT due to highly flawed environmental and social studies and risk management plans.

These bumps in the road aside, there is no doubt that the environmental and social risk management capacity and performance of project developers, including on health and safety, have improved substantially over the years. There are now substantially reduced project risks and a considerably higher degree of compliance with Ugandan regulations and international standards than would otherwise have been observed. Local people and nature in the project areas have benefitted greatly from these improvements. It is also unquestionable that without the highly committed support from both ERA and the GET FiT donors to environmentally and socially responsible renewable power generation, the observed improvements would not have materialised. GET FiT envisions that the projects will also continue to benefit through a robust social licence to operate and be compliant with national requirements and permit conditions.

4.2 Key Improvements

Looking back at the GET FiT Programme, substantial improvements in terms of environmental and social risk management include:

- Greater in-house environmental and social awareness among the project developers across all levels and increased environmental and social capacity, both in the home office and at the project level.
- Improved environmental and social management systems, plans and procedures, including increased understanding of risks and required management responses specific to hydropower and biomass cogeneration.
- Greater exploration of alternative project designs and construction methods to better incorporate environmental and social risks, even if, at times, unfortunately late in project planning and even during construction.
- Improved supervision and monitoring of contractors' E&S practices by project developers.
- Improved working conditions, including reduced risks to workers' health and safety as well as access to functional workers' grievance mechanisms.

- Reduced risks to community's health and safety as well as access to functional community grievance mechanisms.

- More robust compensation processes for people losing land, houses, crops, or access to natural resources, including more fair compensation, particularly by ensuring full replacement value for losses.

- Reduced pollution of rivers during construction and less damage to biodiversity, including support to Uganda Wildlife Authority in the form of two new ranger posts to better protect national park areas neighbouring project sites.

- Improved release and monitoring of environmental minimum flows through more reliable and verifiable arrangements, including retrofitting new arrangements during project operations to replace unreliable or mismanaged solutions.

- More appropriate management of fish migration with the removal of planned fish passages that lacked sound ecological justification as well as improved arrangements of fish upstream and downstream fish passage where such are required.

Further opportunities and benefits have also materialised, particularly related to the thousands of jobs for local people created during construction and the associated skills strengthening for potential future employment. The number of jobs for the longer-term operations phase is much smaller except at the biomass cogeneration plant but nevertheless important for those benefitting.

The supply of safe drinking water is a key element of productive and healthy lives. Several projects have implemented local water supply schemes for project-affected people and surrounding communities, partly as mitigation for reduced access to river water due to the hydropower projects and partly as Corporate Social Responsibility (CSR) activities beyond mitigation requirements. Improved quality and reliability of drinking water can be a substantial positive community impact from the GET FiT projects.

In 2021, GET FiT and ERA convened an Environmental Flows Working Group in Uganda with key stakeholders such as the Directorate of Water Resources Management (DWRM), the National Environment Management Authority (NEMA), the Uganda Electricity Transmission Company Limited (UETCL), the Uganda Electricity Generation Company Limited (UEGCL), and the Ministry of Energy and Minerals Development (MEMD). The Working Group reviews the, at times, non-compliant practices on minimum flows as well as recommends requirements and guidelines for hydropower developers in Uganda to implement robust environmental flow arrangements that safeguard the economic interest of the off-taker and consumers as well as ecosystems and local water users. There has been much interest in the Group's work among the key stakeholders, and work continues in 2022.

05 Financial Status

5.1 Funding Commitments

GET FiT Uganda is dependent on predictable commitments from sponsors in order to be successful since it is a results-based programme – meaning that subsidies are being paid following the actual delivery of energy. Several changes were made to the portfolio structure since the Programme's inception in 2013, demanding an active follow-up 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 proactive manner. Four development partners have taken up the challenge and provided GET FiT with the necessary funding: The Government of Norway, the Government of the UK (through Department for Business, Energy & Industrial Strategy (BEIS) and FCDO – formerly DFID), Germany (BMZ) and the EU (through European Union Infrastructure Trust Fund (EU ITF)). About EUR 93.5 million has been committed to the Programme, and an overview of the respective commitments can be found in the table on the right.

