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ZAMBIA COUNTRY REPORT

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Frequently used acronyms and abbreviations

COD	Commercial operation date
CCGT	Closed Cycle Gas Turbine
DA	Direct agreement
DFI	Development finance institution
DfID	Department for International Development (UK)
DN	Directly Negotiated
ECB	Electricity Control Board
EOI	Expression of interest
EPC	Engineering, procurement and construction
IA	Implementation agreement
ICB	Internationally Competitive Bid
IFC	International Finance Corporation
IPP	Independent power producer
MME	Ministry of Mines and Energy
NIRP	National Integrated Resource Plan
O&M	Operations and maintenance
PPA	Power purchase agreement
PRG	Partial risk guarantee
PV	Photovoltaic
RED	Regional Electricity Distributor
REFiT	Renewable energy feed-in tariff
RfP	Request for proposal
ROE	Return on investment
SAPP	Southern African Power Pool
SHA TS	Shareholders agreement term sheet
TCA	Transmission connection agreement
UK	United Kingdom

1 Introduction

In the past four years, Zambian solar photovoltaic (PV) auction prices have broken African records twice. This achievement is despite an economic slowdown and investors facing an unbankable off-taker in the state-owned vertically integrated utility ZESCO. When the first auction results were announced in 2016, they were quickly dismissed by some as perhaps merely a fluke brought about by exceptional circumstances. Then the second set of record-breaking results in 2019 put this assertion to bed. The 2019 results were achieved at a time when the fortunes of the Zambian economy and ZESCO, in particular, had declined even further. It is worth asking how these expectation-defying results have been achieved? Is it the fact that both auction processes have been initiated and driven by external development finance institutions that the market knows and trusts? Is it the suite of security arrangements meant to protect project revenues and investments that have been provided as part of the auctions? Are there perhaps other, less obvious factors that played a defining role? And are these circumstances unique to Zambia, or is there scope for them to be replicated across the wider region?

Zambia's Industrial Development Corporation (IDC), a state-owned development finance institution and holding company for state-owned enterprises, engaged the International Finance Corporation (IFC) to implement the first Scaling Solar auction in Zambia in 2015. Scaling Solar aimed to rapidly develop privately owned solar PV projects in sub-Saharan Africa using a range of World Bank resources and services in a holistic package that could also be replicated in other countries. This included advisory services, standardised contracts, and a stapled offer of concessional financing, guarantees and insurance. The Scaling Solar approach emphasised the derisking and reputational benefits of a programme backed by the World Bank Group, but left the actual implementation to the host country institutions.

A pre-qualification round in October 2015 for two 50 MW solar PV plants attracted submissions from 48 interested potential bidders. The Request for Proposal (RfP) was provided to 11 pre-qualified bidders in February 2016, seven of which decided to submit a bid. Two winning bidders were announced in June 2016: Neoen/First Solar, with 52 MW¹ at US\$6,02/KWh, and ENEL Green Power with 34 MW² at US\$7,84/KWh. The prices achieved were significantly lower than expected, and are still some of the lowest for solar PV projects globally at the time³ (Industrial Development Corporation, 2016; World Bank Group, 2016). While the originally envisaged timelines for project realisation failed to materialise, both projects eventually managed to reach commercial operation in the first quarter of 2019.

The second solar auction, was based on the GET FiT approach pioneered in Uganda as a support programme to renewable energy feed-in tariffs (REFiTs) for small hydro and biomass projects. It was implemented from 2013 by banking group KfW and funded by a host of European development partners, including the European Commission. Like Scaling Solar it provided advisory services, standardised contracts and payment guarantees. It also provided top-up premium payments to awarded projects, but no stapled financing. KfW furthermore established an elaborate programme management and governance structure, including a steering committee, investment committee and full-time secretariat hosted by the Electricity Regulatory Authority (ERA) of Uganda. It delivered 17 renewable energy projects, including two competitively procured 10 MW solar PV projects at around US\$16,37/MWh Uganda

¹ This is a DC number. The actual AC number is 47 MW.

² This is a DC number. The actual AC number is 28,2 MW.

³ Based on an internal estimate by the IFC, the price may equate to around US\$47/MWh assuming that bidders had been bidding on an indexed basis similar to the SA REIPPPP.

Electricity Transmission Company Limited (UETCL) only pays US\$ 11/kWh, with the remaining US\$ 5,37 covered by a top-up premium payment from the European Union).

GET FiT became the official implementation programme for the Zambian REFiT strategy in Dec 2017. Phase 1 of the strategy targeted the procurement of 200 MW of hydro, biomass and solar PV based projects, with a maximum size of 20 MW per project. The programme management setup was similar to that used in Uganda, with the exception that the Zambian secretariat was hosted by the Ministry of Energy. The programme started with a 100 MW⁴ solar PV auction (with an individual project cap of 20 MW) in 2018/19 that made no provision for top-up payments, but otherwise closely followed the design of the Ugandan programme. This included the provision of a sovereign guarantee and a dedicated liquidity support facility. Ten firms were prequalified, eight of which eventually submitted bids. The results were even more dramatic than Scaling Solar's, with three winning bidders, each with two projects of 20 MW, announced in April 2019: Building Energy & Pele Energy at US\$ 3,99/kWh (the first solar PV project in Sub-Saharan Africa below US\$ 4/kWh); Globeleq & Aurora Power Solutions at US\$ 4,52/kWh; and Innovent and CEC at US\$ 4,80/kWh.

The level of competition in an auction is a key determinant of price outcomes: the more competitive the auction, the more bidders will tend to reduce their bid prices in order to increase their chances of winning. The level of competition refers not only to the number of bidders, but also the type of bidders participating (Ballesteros-Pérez et al., 2016). Stronger bidders are more likely to bid more aggressively. Potential bidders' decisions to bid depend on two factors: the perceived risks of bidding, and the risks of the project(s) (Zitron, 2006). Project risks are often mitigated through providing bidders with a security package, including sovereign guarantees, political risk cover and liquidity support (Woodhouse, 2005b; Gratwick and Eberhard, 2008; Eberhard and K. N. Gratwick, 2013; Eberhard et al., 2016). Robust project risk mitigation has been shown to significantly impact project prices through lowering a project's weighted average cost of capital (WACC) (Ondraczek, Komendantova and Patt, 2015; Schinko and Komendantova, 2016; Angelopoulos et al., 2017). The perceived risks of bidding are affected by a bidder's calculation of bidding costs and perceptions of their probability of winning – an area covered extensively by auction theory (Klemperer, 2001; Ausubel and Milgrom, 2013; Hubbard and Paarsch, 2016; Haufe and Ehrhart, 2018) – but also by the bidder's trust in the procuring entity and bidding process (Colquitt, 2001; Zitron, 2006; Chiu, Huang and Yen, 2010).

Both programmes attracted significant interest during prequalification and bidding rounds, importantly from some of the biggest international developers in the sector, through effectively de-risking the projects. Scaling Solar provided bidders with a government support agreement that would see the Zambian state buy the asset at a predetermined price in case of ZESCO default; letters of credit from ZESCO; and partial risk guarantees from the World Bank to cover project loans and off-taker payments (optional). IFC also provided bidders with two tranches of highly concessionary debt (bidders had to secure a third tranche) and the Zambian state provided the sites and grid connection infrastructure. GET FiT provided bidders with a similar sovereign guarantee covering project termination, as well as optional payment guarantees (liquidity support) from a KfW funded Regional Liquidity Support Facility (RLSF) provided by Africa Trade Insurance (ATI). GET FiT did not provide projects with any stapled concessionary financing, although it did facilitate access to an AfDB loan facility.

⁴ This was increased to 120 MW post-submission based on the dramatic price results.

Both programmes also came with significant reputational advantages. The Scaling Solar programme had the full backing of the World Bank Group which provided bidders with the assurance that the process could be trusted and the procurer would fulfil their obligations and stick to the rules. Similarly, the GET FiT programme not only had strong institutional partners behind it (including KfW, DFID, DECC (now BEIS), the European Union), but had also proven its commitment to transparency and ability to deliver results in Uganda. The significant presence of development finance institutions like the World Bank and KfW also came with a “halo” effect that mitigated investor fears around expropriation and payment defaults. Given the relationships with multi-lateral and bi-lateral finance institutions, the potential implications for government’s continued access to finance would disincentivise defaults and many steps could be taken prior to contracts unravelling (Woodhouse, 2005b; Gratwick and Eberhard, 2008; Marcel and House, 2016).

It would be simple to conclude that these remarkable auction prices are merely the result of effectively derisked projects implemented by international institutions trusted by the market. While this might be partly true, this explanation is not sufficient. The need is to understand the full array of choices that were made around the design and implementation of these solar auctions in Zambia, while simultaneously drawing out the key lessons for the region. The following sections provide a brief introduction to the Zambian power sector before diving into the details of both these programmes.

2 Zambia's power sector

The Zambian electricity sector is governed by the National Energy Policy of 1994 (currently being updated) and the Electricity Act of 1995 that formally⁵ established sub-Saharan Africa's oldest regulator – the Energy Regulation Board (ERB) – and permitted the introduction of the private sector and competition. While this period saw some improvement in ZESCO's operational performance it is notable that the ERB failed to increase electricity tariffs to cost-reflective levels which led to a lack of investment by ZESCO and the private sector (Kapika and Eberhard, 2013; Batidzirai, Moyo and Kapembwa, 2018). This underinvestment was further exacerbated by limited policy guidance on the allocation of new build generation opportunities between the private sector and ZESCO, with recent large Independent Power Producer (IPP) investment decisions based on unsolicited bids from Chinese and Indian developers (Kapika and Eberhard, 2013) (Table 1).