Table 2 | Overall Donor Commitments to GET FiT

Donor	Net Amount Committed (EUR)
Norway	15,592,885
UK BEIS	28,728,667
UK FCDO (formerly UK DFID)	14,129,894
GER BMZ	15,000,000
EU ITF	20,000,000
Total	**93,451,446**

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

The exchange rate developments in 2021 had a positive impact on the overall budget of GET FiT Uganda due to some undisbursed donor commitments in GBP – increasing the total net commitments by circa EUR 700,000 compared to last year. Only a limited amount of undisbursed donor contributions remains at this stage, with approximately 8 % of the total GET FiT budget in the form of 6.5 million GBP subject to foreign exchange rate risk. GET FiT frequently monitors exchange rate developments to allow for proactive action if needed. Moreover, a budget buffer was introduced in previous years to cushion future increases in the EUR/GBP rate until the remaining disbursements are made to KfW and converted into EUR. Reference is made to previous **GET FiT annual reports**.

5.2 Disbursement Forecast

GET FiT funds are disbursed for the following three purposes:

- Project grants, where 50 % is paid at the 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.

The actual and projected disbursements from the Programme are illustrated in **Figure 25**. The overview includes net funding available to the Programme only. The projections are based on the status of the project portfolio and expected disbursements. During the first five years of operation of each project, results-based disbursements in the form of annual subsidies are made.

Notably, project construction delays have influenced the disbursement profile, delaying the payment of COD premiums and annual subsidies. Following the commissioning of the remaining three plants – the Nyamagasani 1, Nyamagasani 2, and Kikagati SHPs – there is limited risk for major delays in the disbursement. The COD disbursement amount is subject to some adjustment, as these three projects face monthly subsidy penalties for construction delays during 2020 and 2021, which were also impacted by Force Majeure events due to flooding events and the global COVID-19 pandemic.

The determination of penalties and COD subsidy amounts concluded in early 2022. Accounting for the construction duration overruns and the varying impacts of the flood events and COVID-19 pandemic, the Nyamagasani 1, Nyamagasani 2, and Kikagati SHPs were assessed to have effectively overrun the GET FiT COD deadline by 13 months, nine months, and seven months respectively. Accordingly, the COD subsidy due to these projects was reduced by the number of months multiplied by 5 % of the COD subsidy amount. COD subsidy amounts were therefore reduced for these projects by 65 %, 45 % and 35 % respectively.

There is some uncertainty tied to the annual result-based payments for all projects in the portfolio. Since the developers will only be paid for what they are producing (with a cap at their planned average

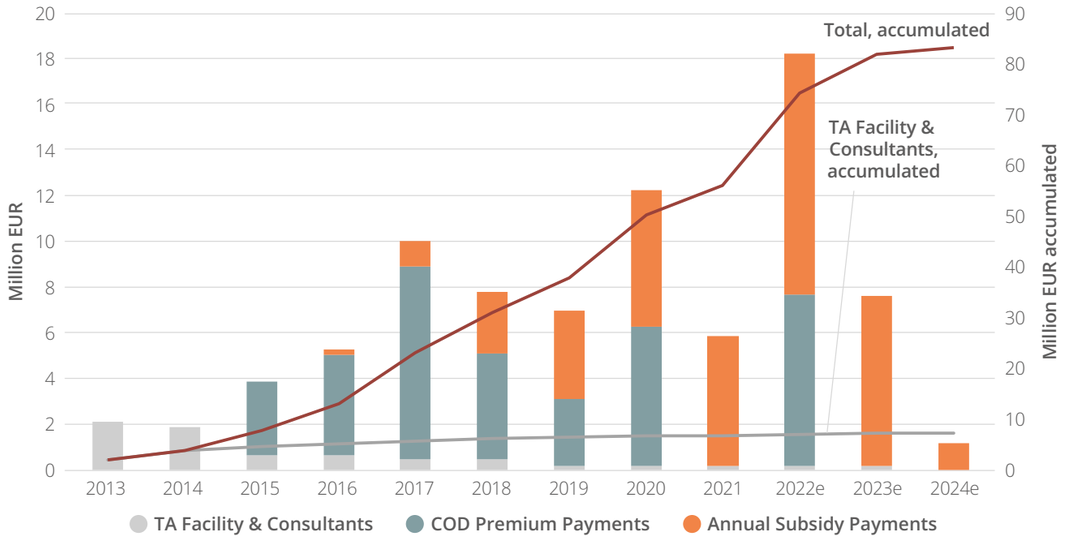


Figure 25 | Projected Annual Payments (Premium Payments and Consultants) under GET FiT