Table 1: List of power plants in Zambia

Power plants	Location	Technology	Installed capacity (MW)	Category	COD
Chishimba Falls Hydro	Luombe River	Hydro, small (<50 MW)	6	Utility	1971
Kariba North Bank Hydro	Zambezi River	Hydro, large	720	Utility	1977 (600), 2012 (720)
Kariba North Bank Hydro Extension	Zambezi River	Hydro, large	360	Utility	2014
Lunzua Hydro	Mbala district	Hydro, small (<50 MW)	14,8	Utility	1960 (0.75), 2015 (14.8)
Lusiwasi Hydro	Lusiwasi River	Hydro, small (<50 MW)	12	Utility	1967 (to be decommissioned soon)
Musonda Falls Hydro	Luongo River	Hydro, small (<50 MW)	10	Utility	(5), 2018 (10)
Upper Kafue Gorge Hydro	Kafue Gorge	Hydro, large	990	Utility	1972, 1978, 1989 (900), 1994 (990)
Victoria Falls Hydro	Livingstone	Hydro, large	108	Utility	1938 (8), 1969 (68) and 1972 (108)
CEC Riverside Solar PV	Kitwe	Solar, PV	1	Utility	2018
Bangweulu Solar Power Plant	Lusaka South Multi-Facility Economic Zone	Solar, PV	47,5	IPP (Scaling solar)	2019
Ngonye Solar Power Plant	Lusaka South Multi-Facility Economic Zone	Solar, PV	34	IPP (Scaling solar)	2019
Ndola Energy	Indeni Petroleum Refinery Ltd	Diesel	105	IPP	2013 (50), 2017 (105)

⁵ Despite the formal liberalisation of the sector, ZESCO remains the de facto monopoly state-owned utility in charge of almost all generation, transmission and distribution of electricity in the country.

TATA Itezhi-Tezhi HPP	Kafue River	Hydro, large	120	PPP	2016
Maamba mining-and-power project	Sinazongwe district	Coal	300	IPP	2016
Lunsemfwa Hydro	Lunsemfwa River	Hydro, large	24	IPP	1945 (12), 1961 (18), 2012 (24)
Mulungushi Hydro	Mulungushi River	Hydro, small (<50 MW)	32	IPP	1925 (2), 1927 (14), 1941 (20), 2009 (32)
Bulemu East Solar	Bulemu East	Solar, PV	20	IPP (GET FIT)	Awarded
Bulemu West Solar	Bulemu West	Solar, PV	20	IPP (GET FIT)	Awarded
Aurora Sola I	-	Solar, PV	20	IPP (GET FIT)	Awarded
Aurora Sola II	-	Solar, PV	20	IPP (GET FIT)	Awarded
Garneton North Solar	Garneton North	Solar, PV	20	IPP (GET FIT)	Awarded
Garneton South Solar	Garneton South	Solar, PV	20	IPP (GET FIT)	Awarded
Bancroft Diesel	Chililabombwe	OCGT	20	Embedded generation	1972
Konkola Deep Mining Project Diesel	Chililabombwe	ICE	24	Embedded generation	2012
Luano Diesel	Luano	OCGT	40	Embedded generation	1969
Luanshya Diesel	Luanshya	OCGT	10	Embedded generation	1978
Mufulira Diesel	Mufulira	OCGT	10	Embedded generation	1978

Source: Author's compilation

Institutionally, the Zambian power sector has two relatively unique features aimed at increasing private power investment (Table 2). The first is the Copperbelt Energy Corporation (CEC), a private, locally-owned company that supplies power to Zambia's biggest load centre, the Copperbelt mining region, by means of its own transmission system. While ZESCO has been struggling to improve its financial and technical performance, CEC has been operating efficiently and has recently also invested in IPPs. As such CEC is both an important standard-bearer for private participation in the country's power sector, and a potentially strategic local investor in and off-taker for private generation projects. The second unique feature is the Office for the Promotion of Private Power Investment (OPPPI), a specialised unit in the energy ministry tasked with increasing private investment in power generation and transmission. Despite the stated importance of increasing private participation in the power sector (World Bank, 2015; Batidzirai, Moyo and Kapembwa, 2018), OPPPI does not have a clear legal mandate to procure new power and is known to lack the capacity and resources needed to drive these processes (Kapika and Eberhard, 2013).

Table 2: Key institutions in Zambia's electricity sector

Ministry of Energy (MoE)	The Ministry of Energy was established in 2016, following a presidential directive to separate it from the defunct Ministry of Energy and Water Development (MEWD). The MoE is responsible for the formulation, development and implementation of the national energy policy, strategy and plan.
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Energy Regulation Board (ERB)	The Energy Regulatory Board was established under the Energy Regulation Act of 1995 Chapter 436 of the Laws of Zambia. The main role of the ERB is to ensure equity across all players in the electricity value chain, by ensuring that utilities are able to earn a reasonable return on investment, whilst prices are affordable for customers and quality of service is not compromised. The ERB issues licenses to prospective players, sets petrol and electricity prices, develops technical standards, and promotes new grid connections. It is also charged with fostering competition in the market and resolving conflicts amongst players.
ZESCO	ZESCO was established in 1970 as a state-owned (public) power utility company, responsible for power generation, transmission and distribution. ZESCO remains the largest electricity company in Zambia and is the single buyer of electricity from independent power producers (IPPs). Despite the formal liberalisation of the sector, ZESCO operates as a monopoly and is fully owned by the Industrial Development Corporation (IDC). Due to a highly subsidised tariff, ZESCO has been limited in its capability to maintain existing assets, reinforce and expand the national grid, and increase generation capacity.
Copperbelt Energy Company (CEC)	CEC owns and operates the transmission and distribution network in the Copperbelt area of the country, purchasing power from ZESCO and supplying it to the mines in the area. CEC also operates six gas turbines (80 MW installed) for emergency power.
Office for Promoting Private Power Investment (OPPPI)	The OPPPI was created in 1999 as part of the then Ministry of Mines, Energy and Water. It is responsible for fostering private sector participation in power projects in Zambia. The office is mandated to improve efficiency in the sector and ensure the use of sustainable and least-cost technologies by identifying projects, carrying out feasibility studies, developing and implementing competitive procurement programs, and managing co-ordination with other government agencies.
Rural Electrification Agency (REA)	The Rural Electrification Authority (REA) is a statutory body established by an Act of Parliament No. 20 of 2003. The main role of the REA is to improve rural electrification, using appropriate generation technologies. Functions include: management of the rural electrification fund; formulation, development and implementation of the Rural Electrification Master Plan (REMP); promotion of appropriate energy sources; encouragement of private sector players through competitive tenders; amongst others. The medium-term objective of the REA is to increase electricity access to 51% by 2030.
Zambia Development Agency	The Zambia Development Agency was created in 2006 by an Act of Parliament, and is responsible for boosting economic growth and development through the promotion of trade and investment. The agency serves as a platform for linking investors with information and services that eases market entry.
Industrial Development Corporation (IDC)	The Industrial Development Corporation (IDC) of Zambia was incorporated in 2014, pursuant to the Minister of Finance (Incorporation) Act Cap 349. It is a State-Owned Enterprise (SOE), that acts as an active investor and shareholder of state-owned enterprises (including ZESCO). The objective of the IDC is to position itself as the Government's prime special purpose vehicle (SPV) for facilitating investment and industrialisation. IDC plays a vital role in Zambia's electricity sector by facilitating the provision of long-term finance for electricity projects.

Zambia is in the top ten of sub-Saharan Africa's power systems, with more than 2850 MW installed capacity. Most of this capacity (2396 MW) is coming from hydropower, with two stations in particular generating most of the country's electricity: Upper Kafue Gorge hydro (990 MW) and the Kariba North Bank hydro (1080 MW) (Figure 1 and Table 1). This makes Zambia's power system and economy particularly vulnerable to drought. The Zambian economy is mainly built around copper mining, which requires reliable electricity supply to maintain production. In 2015 a severe drought caused daily blackouts of up to eight hours and mines – which consume 60% of the country's electricity – were asked to cut their electricity use by 30%. This plunged the Zambian economy into crisis, with GDP growth rates falling to below 3% from levels above 10% only five years previously, and the Zambian currency depreciating dramatically.

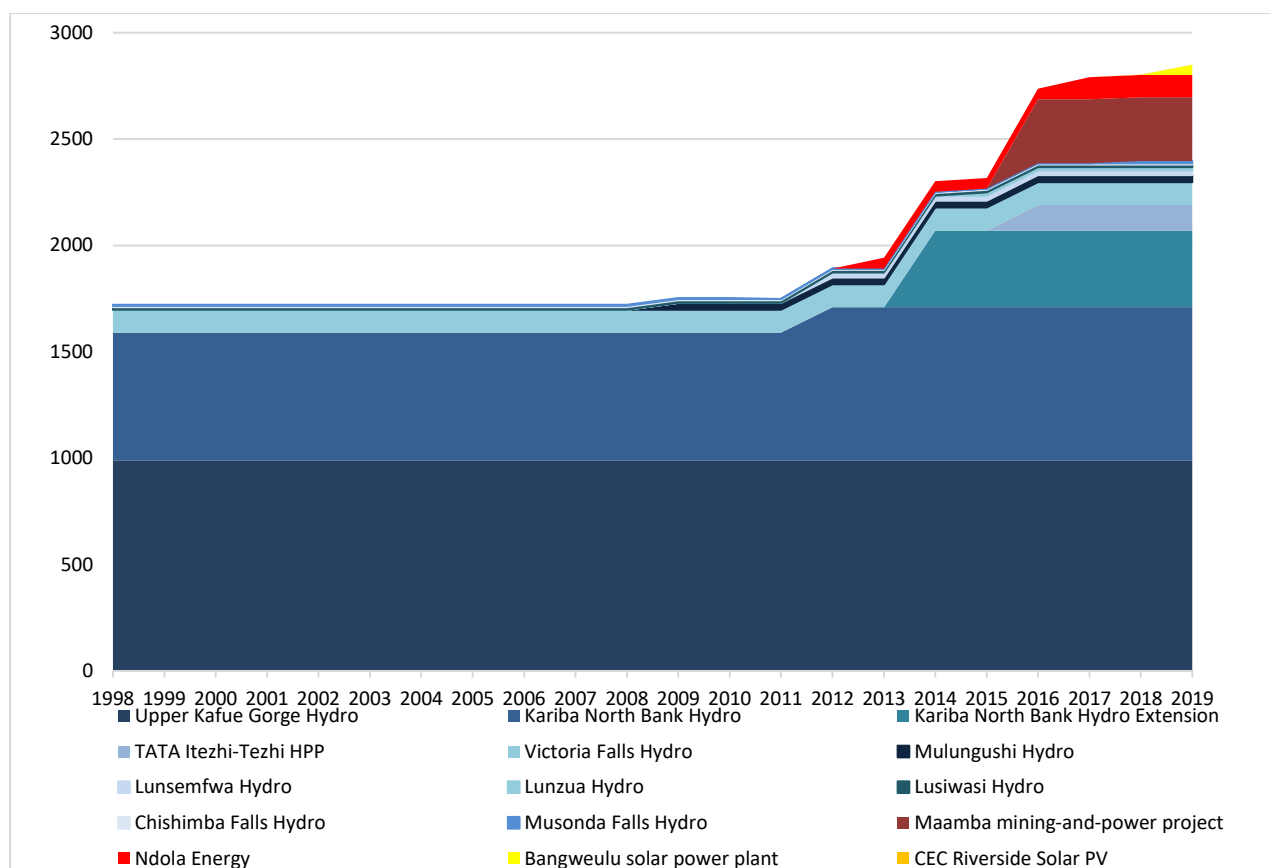


Figure 1: Installed electricity generation capacity, Zambia

Note: Blue = Hydropower. Red = Thermal power. Yellow = Solar PV.

The 2015 shock precipitated a financial crisis at ZESCO. Emergency power purchases from the Southern African Power Pool (SAPP)⁶ (including emergency power barges anchored on the Mozambican coast) caused ZESCO to run up hundreds of millions of dollars in debt⁷, which it has not been repaying. It also had to buy expensive power from thermal-based IPPs (US\$ 10/kWh) while electricity retail tariffs (US\$ 6/kWh) have remained at below cost-reflective levels. Most worrying for investors is ZESCO's failure to pay these IPPs – including some of its newest suppliers, most notably the Maamba coal power station – on a timely basis or at all.

Zambia's electricity sector remains in dire straits despite government's attempts to address the crisis. Electricity tariffs were increased by 75% in 2017⁸ and the regulatory act was amended to include the mines and their electricity supply contracts in the regulator's ambit. Historically, the mines were supplied through bilateral contracts (bulk supply agreements) with ZESCO, though the legitimacy of these contracts has been challenged in recent years through ad hoc tariff increases outside of the contracts. ZESCO is set to shed many jobs in coming months and loadshedding remains a daily reality.

⁶ Imports from Aggreko were pegged at USDc 18,8/kWh, while Karpower cost USDc 16,7/kWh. Imports from Mozambique cost USDc 7,6/kWh and the average SAPP tariff on imports from the day ahead market was USDc 6,7/kWh in October 2015 (Batidzirai, Moyo and Kapembwa, 2018).

⁷ This debt burden rapidly increased through the dramatic depreciation of the kwacha in 2015.

⁸ ERB approved increases in tariffs that were reversed by government in 2016 due to presidential elections, but which have since been reinstated.

It is therefore all the more surprising that IPP investors have flocked to Zambia. As already mentioned, both Scaling Solar and the GET FiT solar PV auctions attracted significant international and local interest. In fact, the GET FiT solar PV auction took place around the same time that the World Bank decided to cancel the second round of Scaling Solar procurement due to concerns about ZESCO's financial health. Investors had to take a view on the World Bank's assessment of the risks involved and seem to have based their bidding and pricing decisions largely on the quality of the procurement programmes and supporting international institutions rather than the fundamentals of the Zambian electricity sector investment climate. It is vital to unpack and understand the design of both auction programmes before completing an analysis of the management and governance structures used.

3 Renewable energy tendering programmes

Scaling Solar

Scaling Solar was the first competitive tendering programme for renewable IPPs in Zambia and followed closely on the heels of the successful renewable energy (RE) auction programmes in South Africa and Uganda. It was developed in response to the IFC's analysis of 20 promising solar markets in Africa, which found that large project developers were avoiding the region due to limited market sizes and a host of risks, costs and uncertainties. The IFC sought to emulate the success of South Africa's REIPP procurement programme, and identified scale, transparent competition, a bankable contractual framework and repetition as key success factors. But it also recognised that not all sub-Saharan African governments could, or wanted to, dedicate vast resources to renewable energy programmes. Many sub-Saharan African countries did not have sufficiently deep financial markets, and there were various constraints caused by the small power markets in most of these countries. The off-taker credit quality and political uncertainties were also significant risk factors for investors in the area (Fergusson, Croft and Charafi, 2015). Scaling Solar sought to mitigate the risks and costs for host governments and investors alike by combining the abovementioned success factors in a comprehensive, multi-country programme conducted under the World Bank Group umbrella.

Zambia was the first country in which the Scaling Solar programme was implemented. Agreements to implement the Scaling Solar model have since been signed with Ethiopia, Madagascar, Senegal⁹, Angola, Togo and – significantly – Uzbekistan. The Industrial Development Corporation (IDC) of Zambia officially engaged the IFC as the lead transaction advisor. The approach taken in Zambia, and standard practice for the Scaling Solar programme, was focused on bringing solar PV projects of 50+ MW onto the grid within 24 months. It consisted of the following elements:

- Conducting initial feasibility studies, site selection and legal due diligence¹⁰
- Initiating a competitive bidding process with IFC acting as transaction advisor
- Developing a bankable, standardised contractual set of documents
- Offering stapled finance
- Offering additional risk mitigation instruments (e.g. PRG's, MIGA political risk insurance etc.)

Together, 'best practice' elements were meant to offer governments a standardised, straightforward solar PV procurement model with significant multilateral backing that translated into low tariffs and rapid project implementation. Thus far, the results seem to bear this out, with some notable but not unexpected hurdles along the way. Our analysis looks at exactly how this was done in the Zambian context, and what it might mean for the Scaling Solar programme going forward.

GET FiT Zambia

Deutsche Bank's Climate Change Advisors designed the GET FiT programme in response to the UN secretary-general's Advisory Group on Energy and Climate Change request for new concepts to drive renewable energy investment in low to middle-income countries in 2010. The

⁹ Awarded projects in Senegal reached financial close in July 2019.

¹⁰ This was supported by a US\$2 million grant from USAID's Power Africa programme in Zambia.

programme aimed to improve the enabling environment for private renewable energy projects by combining technical assistance (including developing standardised, bankable documentation), viability gap funding (in the form of premium payments on top of the existing feed-in tariffs), and project de-risking (through the provision of liquidity and termination support). Uganda was the first country that responded positively to this model. Donors, (including Department for International Development (DfID) and the Department of Energy and Climate Change both in the UK, the governments of Norway and Germany, and the European Commission's Africa Infrastructure Trust Fund) committed about US\$90 million to finance top-up payments. Launched in May 2013 and implemented by Germany's development bank, KfW, and Uganda's regulatory agency, ERA, Uganda's GET FiT programme procured fifteen projects in three rounds. These were mostly small hydro, but also bagasse and biomass¹¹, with project tariffs pre-determined in a feed-in tariff-like regime. In 2014, an additional procurement round was launched for solar PV, with projects competing for the award based on price. The two awarded solar PV projects reached financial close and commercial operation in record time, and at the time of commissioning were the two largest solar PV installations in East Africa.

During the time that the Ugandan programme was being implemented, the possibility of exporting the GET FiT model was being explored in countries like Mozambique and Zambia. The Zambian ministry of energy, which had been working on a feed-in tariff programme that was all but destroyed by the Scaling Solar results, agreed to use the GET FiT model to contract and implement smaller-scale renewable energy IPPs. Support provided by GET FiT (and funded by a €31 million grant from the German government) included the provision of standardised procurement and legal documentation, support for the project permitting and licensing process, support to ZESCO on renewable energy grid integration and running the procurement process. GET FiT Zambia would also provide top-up payments to eligible projects, but not for solar PV based on the technology's rapidly falling costs. It would also see a separate 5 MW micro-generation tender being launched with the explicit aim of promoting investment by Zambian firms.

Taking the bidding programmes into account, it is imperative to analyse the design elements of both the Scaling Solar and GET FiT auction programmes. The focus is honed into: how the auction volume was decided (the auction demand); where the projects would be built; who was allowed to bid, and how this was determined (qualification and compliance criteria); how the projects were evaluated and ranked; and which tools and mechanisms were used to ensure the commitment of bidders, as well as fair risk allocation between the host government and the off-taker (seller and buyer liabilities).

Auction demand

Planning remains a weak area of the Zambian electricity sector. In 2009, an electricity system development master plan was developed by the Energy Ministry, which had up to that point been working off a 1998 ZESCO plan. This 2009 plan has not been updated in the decade since its publication, and appears to have had little impact in terms of determining actual investment decisions. While Zambia's REFiT strategy mentions that a least-cost integrated resource plan

¹¹ Some of the biomass projects were later removed from the programme due to commercial challenges.

(IRP) will be developed in 2020, the practical reality is that the procurement volumes for both the Scaling Solar and GET FiT programmes were determined in a relatively ad hoc manner.

The Scaling Solar programme was meant to prop up the struggling national electricity system. As a consequence the 600 MW Scaling Solar allocation was also the capacity shortfall caused by the 2014/15 drought. This volume was divided into separate auction rounds: 100 MW in round 1, and 200 MW (later increased to 250 MW) in round 2. The initial 100 MW was further divided into two 50 MW projects, although the bid documentation allowed for some flexibility here: bidders could size their projects anywhere between 34 and 55 MW. Bidders were allowed to bid for both projects, but would only be awarded one.

The approach to setting the auction volume for the GET FiT programme was at first more cautious. The initial allocation for the entire programme was 50 MW. This was later increased to 200 MW over three years (2017-2020) covering multiple technologies (solar PV, hydro, geothermal, wind, biomass) after grid integration studies convinced ZESCO that the system would be able to handle that much renewable energy. Of this 200 MW, 100 MW was allocated to the solar PV auction – to be met by 5 x 20 MW projects¹². The auctioning authority maintained the right to adjust this volume post-bidding, which they did by increasing the solar PV allocation to 120 MW after bids had been submitted, based on the strong price results.

Site selection

The selection and preparation of project sites has been one of the more controversial features of the Zambian auctions. Zambia has a dual land tenure system, with both privately held and communally held land ownership models. The two programmes decided to deal with this fact in different ways.

In the Scaling Solar programme, sites were provided to bidders as part of a strategy to reduce programme costs and risks, as well as to ensure the rapid implementation of the projects. By doing this the procurer sought to ensure that the required transmission infrastructure was available and in place, and that required data (e.g. solar resource data), permits and other requirements could be handled and co-ordinated by the government. In addition, given the small size of the Zambian grid and the relatively large scale of the solar projects, it was important to ensure that projects were optimally sized and located.