Note: Projections are subject to budget uncertainty. Subsidy penalties were considered in the disbursement projection.

energy generation), under-production may lead to an accumulation of excess funding. In addition, eligibility for the annual subsidy payments will end in 2023 for all projects (except for Kikagati, for which the eligibility will end in 2024, as the project has been granted an exception due to transboundary issues), signifying that there will not be any disbursement after 2024, resulting in additional available funds. It has been agreed with donors that excess funding may be allocated to the interconnection components that are supported by GET FiT.

Figure 26 shows the relative shares of the various cost components under the GET FiT Programme, based on current budget reservations. Overall, approximately 8 % of the overall funds are tied to management, implementation and the Technical Assistance Facility, while 92 % of the total commitments are allocated to premium payments.

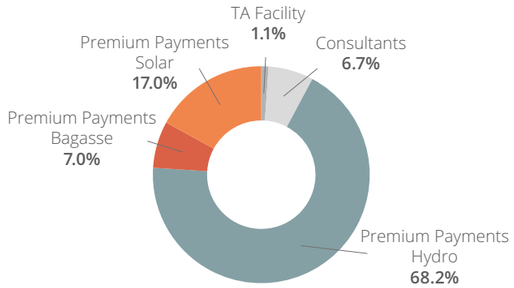


Figure 26 | Distribution of Budget Reservation of GET FiT Uganda

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 is structured in a logical framework (Logframe) outlining the relationship between targeted Outputs, Outcomes and Impacts and setting baselines, expected milestones and targets.

In 2021, the programme achieved major success by commissioning the last three projects throughout the year. Despite some delays in project implementation, intensive efforts in previous years have 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, are also affected by the overall reduced capacity of the portfolio.

Overall, energy generation increased by approximately ten percent year-on-year as the increase in capacity was partly offset by frequent and long grid outages. Notwithstanding, the project is already reaching, and even exceeding, some 2023 targets, such as job creation and sector-related indicators. We expect improved grid connection for some operational projects and that all projects fully recover from 2020's flood, so that continued improvement in delivered results in the coming years is likely.

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.

Table 3 | 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 three remaining projects were commissioned in 2021, meaning that the full planned capacity is now installed. As the three projects reached COD towards the end of the year, their electricity supply contribution was still limited. Nevertheless, overall electricity generation increased, marking a ten percent increase year-on-year. The overall generation of 418 GWh in 2021 represents approximately 55 % of the 2023 target and 54 % of the target adjusted to the final portfolio size. Grid outages, unfortunately, harmed the electricity generation in 2021 and led to high deemed energy figures of 15 % of the total potential produced electricity, down from 25 % in 2020. However, as the project portfolio runs at full capacity now, we again expect rising delivered electricity figures in 2022.

The GET FiT portfolio is contributing to the country's geographical and technological diversification, being represented in most regions of the country and multiple renewable energy technologies. In addition, it is diversifying the group of developers, contractors and other players that participate in the Ugandan electricity sector; almost 50 % of the grid-connected generating power plants in the country (17 out of 36) are supported by GET FiT.

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 13,000 created jobs (FTEs – Full-Time Equivalents), exceeding the initial target by far. In 2021, the portfolio contributed another 1,200 FTE jobs, compared to last year's 1,400. The reason for the decline in FTE workers per year is that Nyamagasani 1 and 2 were commissioned during the year, which reduced their need for construction works during 2021. Therefore, as all projects are now operational, it is expected to see a drastic reduction in FTEs per year from 2022. Notably, the share of Ugandan employment in 2021 remains at about 86 % (90 % of cumulative FTEs over the Programme duration).

In addition, indicators relating to the Technical Assistance activities at the regulator ERA provide positive signals. ERA achieved being ranked number 1 in the Africa Electricity Regulatory Index for four consecutive years in 2021. However, the implementation of the RIMS component experienced further delays, and therefore the licensee reporting has not been digitalised yet. A roll-out of the platform is expected for early 2022.