The selection of the project sites, the provision of the grid connection and the collection of site data was handled by Zambian authorities. Site selection was carried out by the Zambian Development Authority (ZDA), with the Lusaka South Multi-facility Economic Zone (LSMFEZ) chosen as the location for the two projects¹³. Due to being located in this zone, projects would pay 0% tax on profits in the first five years of operation. Zambia's IDC leased the land for the two solar plants and on-leased it to the projects for the duration of the Power Purchase Agreement (PPA). This action theoretically reduced the project development and capital expenditure costs for developers. IDC provided site climatic studies, grid interconnection information, grid stability and integration studies, site surveys, environmental and social scoping reports, legal due diligence reports, tax and accounting due diligence reports. Many of these assessments were paid for by a grant from the USAID Power Africa programme. Projects were responsible for building and paying for shallow grid connection works up to the sites' substation. No additional "deep connection works" were required, and the necessary data

¹² Bidders could elect to submit smaller projects, since the 20 MW allocation was only a maximum. All bidders submitted projects at this size ceiling.

¹³ The project sites took up about 5% of the LSMFEZ.

as well as detailed specifications about the required Purchaser Interconnection Facilities was included in the PPA that was provided to bidders as part of the RFP documentation, as well as in the programme's "Virtual Data Room".

The environmental and social impact permitting processes, led by the IDC, needed to comply with the IFC's performance standards and is illustrative of the complexities involved in renewable energy project development in many African countries. The project sites had a protracted history of resettlement preceding the programme. As an example, one of the project sites was provided to the project company "clear and unencumbered" of human use and habitation. There were however two previous phases of government managed resettlement for the whole economic zone that affected 35 households living on one of the project sites (established using satellite imagery). In total 247 households were originally settled in the economic zone. A further 715 people depended on the site for farming purposes. As the area was a designated forest reserve, people were occupying and using the land illegally and could have been evicted. Government considered the 247 households living in the zone eligible for compensation and offered physical resettlement (including new land plots of 5-25 ha, temporary housing, relief food packages for three months, cash compensation and farming inputs) to a site more than 700km away. While 32 households opted for this relocation, the remaining 215 households opted for cash compensation. A further 20 households claimed that they had been mistakenly left out, and were physically resettled. In 2015, shortly before the Scaling Solar programme, there appears to have been opportunistic settlement by 295 persons, that were moved to a village about 30km away¹⁴.

The site selection and preparation processes caused serious implementation delays for both projects. Significant sinkholes were found on both sites, although the geotechnical assessments provided by the IDC were not detailed enough to allow bidders to fully cost the implications of it. The problem was severe enough to cause at least one major engineering, procurement and construction (EPC) company to pull out of the programme. One of the project sites also bordered on a conservation area which, upon closer investigation, turned out to actually extend onto the site. This required a change in law to allow the site to be used for its intended purpose, pushing out the project's COD by at least a year. The fact that the IDC expressly stated during the prequalification Q&A process that further site due diligence was not needed, only exacerbates these oversights and makes them all the more glaring. It seems that instead of reducing costs and project development timelines, the government-led site selection process had the opposite effect (Kruger, Stritzke and Trotter, 2019).

Learning from the site-related challenges of the Scaling Solar process, and based on the approach taken in Uganda, the GET FiT programme required bidders to find and prepare their own project sites. This included the provision of a draft Environmental Brief compliant with IFC Social and Environmental performance standards as a key bidding requirement. In general the programme went to great lengths to ensure that the upfront transaction costs for bidders and Zambian authorities were kept as low as possible without compromising project quality.

The GET FiT programme used various measures to mitigate the risk of projects being located too far from the grid or causing significant additional costs to the grid operator. Projects could be located no more than 10km away from the nearest grid connection and would be responsible for shallow grid connection costs, including land rights and construction which were to be handed over to ZESCO at COD. Bids would also be screened after the prequalification stage for their impact on the grid. An interim rapid grid impact assessment (IRGA) based on power flow analyses aimed to confirm grid availability at the proposed connection points for

¹⁴ In Nov 2016 these people were still staying in temporary housing, waiting for land.

shortlisted projects. Bidders had to ensure that their project was connecting to a substation able to handle its capacity¹⁵. A grid stability study, funded by KfW, divided ZESCO substations into four categories (see Appendix B: Classification: ZESCO substations - grid connection of PV plant):

- A – able to handle 20 MW PV
- B – able to handle 10 MW PV
- B+ – able to handle 10 MW if IPP provides a 5 MVar reactor
- C – Unable to handle 10 MW PV

A project site rejected at the IRGA stage was not automatically rejected, nor was one accepted during the Request for Quotation (RfQ) stages automatically approved. If a bidder was convinced that the reasons for rejection could be addressed through additional investment in the shallow grid connection, it could present appropriate solution as part of its proposal. Bidders could also change their sites after this assessment. If this was done within two weeks then a second analysis could be done. If not, bidders would have to proceed with the alternative site without this assessment. The IRGA did not consider cumulative impacts (congestion) of projects on the grid. ZESCO and GET FiT also needed to make a final determination on the compatibility of proposed connection points at time of final award. If two or more projects caused congestion at a point, the available capacities would be awarded competitively and higher ranked projects would be prioritised. The risk for congestion would lie entirely with the bidder. No projects that required additional investments beyond shallow grid connection would be supported.

Bidders that wanted to use traditional or customary land for their projects furthermore needed to show that they had unwavering support from the traditional authorities for the conversion of the land. Land title deeds were not required at the bidding stage, but for the interim grid assessment, shortlisted bidders planning to use traditional or customary land needed to provide an undertaking from the relevant chief. This was submitted in a form provided by the government of Zambia that should the proposed site be selected, the chief would promptly execute “Form 2 of the Lands (Customary Tenure) (Conversion) Regulations” and support the bidders’ application. Customary or traditional land would need to be converted into statutory or leasehold tenure land in line with the Lands Act (1995) and subsidiary legislation, including the Lands Regulation and IFC performance standards. Uncertainty around the conversion process for traditional land could count against projects in terms of bid scoring on implementation timeline, which seemed to disincentivise bidders from using traditional land. Bidders could also provide a (conditional) lease contract/land title or MoU for a lease contract on freehold land that was valid for the length of the PPA plus an additional 18 months.

¹⁵ Substations dedicated to Scaling Solar rounds 1 and 2 projects would also not be eligible. During the prequalification process ZESCO also informed KfW that they would be building a 100 MW PV project with MASEN (Morocco), and that four substations would not be eligible anymore.

Qualification and compliance requirements

Both Scaling Solar and GET FiT made use of a 2-step bidding process, with a prequalification phase followed by the request for proposal documentation being released to shortlisted bidders (Table 3). Both programmes also had a relatively short period between the launch of the RfQ documentation and the RfQ submission deadline (5 – 6 weeks), although the GET FIT RfQ process was preceded by a lengthy pre-bid clarification phase, including three clarification notices and a compulsory pre-bid meeting. This is not surprising given that GET FiT projects needed to submit project specific details as part of the RfQ process, which was not included for Scaling Solar. Scaling Solar projects had about 2 months to prepare their final bids, vs. 3 months for GET FIT.

Table 3: Timelines for Scaling Solar Round 1 and GET FiT solar PV

Phase	Scaling Solar Round 1	GET FiT
	Date	Date
	-	
Bid Announcement	-	11 December 2017
Clarification of Announcement #1	-	21 December 2017
Clarification of Announcement #2	-	5 February 2018
General Guidance Note on Environmental & Social Standards	-	5 February 2018
Pre-bid meeting	-	7 February 2018 ¹⁶
Clarification of Announcement #3	-	14 February 2018
RFQ Launched	5 October 2015	9 April 2018
RFQ Clarification Meeting	23 October 2015	
RFQ Clarification requests deadline	30 October 2015	27 April 2018 ¹⁷
RFQ Clarification notice	1 November 2015 161 Questions	
RFQ Submission deadline	13 November 2015 48 submissions	18 May 2018 41 submissions
Interim Rapid Grid Assessment	-	4 June-13 July*
Prequalified bidders announced	16 February 2016 (11 shortlisted)	20 June 2018 ¹⁸ (10 shortlisted)
RFP released	16 February 2016	31 August 2018 ¹⁹
RFP comments deadline		
RFP submission deadline	8 April 2016 14 proposals from 7 bidders	29 November 2018 ²⁰ 15 proposals from 8 bidders
Winner Announcement	27 May 2016 2 winners, 2 projects	5 April 2019 ²¹ 3 winners, representing 6 projects

¹⁶ Not compulsory.

¹⁷ Originally 25 April 2018.

¹⁸ Originally planned for June 1st 2018.

¹⁹ Originally planned for July 15th 2018.

²⁰ Originally planned for October 1st, 2018.

²¹ Originally planned for December 15th, 2018.

Financial Close	21 December 2017 (Neoen/First Solar) July 2018 (ENEL) ²²	-
Project COD	11 March 2019 (Neoen/First Solar) 29 April 2019 (ENEL)	-

Both programmes attracted substantial interest, with 48 submissions for Scaling Solar and 41 for GET FiT. The qualification process for both programmes was quite stringent, with 11 firms prequalifying for Scaling Solar Round 1 and 10 for GET FiT. For Scaling Solar Round 2, which has not proceeded past the prequalification phase, only 8 firms were shortlisted. Interestingly, about half of the bidders that prequalified for Scaling Solar also prequalified for GET FiT (Table 4). GET FiT also set an upper limit on the number of projects (20) that could prequalify to control transaction costs, based on a ranking that would take into account a bidder's global solar PV IPP record (for projects operational for more than 1 year, with minimum performance standards), African renewable energy IPP record and Zambian shareholding.

Table 4: Shortlisted bidders, Scaling Solar Rounds 1 & 2 and GET FiT solar PV

Scaling Solar Round 1	Bid submitted	Scaling Solar Round 2	GET FiT solar	Bid submitted
Scatec Solar	No	Scatec Solar	Scatec Solar	Yes
Access Eren Zambia	Yes	Nareva Holdings	Building Energy	Yes
Mulilo Zambia PV consortium	Yes	Acciona Energy, Swicorp, Enara Bahrain	Mulilo Group	No
Neoen/First Solar	Yes	Mitsui & Company	Innovent SAS & Copperbelt Energy Corporation (CEC)	Yes
International Power SA/Engie	No	Engie Global Developments	Engie Afrique	Yes
Enel Green Power	Yes	Enel Green Power	Enel Green Power	Yes
Globeleq	Yes	Globeleq, FRV	Globeleq & Aurora Power Solutions	Yes
Shangai Electric/Avic	Yes	Tata power Company Limited	Phanes Group	Yes
EDF Energies Nouvelles Africa	Yes		EDF Energies Nouvelles	Yes
Infrastructure Fund2/Old Mutual/Cobra/CDE	No		SolarReserve Development Co	No
Grupo-T Solar	No			

Neither programme saw all prequalified bidders submitting proposals: for Scaling Solar, only seven of the 11 prequalified firms submitted a bid, while only eight of the 10 prequalified GET FiT bidders submitted full proposals. One prequalified bidder explained their decision for not proceeding with a full proposal by pointing out that the pool of prequalified bidders included large international utilities, who would almost inevitably end up outpricing competitors based on their economies of scale and the ability to corporate finance projects. This proved to be more or less correct, with one of the Scaling Solar projects being awarded to Enel Green Power, a subsidiary of Italy's utility Enel. The other project was however awarded to a much smaller developer (Neoen). This dynamic played out differently in the GET FiT programme, with none

²² While financial documents were signed in July 2018, the drawdown has not happened yet since a number of Conditions Precedent have not yet been met. Construction on the plant however started in August 2018.

of the three winning bidders being linked to an international utility, despite three utility-linked consortia having qualified.

Qualification criteria

Legal and technical compliance

Both the Scaling Solar and GET FiT programmes made use of stringent qualification criteria to screen potential bidders. During the prequalification stages, firms had to prove that they had the ability to build, finance and operate the proposed projects based on their track record. Bidders wanting to qualify for Scaling Solar needed to prove that they had financed, built, and operated at least one of the following:

- one or more grid-connected PV plant in Africa of at least 25 MW;
- one or more grid connected power plant in Africa of 75 MW;
- three grid connected PV plants, each in different countries in any region of the world, with a minimum aggregate installed capacity of 100 MW;
- one or more grid connected power plant of any technology anywhere with a minimum aggregate capacity of 1500 MW.

These requirements were viewed as particularly stringent by the market, motivated by the IFC's desire to specifically attract large, international developers to the African market.

The GET FiT reputation-based qualification requirements were both more specific and slightly less restrictive, allowing smaller players to qualify while also restricting qualifying projects to renewable energy based installations. Specifically, interested bidders²³ needed to prove that they had at least 30% shareholding in projects²⁴ meeting one of the following requirements:

- Two on-grid PV²⁵ projects developed, constructed and commissioned²⁶ on an IPP basis with minimum installed capacity of 5 MW each in Africa after 2012, or
- A minimum of 100 MW cumulative installed capacity of solar PV projects developed, constructed and commission on an IPP basis in Africa after 2012, or
- Minimum of 500 MW solar PV IPP projects having reached FC²⁷ globally, or
- Minimum 750 MW RET-based IPP projected having reached FC globally.

In addition at least one of these projects needed to be a solar PV project not based in a developed country²⁸.

GET FiT also ranked projects (due to the restriction on the number of bidders that could prequalify) based on the following formula:

²³ In case of a consortium, a consortium member's reference project would only be accounted for if the member had a minimum shareholding of 30% in the SPV.

²⁴ This shareholding needed to be in place prior to the project reaching COD (or financial close, in the case of projects not yet at COD), and still applied even if the project has since been sold.

²⁵ Qualifying PV projects need to have been operational for at least one year, with a minimum average performance ration of 78% in year 1.

²⁶ Projects needed to have been commissioned in the last 10 years to qualify.

²⁷ When all project and financing agreements have been signed and all CPs to drawdown have been reached. Financial close must have been achieved in the past five years.

²⁸ Australia, Austria, Belgium, Canada, Chile, China, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, India, Ireland, Israel, Italy, Japan, Korea, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Slovak Republic, Slovenia, Sweden, Switzerland, Turkey, the UK, USA.

Aggregate sums for bidder members with at least 30% shareholding =
Total MW of globally installed solar PV in IPP basis (global solar score)
+ Total MW of IPP capacity having reached FC in Africa in last 5 years
X by number of RE IPP projects having reached FC in Africa in last 5 years (Africa RE IPP score)
+ Percentage points of (envisioned) Zambian ownership/shareholding through Zambian companies (Zambian content score)

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Legal and technical qualification requirements were largely similar across the programmes, with bidders needing to provide letters of confirmation, registration documents, ownership declarations, organisation charts, evidence that they were not being investigated, and had not been convicted of fraudulent or similar misconduct. For Scaling Solar, bidders were not required to register a SPV in Zambia prior to bidding, as this would be done (together with the IDC) post-award. While bidders in the GET FiT programme did not need to have an SPV incorporated as part of their full proposal, it was considered as part of the evaluation process. The SPV shareholding could not be changed up to COD, except for shareholders owning less than 20% of the project to allow local investors to be incorporated, and then only up until the RFP submission deadline. If Zambian company shareholding changed, it needed to be replaced by Zambian shareholding or might otherwise lead to disqualification. GET FiT projects were also required to be at a pre-feasibility stage at the point of bidding, although no minimum requirements on licensing and approvals were imposed. However having obtained these permits would count in the bidders' favour and was taken into account in the bidder ranking process.

Technical requirements were harmonised across both programmes, largely to enable the GET FiT projects to benefit from the path-clearing work done by the Scaling Solar projects in the licensing process. Bidders were provided with indicative equipment specifications as part of the pre-qualification round, with various technical standards and certifications in place for modules, inverters, power transformers, and mounting. The technical specifications were less stringent than in Uganda's GET FiT programme and specifically allowed for tracking equipment and bifacial modules to be used. During the Scaling Solar RFP phase, bidders were additionally required to provide project reference details of EPC and O&M contractors and needed to provide evidence of equipment manufacturers' capacity. It could be either through having installed more than 10,000 MW, or having a manufacturing capacity of 500 MW per year (minimum).

Financial and commercial capability

Both programmes assessed bidders' financial ability as part of the qualification process. In the Scaling Solar programme, this was done by assessing the net worth of bidders (minimum: US\$75 million if a single bidder). The same process was followed with a bidding consortium, but with the lead sponsor making up at least half and the net worth to total assets ratio (15% minimum if single bidder; 20% if consortium). To encourage local participation, a special multiplier of 1,5 was applied to the net worth of Zambian companies to help them pass this test. GET FiT made use of lower thresholds, with bidders' assets needing to total at least US\$25 million, the equity to total assets ratio needing to be at least 10% and the current ratio to be above 0,75%. All consortium partners – in both programmes – also needed to submit audited financial statements.

Bidders were also required by both programmes to submit signed term sheets from lenders; in the case of Scaling Solar, part of these could be replaced by a signed letter indicating that bidders would be using the stapled finance offered by the IFC. This requirement served to bring projects closer to financial close by requiring a first level of due diligence from lenders prior to bid submission. Finally, bidders needed to submit full financial models based on templates provided by the procurers.

Environmental and social sustainability

Both bidding programmes required bidder compliance with the IFC's Environment and Social Performance Standards – the globally recognised gold standard for infrastructure impact mitigation and management. The Scaling Solar programme only considered these requirements as part of the qualification process, while in the GET FiT programme these formed part of both the qualification and evaluation criteria. GET FiT Zambia bidders needed to submit E&S management plans, as well as appropriate permits²⁹, as part of their bid package. It is vital to note that while bidders were evaluated on the degree of E&S analysis and management in the Ugandan GET FiT programme, the Zambian programme only considered whether projects had completed a draft environmental project brief³⁰ – a key requirement for moving towards financial close – in its evaluation matrix. Therefore the concern in the Zambian programme appears to have shifted more explicitly to the impact of E&S management issues on the project realisation timeline.

It is worth observing how the IFC performance standards translated into actual commitments. As an example, one of the Scaling Solar projects offered a range of benefits, such as improved social services, access to credit, and/or livelihood improvement measures funded by 0,5% of the annual project revenue to the local community. The project also committed to appointing a full-time community liaison officer. This was based on stakeholder engagements with nearby villages (5-9km from the site) that had started in 2015 and included several rounds of public consultation, each time attended by about 200 people. It is interesting that legacy issues from the government resettlement programme were brought up during these meetings, but then referred back to Zambian government agencies. This points possibly to some residual community-based project risks from the government site selection process.

The treatment of local content also differed between the two programmes. During the clarification process of the first round of bidding for Scaling Solar, the IDC explicitly stated that imposing local content requirements would result in higher project costs, resulting in Zambian electricity consumers subsidising “a few fortunate Zambian firms”. While not an explicit qualification or evaluation criterion in the GET FiT programme, the Implementation Agreement still requires that a percentage of project management and general staff are appropriately trained Zambian staff, and that this percentage increases over time. GET FiT bidders were also required to use local content where it was comparable in terms of costs and quality to international goods.

Effectively dealing with environmental and social issues has been challenging for both programmes. As discussed, the Scaling Solar sites came with their own risks and uncertainties – some technical or bureaucratic, but others of a softer (social) kind that requires ongoing management throughout the project's lifetime. It is still undecided as to whether government's deep involvement in the Scaling Solar site selection and preparation processes resulted in fewer

²⁹ Full ZEMA approval was not required at the point of bidding.

³⁰ The bidding authorities admitted that the timelines were probably too tight to allow for a full Environmental Project Brief to be developed, and would therefore accept a draft version as part of the bid evaluation process.

or less severe, or more or less high impact risks for the projects. The GET FiT programme in Uganda has also experienced difficulties in helping projects to effectively deal with these risks, with one project having its award revoked after a prolonged period of failing to comply with the IFC’s standards. Bidders in the Ugandan programmes also complained about the lack of detailed, harmonised guidance on compliance with the standards and reporting requirements, especially since the GET FiT secretariat, project lenders, and Ugandan authorities all used different interpretations. While the Zambian GET FiT projects are yet to reach financial close and commercial operation, the E&S requirements (and perhaps the lack of detailed enough guidance) have already caused two projects to be disqualified during the evaluation process – a decision that is now being officially challenged by one of the affected bidders.