Also, more than USD 455 million in investments have been raised for the GET FiT portfolio – thereof approximately USD 165 million are represented by private and USD 290 million by public funding. Consequently, private financing represents a share of 36 %.

With an increasing level of energy generation, the Programme portfolio is contributing to reducing Uganda's GHG emissions. The thermal generation has reduced significantly over the last years from 100 GWh in 2019 to 57 GWh in 2020 – to finally 51 GWh in 2021.

An overview of all Output indicators is presented in **Table 4**.

Table 4 | Output Indicators

Indicator	Target 2023	Status 2021	Target Achieved	Comment
Output 1 – Increased small scale renewable energy capacity and generation				
Indicator 1.1 MW installed	170 (158.4)	**158.4**	93 %	The last three projects were commissioned in 2021, totalling an installed 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 cogeneration projects than originally expected.
Indicator 1.2 GWh/year delivered to the national grid	830 (760)	**418**	55 %	Annual production has increased by 10 %, from 380 GWh, since 2020. The Portfolio has an expected annual generation of 762 GWh, given production throughout the entire year (three projects commissioned late in 2021). Deemed Energy in 2021 was about 69 GWh, which is not considered in the reported value. Generation data is presented as provided by the developers.
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 four 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	**1.17**	29 %	The cumulative net change in 2020 was at 0.90 and increased by approximately 270,000 tonnes during 2021. 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	**12,993**	309 %	GET FiT is exceeding targets on this indicator. More than 850 full-time equivalents (FTE) jobs were created in 2021.
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	**5.3**	5.3	Based on data for 3 generation licenses which were issued in 2021. Compared to previous years (and especially 0.8 months in 2020), 2021 was a setback for ERA in terms of generation license processing time. ERA was heavily impacted by the COVID-19 situation in 2021, particularly the 42 days of lockdown that the country faced in June/July. It is expected that this will improve again in 2022.
Indicator 5.2 Number of REFiT tariff reviews taking place by ERA per year	1	**1**	100 %	The tariffs were reviewed in 2021, and the only update was to the solar PV cap.
Indicator 5.3 Timely and complete reporting to ERA by licensees	100 %	**95 %**	95 %	This indicator slightly keeps on improving each year and increased from 91 % in 2019 and 93 % in 2020 up to 95 % in 2021.
Indicator 5.4 Online delivery of ERA services	50 %	**0 %**	0 %	The Regulatory Information Management System (RIMS) is expected to be rolled out in 2022.
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 %	Mobilised finance at financial close. 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 the improved financial stability of the energy sector. A third indicator on local grid stability has been excluded from the Logframe in 2018.

Four commercial banks were providing financing to GET FiT portfolio at Financial Close, and as further projects restructure debt in the future, it is expected that more commercial banks will become involved in the Ugandan energy sector. While the power utility UETCL paid all its invoices for delivered energy in 2021, some developers have reported on delayed deemed energy payments. 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 number of permits and licenses issued by ERA per year has slightly increased from last year but is still not back at its target of 12 permits and approvals per year, as obtained in 2019. The targeted amount of energy bought from thermal stations by UETCL has, on the other hand, been well below its target of 832 GWh in 2023 for years and also slightly decreased from 57 GWh in 2020 to 51 GWh in 2021. The retail tariffs continue to be 97 % cost-reflective, which is slightly less than the target of 100 % cost-reflectiveness.

An overview of the Outcome indicators is provided in **Table 5**.

Table 5 | Outcome Indicators

Indicator	Target 2023	Status 2021	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 %	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 for small-scale projects (1-20 MW) by ERA per year	12	**9**	75 %	Four permits and five generation licences, whereof 6 were for hydropower plants, 2 for cogeneration plants and 1 for a solar plant.
Indicator 1.3 Occurrence of annual "UETCL event of default" for energy supplied (deemed energy)	0	**0**	n/a	Seven projects have reported delayed deemed energy payments. 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 only once a year.
Indicator 1.5 REFiT adjusted to be cost-reflective	100 %	**100 %**	100 %	The REFiTs have ceiling tariffs and 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**	n/a	All energy purchased beyond standby capacity was covered by tariffs.
Indicator 2.2 GWh purchased by UETCL from thermal stations	832	**51**	n/a	The sector is well below target due to i) lower demand for thermal power than anticipated and ii) thermal energy being offset by renewable energy.
Indicator 2.3 Cost-reflective retail tariffs	100 %	**97 %**	97 %	Capacity payments remain part of the subsidy paid by the Government.