Bidder ranking and winner selection

The bid evaluation and ranking processes for the Scaling Solar and GET FiT programmes were relatively similar, although there were notable differences in the ranking criteria used. Both programmes used a pay-as-bid type auction so that bidders submitted the price that they knew they would be paid in case they won the bid. Both programmes also made use of a sealed bid process that would see technical (and commercial) bids first needing to pass a compliance test before financial bids could be opened.

For Scaling Solar, the bidders were required to submit three sealed parts of their proposal:

- A technical proposal, covering all technical aspects of the proposed plant;
- A commercial proposal, which contained an offer letter, “Project Agreement Information Schedule”³¹, debt financing term sheets, details on any guarantees or insurance products to be used, and a bid bond; and
- A financial proposal, providing the proposed energy charge in US\$/kWh.

Bidders were allowed to bid on both sites (and all did), but would only be awarded one of the projects – which ensured some hedging of non-delivery risk for the IDC.

In the GET FiT programme, bidders submitted only a technical (Table 5) and financial (Table 6) proposal. Projects were expected to at least be at a pre-feasibility stage by the time they were submitted and technical proposals were checked for completeness and compliance before being evaluated (Figure 2). Because bidders were providing their own project sites, the GET FiT technical evaluation process also included a site visit.

Table 5: Technical Proposal Documentation: GET FiT Zambia

Document	Required content
Technical	
Detailed description of site and boundary areas	Site co-ordinates, scale drawing, description of topography, topsoil conditions, obstacles, description of access conditions and restrictions.
Detailed description of the conceptual design of the PV plant	Modules, mounting structure, inverters, power transformers, shallow grid connection, balance of plant, O&M procedures.
Site specific yield report	Data sources, incorporation of design concepts, losses due to shading, soiling, cabling; annual and monthly production estimates, yield for year 1, P50 & P90 estimates for year 1, 10 and 20.

³¹ Bidders completed schedules 1 and 2 of the RFP, which would be directly inserted into the PPA and signed on bid award.

Electrical single diagram	Ownership and operational boundaries, delivery point, substation, shallow grid connection.
PQ capability diagram	
<i>Environmental & Social Sustainability</i>	
Draft environmental project brief	E&S min requirements.
Corporate environmental and social management system	As above.
<i>Legal</i>	
Consortium agreement	Division of tasks, internal organisation and management, liability, indemnification, confidentiality.
If above not yet executed: MoU for consortium agreement Draft consortium agreement	

Table 6: Financial Proposal Documentation: GET FiT Zambia

Document	Required content
<i>Financial</i>	
Financial model	For each project; plus separate financial models for conditional bids.
Initialled term sheet from each envisioned lender and/or guarantee provider	Max/intended amount of loan/coverage; applicable interest rates/pricing; fees; tenor; E&S standards; conditions for final approval; term sheet shall also include statement by each lender/provider to provide the loan/coverage, conditional upon final due diligence.
Site specific yield report	Data sources, incorporation of design concepts, losses due to shading, soiling, cabling; annual and monthly production estimates, yield for year 1, P50 & P90 estimates for year 1, 10 and 20.
Signed letter of support from equity providers	Availability of required amount (liquid assets); commitment to invest; commitment to make available equity to develop project and bring it to FC in 12-18 months.

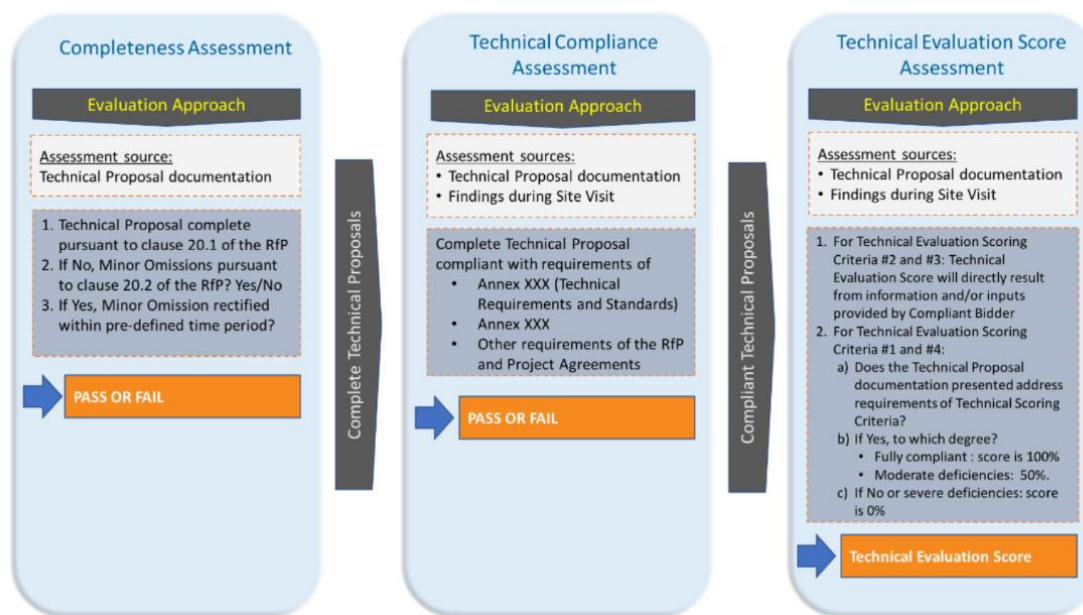


Figure 2: Technical evaluation process stages: GET FiT Zambia

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The GET FiT evaluation process included two additional innovative clauses. Bidders had to submit unconditional financial bids for each project, and could submit a conditional financial bid in case an award was received for both submitted projects (for those bidders that chose to bid for two projects). This approach allowed the auctioneers to potentially benefit from economies of scale by allowing bidders to combine projects in order to achieve better pricing results. The financial bids were also beholden to a procurement clause which determined that if the project did not reach commercial operation in 18 months from its award, the financial bid could be adjusted proportionally to the degree by which the costs for PV modules have fallen (or increased) against an international benchmark price.

The Scaling Solar programme is the only programme in the sub-Saharan region (to date) to base bidder ranking on financial criteria alone. Every other SSA renewable energy auction (including GET FiT Zambia) has based project evaluation on some combination of financial and technical/social & environmental scores, despite the theoretical and practical problems noted with this approach in the literature (Manelli and Vincent, 1995; Burguet and Che, 2007; Estache, A; Iimi, A; Ruzzier, 2009). Scaling Solar's exclusive use of price as evaluation criterion was meant to signal to the market how important a good price outcome was for the programme, as well as to allow for transparent, simple evaluation. Uganda's GET FiT programme used a range of technical criteria to score and rank projects, which has not been without its share of criticism (Kruger and Eberhard, 2018). One would perhaps have expected the Zambian GET FiT auction to follow in the footsteps of the Scaling Solar scoring approach, yet this was made impossible by KfW's procurement policies that required technical scoring alongside price.

The GET FiT programme therefore made use of a combined scoring approach that was weighted on a 80:20 basis in favour of price. The scoring methodology (Table 7 and Table 8) that determined the remaining 20 points aimed to incentivise increased project preparation and rapid realisation commitments. This approach has previously been criticised for failing to translate into actual results, with minimal impact on the Zambian grid (in terms of system losses), and the local capacity building and training. As the winning bidders were only announced in March 2019, it remains to be seen what impact these criteria had in terms of

project implementation. The GET FiT secretariat also offered detailed guidance to bidders in terms of the technical evaluation scoring criteria (summarised in Table 8 below), which was further elaborated on and explained during the clarification rounds of the bidding process.

Table 7: Scoring methodology for Technical Evaluation Score: GET FiT Zambia

Technical evaluation score criterion	Assessment
1. Project maturity	To what degree does the quality and substance of project documentation represented reflect a mature project?
2. Scheduled commercial operation date (COD) as per PPA	The sooner a project can reach COD after its effective PPA date, the more points it will be awarded, ranging from 7 to 11 months.
3. Contribution to total system losses	The degree to which the PV plant will contribute to system losses.
4. Local capacity building and training	To what degree does the quality and substance of project documentation represented reflect a strong local capacity building and training programme?

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To decide on winning bidders, the GET FiT investment committee first met to review the technical proposals as evaluated by the tender agent. In this case, also the GET FiT secretariat. Financial bids were only opened for bidders passing the investment committee technical evaluation stage. After projects were evaluated and ranked, a cumulative grid impact assessment was conducted that could still lead to the rejection of any project if it was found to lead to significant grid congestion. The final award decision also required a no-objection from KfW.

Table 8: Technical Evaluation Score Criteria: GET FiT Zambia

1. PROJECT READINESS	
A. Technical: details of the project site, resources and contracts	20
B. Additional Environmental & Social Risk Mitigation	10
C. Land Acquisition: level of execution of land agreement	5
D. Any other documented Project Preparation activities tangibly benefiting project maturity and expected Project Preparation timelines	5
2. SCHEDULED COMMERCIAL OPERATION DATE AS PER PPA	20
3. CONTRIBUTION TO TOTAL SYSTEM LOSSES	25
4. LOCAL CAPACITY BUILDING AND TRAINING	15
TOTAL	100

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Seller and buyer liabilities

Financial prequalifications and penalties

The Scaling Solar and GET FiT programmes made use of a number of financial prequalification and penalty instruments to ensure compliance and commitment from bidders. Financial prequalification instruments, such as bid bonds, generally serve two purposes: they signal that bidders have the financial capacity to realise the project, and they serve as a possible penalty in the case of a bidder failing to stand behind their bid. Scaling Solar bidders were required to post a bid bond of US\$1,3 million per project – or US\$26,000 per MW (assuming that the proposed project is 50 MW), making it the most expensive bid bond yet in the SSA region. The GET FiT Zambia bid bond was set at US\$15,000 per MW. While cheaper than the Scaling Solar bond,

it was still US\$5,000 per MW more than in the Ugandan version of the programme and US\$7,000 more than in the South African renewable energy auction. Setting a bid bond level too high may decrease the number of bidders able or willing to submit a bid, which leads to reduced competition and potentially higher prices (Kreiss, Ehrhart and Haufe, 2017). Both programmes had strong market responses in the prequalification stages and while the eventual number of proposals submitted were not that many – in large part also due to very stringent prequalification criteria – they were from strong bidders. Also in evidence were the record-breaking prices and the fact that successful bidders signed the contract agreements, which together seems to show that these bond levels were effective in achieving their intended purpose.