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". The impact of the Programme is measured through three indicators, which are presented 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.

The target related to grid-related CO_2 emissions per kWh electricity used in Uganda was achieved years ago, and the emissions only keep on reducing each year. From 2020 to 2021, the CO_2 emissions reduced by 20 %.

The relevant metrics for indicators 2 and 3 have not been updated during 2020 and 2021 due to the global COVID-19 pandemic, and as such, the actual situation on the ground may have developed further. Hence, the figures provided below reflect the status as of 2019. The overview of the Impact indicator developments in 2021 can be found in **Table 6**.

Table 6 | Impact Indicators

Impact Indicators	Target 2023	Status 2021	Comment
Indicator 1 Grid related CO_2 emissions per unit electricity use[12]	0.09	**0.01**	Grid related CO_2 emissions decreased by 20 % from 2020 to 2021, from 0.010 to 0.008.
Indicator 2 Percent of population with access to electricity	26.4 %	**28 %**	No official electrification rate statistics have been reported since the 2019 joint sector review. However, UBOS has reported an electrification rate of 19 % for households in 2020/2021, but based on a different methodology.
Indicator 3 Electricity consumption (kWh per capita)	105	**103**	Following the 2019 joint sector review, no new official electricity consumption statistics were reported.

6.2 Risk Management

Continued risk monitoring is important in complex programmes such as GET FiT Uganda to mitigate the risks that are possible to interfere with and to be prepared when the context changes. If possible, one should also decrease the impact it will have on the programme if an unwanted situation arises.

Since last year, the risks of the programme have changed substantially with the commissioning of the three last hydropower plants in 2021. Unfortunately, the risk of projects reaching deemed commissioning has materialised for those projects. Accordingly, continued operations at reduced capacity due to unresolved constraints of the high and medium voltage national grid is a major concern. This risk is closely monitored by GET FiT, which aims to mitigate adverse effects through fast-tracking the implementation of grid infrastructure projects. Further, the risk of corruption and misuse of funds has reduced with the commissioning of the three projects.

Further to the changes above, two risks were removed from the risk matrix in 2021 due to the commissioning of the remaining projects: The risk of additional construction delays and health risks onsite due to COVID-19 restrictions for Nyamagasani 1, Nyamagasani 2 and Kikagati, as well as the insufficient understanding of ground conditions, resulting in changes in the design and layout of projects and/or adverse environmental and social impacts as a result of landslides or similar during construction.

An overview of the most relevant remaining risks across the Programme is presented in **Table 7**.

Table 7 | Risk Matrix

Description of Risk	Mitigation Actions	Progress	Risk Assessment
Operational GET FiT plants generating power at reduced capacity due to continuing, unresolved constraints of the high and medium voltage national grid.	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, particularly related to compensation of Project Affected Persons (PAP) remain at the end of 2021. High risk of continued high deemed energy generation from the GET FiT portfolio, particularly from the three projects commissioned during the year.	high
Availability of wayleave compensation funds related to new power lines for grid connection of GET FiT projects.	Through high-level engagement with the relevant GoU agencies, GET FiT has stressed that timely provision of compensation funds is a critical prerequisite to completing the ongoing GET FiT grid connection projects and safeguard the overarching targets of the Programme.	GoU has committed to providing the necessary compensation funds, and a share of the required funds is secured in an escrow account. Nevertheless, a risk of cancellation of remaining compensation on the basis of political prioritisation remains.	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.	The general risk of curroption, misuse of funds and bribes paid by contractors is considerably lowe with all projects having commissioned. The risk of corruption, misuse of funds and bribes paid by developers is also lower when all projects are operational, but the erisk is still there as annual production amounts does impact the subsidy paid out by GET FiT.	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 underperforming projects. A water and energy sector working group was established in 2021, addressing the issue of minimum/environmental flow compliance for hydropower 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 via post commissioning visits. The risk of non-compliance and associated reputational risks remain. A minimum flow working group was kicked off in 2021, financed and coordinated by GET FiT, in close cooperation with the relevant GoU authorities. Work with the group will continue in 2022.	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) and positive exchange rate development during 2021 for disbursement commitments in GBP. A funding shortfall under the grid connection component remains, which will be covered via available funds under the original Programme budget.	low

07 Other GET FiT Initiatives

7.1 GET FiT Zambia

The second roll-out of the GET FiT concept – GET FiT Zambia – was launched in 2018 in Lusaka and is now in its fourth year of implementation. Similarly to Uganda, the objective of the Programme is to improve the framework conditions for private investments in small-scale renewable energy in the country. The principal 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 Ministry of Energy and KfW and is 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.

In addition to the procurement of up to 200 MW of renewable energy capacity at the core of the Programme, GET FiT Zambia comprises a set of tools that address barriers and gaps in the Zambian energy sector (see illustration below).

Procurement & Transactions	Debt & Risk Mitigation Facility	Viability Gap Funding	Grid Facility	Technical Assistance
- Competitive procurement of 100 MW of Solar Capacity - Competitive procurement of up to 100 MW of Hydro	- Mitigating short & medium-term liquidity risk Regional Liquidity Support Facility (RLSF)	- Production-based top up for Hydro Projects - Competitive bidding top-up, based on Usc/kWh for the entire PPA	- Shallow and deep integration support (funding and TA) - Grid-related technical assistance	- Skill Gap identification at key sector stakeholders related to IPPs - Procurement of tailored capacity building and TA programmes
Lack of credibility amongst investors that procurement efforts will result in execution	Individual small projects unable to attract appropriate financing and associated DD	High cost of capital for renewable transition and new REFiTs yet untested	Capacity constraints for integration and operation of decentralized intermittent RE, and rural electrification opportunities being overlooked	Skills gaps and capacity constraints in becoming credible counterpart to investors

Figure 27 | GET FiT Zambia Toolbox

The procurement, through a reverse auction, of 120 MWac in the form of six solar PV projects in early 2019 was considered as successful. It achieved record-breaking bids for Sub-Saharan Africa, down to 3.999 USc/kWh (and a weighted average of the successful projects at 4.41 USc/kWh).

In 2021, the GET FiT Zambia Secretariat continued to work to ensure progress on the six awarded solar projects after the delay that had ensued following the challenges 2020 had presented. The Small Hydro Programme was also affected by said challenges that the Government of Zambia, through the GET FiT Zambia Secretariat informed the pre-qualified developers that it is not deemed prudent to launch the Request for Proposal (RfP) phase for this tender until the main challenges have been addressed.

GET FiT Zambia continues to aim for impacting the energy sector at large, through improving the framework conditions for private investments in renewable energy in line with the programme's objectives. By demonstrating successful completion and implementation of renewable energy projects, the hope is that GET FiT Zambia will pave the way for increased private sector engagement in the sector in the future.

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.

7.2 GET FiT Mozambique

Mozambique is generously endowed with renewable energy resources – with about 18 GW in hydropower potential and favourable conditions for electricity production from solar, wind and biomass. However, the country is still suffering from electricity access rates of 40 %. The utility Electricidade de Moçambique (EDM) operates about 0.5 GW of generation capacity, and a number of large energy development projects are in process. The government and EDM recognise the need to work with the private sector and alleviate challenges related to under-capacity of energy infrastructure and weak security of supply to facilitate the investments that are required for Mozambique to achieve its ambitions of ensuring access to affordable and sustainable energy to its population and at the same time build its position as a powerhouse in the Southern African Region. The third roll-out of the GET FiT concept in Mozambique aims at improving the framework conditions for private investments in renewable energy – in support of a climate-friendly development, lower greenhouse gas emissions and poverty reduction.

The Programme is implemented over an initial four-year period and is expected to launch in 2022. At the core of the Programme is the procurement of generation capacity by IPPs, with the first round targeting a reverse auction of up to 30 MW of solar PV with storage.