Winning Scaling Solar bidders were also required to post a performance bond of US\$15 million – which in reality seems to have acted more as a construction bond as it was set to expire after the project reached its COD (similar to GET FiT Uganda). According to the bidding contracts, failure by projects to complete commissioning by the longstop COD would not only result in the bond being called, but also in the PPA being terminated. A similar termination clause is contained in the GET FiT Zambia documentation. In reality, neither the bond nor the termination clause were called upon, despite the Scaling Solar projects being more than a year late on delivery. This has mainly been attributed to the fact that many of the factors causing the delays were within the control of the Zambian government or ZESCO. But it also forms part of a bigger global trend where auctioneers are increasingly reluctant to penalise or terminate projects (which is in effect what calling on the performance bond would also do) once a project is awarded. This reluctance to use penalty mechanisms undermines their *raison d'être* and has in some cases ultimately led bidders to disregard them. It also points to the fact that penalty regimes – especially of the “binary” kind – are perhaps not well suited to ensuring timely project realisation outcomes.

The GET FiT Zambia programme chose to incentivise timely project realisation through introducing liquidated damages clauses (US\$500/MW per day delay, up to a capped amount) in the project contracts, instead of performance bonds. This is a departure from the programme’s approach in Uganda, where a series of increasingly expensive performance bonds (in addition to liquidated damages provisions) were used to cover the project periods up to and including financial close and COD.

Both Scaling Solar and GET FiT also used liquidated damages to incentivise project performance: winning Scaling Solar projects were expected to pass a PV plant performance ratio test (85% threshold, based on the estimated PV plant performance ratio) as part of the test signalling the COD. The PV plant performance ratio would also be calculated at the end of each contract year. If the project failed to achieve an annual PV plant performance ratio of at least 75% of the estimated PV plant performance ratio, the project would have to pay ZESCO liquidated damages at the rate of US\$7500 for every 0,1% below 75%. The total liquidated damages payable was limited to US\$750,000 per year. The GET FiT programme required bidders to pay only US\$150 for each 0,1% if a project’s annual performance ratio fell below 90% of the estimated annual performance ratio for that year, capped at US\$15,000 per MW.

The type of penalty regime employed can impact a project’s price level. The incentive created by the penalty regime also needs to align with the goal it wants to achieve to be effective. Performance bonds are generally seen as binary penalty regimes where either the full amount gets called, or none of it is used. While liquidated damages clauses act in a more gradual, progressive fashion. Using binary penalty regimes have been shown to increase project risks, leading to a higher cost of capital for projects (AURES Consortium, 2019). Nonetheless, both progressive and binary penalty regimes have a negative impact on a project’s realisation probability, since using them would mean causing even more pain to a project that is already

in distress. Late project delivery or poor technical performance already have a financial impact on the project. Imposing financial penalties is unlikely to help the project overcome whatever problems are keeping it from performing. Where penalties are warranted is where the financial impacts might not be immediate or direct for the project like controlling environmental and social performance. Scaling Solar's use of a decommissioning bond of US\$100,000 per MW (US\$5 million for a 50 MW plant) seems to conform to this idea. Likewise GET FiT Zambia's approach of requiring a performance bond (US\$100,000) to cover projects' IFC E&S performance standards commitments makes sense. Although it could be argued that a liquidated damages clause might have been as effective without necessarily increasing the projects' risk-based cost of capital³².

Buyer liabilities

Both investors and the Zambian government face significant inflation- and currency-related financial risks over the lifetime of the projects. ZESCO provided winning bidders in both programmes with 25-year PPAs. For Scaling Solar, tariffs were non-indexed over that period, while for GET FiT only the O&M component of the tariff (up to a maximum of 10%) was indexed to the United States Consumer Price Index (US CPI). Winning bid tariffs were thus significantly lower in real terms than what was initially announced as the winning bid prices, further underscoring the ground-breaking nature of these tariffs. For both programmes tariffs were denominated in US dollars in deference to the lending requirements of international financiers (including DFIs). This potentially exposed the Zambian government to significant foreign exchange risks, especially given the significant depreciation of the local currency in recent years. This exposure is slightly offset by an unusual characteristic of the Zambian power market: the mines, which consume about 40-60% of the country's electricity, pay their electricity tariffs in US dollars and can therefore help to cover this gap.

The risks for transmission infrastructure provision to the projects as well as power dispatch was fully allocated to ZESCO as the most appropriate institution able to manage these risks. The PPA contained a take-or-pay clause that required ZESCO to pay for all power produced by the projects, regardless of whether it needed it at that point in time. If ZESCO was for some reason unable to take delivery of any power produced, it would provide projects with deemed energy payments. This is a standard requirement in most renewable energy PPAs since these sources are non-dispatchable. Because ZESCO was providing the grid connection for the Scaling Solar projects, it was also liable for providing deemed energy payments in the case of delays with the provision of this infrastructure. The GET FiT programme had the further provision of early operating energy, which would see projects being paid 75% of their tariff for any electricity produced pre-COD, thereby incentivising early project delivery.

Securing the revenue stream and addressing off-taker risk

It is impossible to make sense of the price and investment outcomes of the Zambian auctions without understanding how the programmes sought to protect projects' revenue and mitigate investor risks. As ZESCO was in such poor financial shape, lenders required termination and payment or liquidity guarantees to be willing to provide debt. Both programmes made use of a range of guarantees and credit enhancement mechanisms – Scaling Solar arguably more so than

³² It still needs to be established whether the performance bond increased the cost of capital in the end.

GET FiT. Off-taker default and some *force majeure*³³ risks were covered in both programmes by a Government Support Agreement³⁴, initially developed for Scaling Solar. In the case of payment default by ZESCO, the government does not step into the shoes of the off-taker to assume responsibility for all PPA payments, as would be the case in a standard sovereign guarantee. Instead, the government buys the asset or shares in the project company at a pre-determined price meant to cover outstanding equity (plus returns) and debt and associated transaction costs (Table 9). Provisions for a prolonged local political *force majeure* event are more or less similar, though the purchase price will be reduced by any insurance proceeds.

Table 9: Termination clauses and provisions: GET FiT Zambia

Event	Who can terminate	Put/Call	Buyout Price
Seller/Company default	ZESCO/GRZ	Call	Outstanding Debt Termination Costs Transfer Costs
ZESCO/GRZ default	Seller	Put	Outstanding Debt Outstanding Equity Equity Return Termination Costs Transfer Costs
Prolonged local political <i>force majeure</i> event	Seller – 180 days ZESCO – 365 days	Put	Outstanding debt Outstanding Equity Equity Return Termination Costs Transfer Costs MINUS insurance proceeds (if any)
Prolonged foreign political <i>force majeure</i> event	Seller – 180 days ZESCO – 365 days	Call	Outstanding debt Termination Costs Transfer Costs MINUS insurance proceeds (if any)
Prolonged other <i>force majeure</i> event	Seller – 180 days ZESCO – 365 days	Call	Outstanding debt Termination Costs Transfer Costs MINUS insurance proceeds (if any)

The Scaling Solar auction also had relatively standard liquidity support mechanisms in place, including letters of credit, as well as World Bank Partial Risk Guarantees for payments and (if required by commercial lenders) loans. The letters of credit (from Standard Chartered) covered six months’ worth of PPA payments. The presence of the World Bank PRG’s meant that ZESCO did not have to cash collateralise the letters of credit, since the banks were essentially providing credit to the World Bank. The market opted for the payment guarantees but not the loan guarantees. This is not surprising considering that loans were being provided by DFIs. Figure 3 provides a visual representation of the various agreements in place around the Bangweulu Power Company, including the guarantees and credit enhancement mechanisms.

³³ If the bidder does everything right but is not granted a permit, this becomes a “lapse of consent” and in turn a local political FM event. If other *force majeure* events occur, 80% of the tariff would be payable while debt is outstanding. If all debt was paid off, only the O&M component of the tariff would be covered.

³⁴ This agreement included provisions for the possible unbundling of ZESCO that would ensure that the guarantee agreements would not be affected.

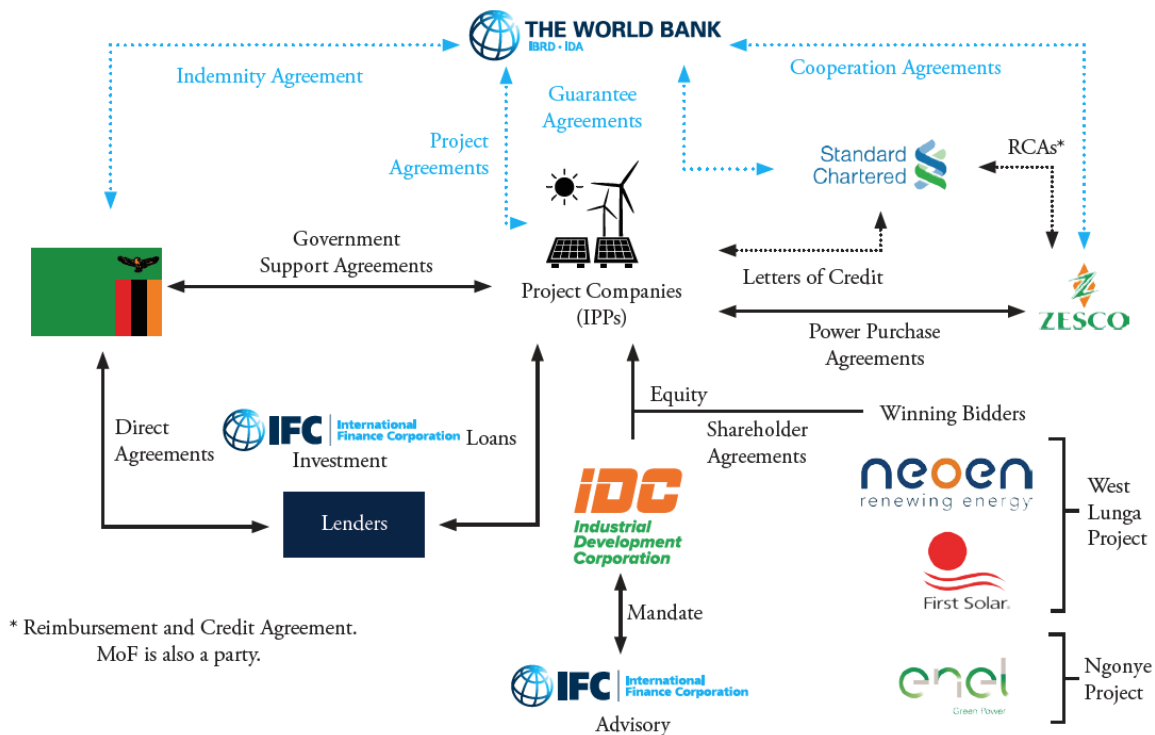


Figure 3: Scaling Solar Zambia: Structure and Contractual Agreements including guarantee structure

Payment guarantee support was provided by the Regional Liquidity Support Facility (RLSF) with GET FiT (Figure 4). This facility was initiated by KfW with grant funding from the German government. Many African utilities are typically not able or willing to provide the cash collateral needed to backstop commercial letters of credit. Through a mixture of grant funding (€31,6 million through KfW from the German government) and a matching guarantee from ATI, a letter of credit was provided by ABSA bank South Africa. ABSA was selected on a competitive basis, based on the bank's willingness to take on risks and its fee/cost structure. This letter covered nine months' of PPA payments and was valid for a maximum of 10 years. The cost of the letter was determined by the quality of risk, the formal comfort provided by the host government and off-taker, and the issuing bank handling charges.