As in Zambia and Uganda, the Programme's toolbox includes several instruments to support the development of the energy sector in Mozambique:

- **Viability Gap Funding** – Supplementation of the feed-in tariffs to a cost-covering level
- **Grid Integration Facility** – Financing of grid connection costs for subsidised power generation plants from private developers (IPPs)
- **Risk Mitigation Facility** – Risk Coverage Guarantee Facility for IPPs
- **Capacity Development Facility** – Capacity building at the partner institutions through technical support and supervision of the IPPs.

The Government of Mozambique and KfW signed the Financial Agreement for the Programme in 2019. The German Government has provided a EUR 25 million grant for its implementation. The Ministério dos Recursos Minerais e Energia (MIREME) is the Programme Implementing Unit.

In 2021, MIREME procured the Implementation Consultant, paving the way for the launch of GET FiT Mozambique in mid-2022.

For further information about the Programme, please visit the website **www.getfit-moz.org**.

08 Looking Back & Ahead

After the great achievement of commissioning the last projects in 2021, now is an appropriate time to take a step back and look at the Programme's developments since its inception and first Request for Proposal (RfP) in 2013.

Looking Back

The first full year after the launch of the Programme, 2014, marked a productive year. Besides completing a second RfP round for hydropower, biomass and bagasse projects, the first on-grid solar PV tender in Uganda was successfully completed. This early progress was further built upon when the first four projects signed a PPA with UETCL in early 2015. However, it was also recognised early on that grid integration for several projects in the GET FiT portfolio would be a major challenge and the most critical external risk to GET FiT supported projects contributing power to the Ugandan grid.

During 2015, the positive Programme developments continued, and besides a successful third RfP round, the first and only biomass (bagasse) project was commissioned in July 2015, which resulted in the first premium payment disbursed by the Programme. In 2016, the solar PV project Soroti followed quickly and was commissioned as Uganda's first on-grid solar power plant in November. Further, it was announced that critical grid infrastructure for power evacuation of GET FiT projects would be constructed with the assistance of GET FiT development partners, funded by FCDO, to improve grid integration.

In 2017, the hydropower projects started contributing to the portfolio generated electricity, with three of the hydropower projects commissioned during the year. Furthermore, technical assistance offered by the GET FiT TA facility towards ERA bore fruit, with ERA implementing a new grid connection code and framework for regulating the wheeling of power (transmission through a third-party network). An improved framework for compliance monitoring of transmission and distribution licensees was also established, and a GET FiT knowledge transfer activity was launched with ERA that aimed to institutionalise experience and competence gained throughout the implementation of the GET FiT portfolio. Continuous development of improvement at the regulator did not go unnoticed: The African Development Bank ranked Uganda as number one in the Electricity Regulatory Index for Africa in 2018 – and continued to do so for the following three years up to today. Furthermore, the Programme surpassed the threshold of 10,000 jobs (measured as full-time equivalent) created in 2019.

By the end of 2019, 14 of the 17 GET FiT supported projects were generating and evacuating power to the grid, with only three small hydropower projects remaining to complete construction works and commission. With these promising developments and figures, one might already have looked towards the home stretch when entering 2020. However, in 2020 the COVID-19 pandemic emerged, which impacted the progress of the Programme portfolio still

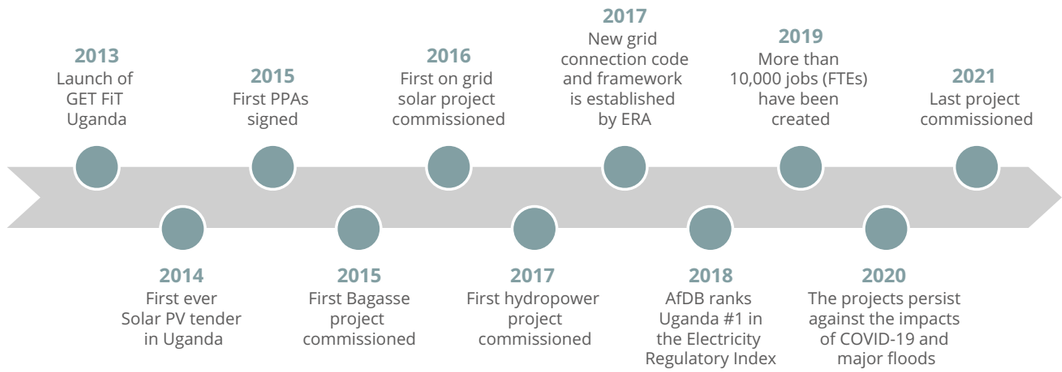


Figure 28 | GET FiT Uganda milestones

under construction. This was further exacerbated by major floods that occurred in Western Uganda. Despite the challenging circumstances and setbacks, the remaining projects commissioned and were evacuating power to the grid by the end of 2021. This represented a major milestone for the Programme, with the full portfolio of 158 MW installed capacity successfully implemented.

As of the end of 2021, the grid infrastructure was also improving, with deemed energy from the portfolio reducing from 25 % of the potential generated energy in 2020 down to 15 % in 2021 – as some important grid works were completed, such as the reinforcement of the Opuyo substation. Despite the challenges encountered, the GET FiT Uganda Programme has ended up implementing a portfolio of 17 renewable energy projects, which are all operational and producing valuable renewable energy for the Ugandan power system.

Lessons Learned During Implementation

Now that the GET FiT Uganda Programme is nearing an end, it is now important to take stock of the achievements and challenges and to draw lessons learned. For example, on the environmental and social risk management side, through the monitoring of the design, tendering, construction, and commissioning of projects, many lessons can be drawn regarded elements which require particular consideration in future programmes. Some areas stand out as particularly important, to avoid some of the costly mistakes observed. For example, much can be gained from improved prioritisation of limited early-stage resources for project developers. Improved prioritisation and focus also require better integration of environmental and social aspects with engineering and other disciplines. Poor site selection, insufficient layout optioneering and inadequate understanding of basic site parameters such as topography/terrain, land requirements and key water use interests have proved to be particularly critical in some hydropower projects. Increased land take, community conflicts, construction delays, design changes, and changes to the environmental minimum flow and fish passage arrangements have resulted in costs that could have been avoided by more strategic early-stage project development.

The substantial size of the GET FiT project portfolio, combined with the considerable duration of GET FiT Programme follow-up, means that there is an unusually wide basis for learning across all stages of the project life-cycle, also in disciplines other than environmental and social risk management. The Programme represents a gold mine of knowledge that can be further mined for lessons, including tracking important aspects of the operations and maintenance phase of the 17 projects. It is the Programme's intention to publish these lessons to a wider audience before the Programme ends, both so that the Ugandan government can consider those aspects when further developing the relevant framework, and for other similar future IPP Programmes to consider. As part of this important work, an Environmental Flow Working Group, has been established as a forum for key Ugandan Government stakeholders to share information and lessons and to engender a harmonised approach to this important topic, even after the conclusion of the Programme.

Looking Ahead

The efforts of the last year have demonstrated the successful implementation of a public-private partnership support programme. Some important work remains ahead in the coming years as the Programme comes to an end, including continued follow-up of the projects, particularly related to environmental and social performance. Further, deemed energy remains a significant challenge. Therefore, robust and reliable grid integration remains as a focus area for GET FiT in 2022, to assist the Government of Uganda with addressing these issues through funding and implementation of new evacuation lines in Western Uganda. In addition, GET FiT remains committed to delivering technical assistance services to ERA, through continued engagement in the Environmental Flow Working Group, as well as the finalisation of the RIMS by the end of 2022.

All in all, we can report with confidence that GET FiT will – and to a great extent already has – achieved its overarching goals, and we look ahead optimistically towards the final implementation years of the Programme.

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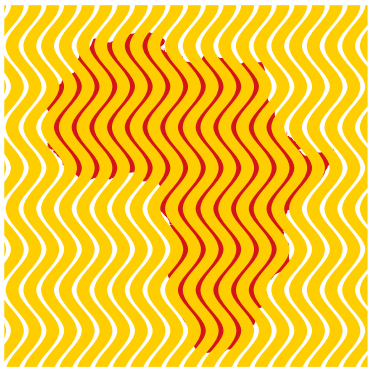

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