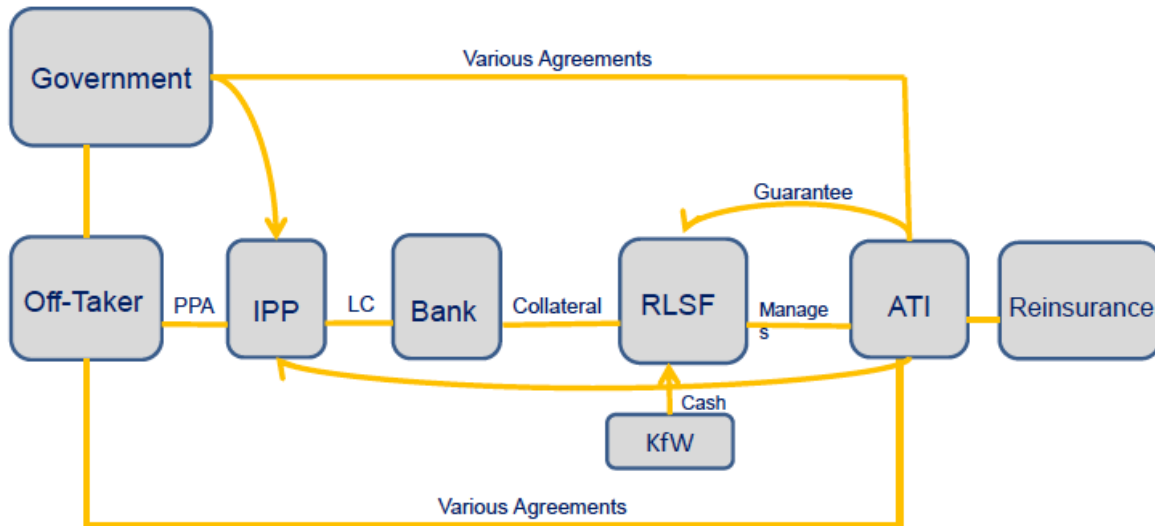


Figure 4: RLSF guarantee mechanism

The RLSF is managed by the African Trade Insurance Agency (ATI) which is an A-rated multilateral credit and political risk insurer based in Nairobi. Its function is to facilitate investments and trade in the African region especially for its 14 member states³⁵. ATI has preferred creditor status in its member countries and has signed MoU's with ZESCO as well as Zambia's Ministries of Energy and Finance. RLSF cover is only provided once ATI's investment committee has assessed projects as well. The RLSF is set to be rolled out to more countries in the region, including Burundi, Benin and Uganda (all of which have signed MoUs) and possibly also Ethiopia, Malawi and Madagascar.

ATI also developed a Transparency Tool that is aimed at increasing trust in and creditworthiness of off-takers in the African region. The tool is an online, public platform where IPPs report utility payment behaviour. This is to provide a transparent, accessible baseline platform that might mitigate lender bias when it comes to lending to African utilities. At the time of completing the report, the tool was still to be implemented.

³⁵ Benin, Burundi, Cote d'Ivoire, DRC, Ethiopia, Kenya, Madagascar, Malawi, Rwanda, South Sudan, Tanzania, Uganda, Zambia, Zimbabwe.

4 Running the auction: the key role-players

The institutional setting is a basic but often neglected element of an auction programme that plays a crucial role in determining outcomes. For an auction to deliver projects at low prices it needs to be implemented by a credible, capable and well-resourced authorised agency in a way that is seen as fair, transparent and consistent. Potential bidders need to trust both the auctioneer and the auction process to be willing to incur the costs of bidding. Furthermore the implementing organisation plays a crucial role in bringing awarded projects to commercial operation. To be effective at both establishing and maintaining bidder trust, as well as supporting project implementation, a careful matching of existing institutional resources with the needs of bidders is required. If the institutional resource pool is found to be lacking, it is to be augmented in such a way that it does not disrupt or diminish existing resource flows.

The two auction programmes employed different strategies to deal with the Zambian institutional setting – both building on and supplementing existing institutional resources. These strategies resulted in very different working arrangements with the Zambian institutions. The Scaling Solar model required the host country to hire IFC as the transaction advisor. In Zambia, the Ministry of Energy – the obvious choice for running such a programme – did not have the funds and capacity to conclude such a contract. Zambia’s Industrial Development Corporation (IDC), which is an investment holding company for the Zambian state-owned enterprises, was chosen as the best alternative. It was seen as a small (20 personnel³⁶), nimble and politically-supported procurement focal point with sufficient institutional capacity and resources to drive the programme.

Scaling Solar was led and implemented by the IDC, with the IFC playing an intensive but fundamentally supporting role as transaction advisor. While the World Bank Group, and the IFC in particular, featured prominently as the institutional partner behind the Scaling Solar programme, their involvement with the day-to-day procurement and project implementation activities was conducted at an arm’s length. It was the IDC that convened a procurement committee that conducted the bid evaluations, with the IFC available to the committee for support and clarification. The IDC also played a role in the design of the procurement process, leading to the inclusion of the special 1,5 financial prequalification multiplier that was applied to local Zambian companies.

The Zambian government’s (including the IDC’s) lack of experience with project-financed renewable energy projects has been highlighted as one reason for the delay in project implementation. The IFC’s advisory role did not officially extend beyond the procurement process, although the involvement of the IFC finance maintained a link to the projects. The IFC’s reduced role post-procurement meant that there was no dedicated advisory support to the Zambian government during the crucial stages leading up to financial close. While the IFC had six staff members working on Scaling Solar’s first procurement round (plus technical, E&S, legal, tax and accounting consultants), none of them were permanently based in Zambia. This lack of a neutral third party that could act as an honest broker between the Zambian government and the projects made it more difficult for both parties to navigate the complicated project implementation processes.

GET FiT followed a different approach, opting to embed its role to such a degree that the distinction between it and the Zambian government was essentially erased. GET FiT first secured €31 million grant funding from the German government to cover transaction advisory services. This opened up the possibility for establishing a partnership between KfW and the

³⁶ The IDC has since grown to about 75 people in 2019.

Ministry of Energy. The Ministry of Energy, as the project executing agency, subsequently authorised KfW by way of an agency contract with delegated authority. This meant that KfW was legally authorised to make binding statements and commitments on behalf of the Zambian government, to represent the Ministry of Energy and to implement procurement rounds. The Ministry however remained deeply involved in the strategic decisions and daily operations of the programme.

The GET FiT secretariat (staffed by KfW-funded consultants and Multiconsult Norge ASA) fulfilled the equivalent roles of both the IDC and IFC, not only designing, leading, and implementing the procurement programme, but also providing and contracting the necessary advisory services. This included KPMG as tax advisors to provide a detailed schedule of baseline taxes to bidders – a solution to the lesson carried over from GET FiT Uganda’s experience with tax-based project implementation delays. The secretariat’s mandate also extended beyond the procurement process to include the day-to-day management of the programme, supervision of the GET FiT projects (including support to achieve financial close and construction supervision to ensure compliance), management of the grid integration programme, capacity development of the Ministry of Energy, and co-ordination with Africa Trade Insurance and the Regional Liquidity Support Facility.

The GET FiT institutional governance (Figure 5) setup also included a steering committee tasked with advising on the overall programme’s strategy and an investment committee responsible for reviewing tender submissions and making ultimate investment decisions. The GET FiT steering committee comprised two categories of participants: voting participants, including representatives from the Ministry of Energy (chair), Ministry of Finance, ERB and co-operating partners (German government); and non-voting participants, including the GET FiT secretariat and KfW. The investment committee was made up of independent experts that were mostly from Zambia and served in their individual capacity (**Error! Reference source not found.**). While this governance setup is broadly similar to that used in the Ugandan GET FiT programme, the Zambian version also included a task force including representatives from ZESCO, ZEMA, WARMA, ERB, MoF, MoE (OPPPI, DOE), ZPPA, Ministry of Justice, and NHHC. This broad Zambian government stakeholder consultation group provided inputs and guidance on the programme generally and the procurement programme design and setup specifically.

GET FiT projects also benefitted from the pioneering work done by the Scaling Solar projects. For example the Zambian grid code is not compatible with solar PV. As a result each project needed to present and defend each required exemption to the grid code to the ERB’s technical committee³⁷. This was a time-consuming process which introduced an additional element of risk to the Scaling Solar programme and was also responsible for much of the project implementation delays. The GET FiT projects would now be able to benefit from an expedited process based on the technical committee’s previous decisions for the Scaling Solar projects³⁸. Similar path clearing work has been done by Scaling Solar in numerous other areas including risk allocation decisions on solar PV with ZESCO and should ultimately benefit the GET FiT projects and the market in general.

³⁷ GET FiT sought to secure eight grid code exemptions prior to the bidding window opening. ERB rejected two exemptions, which were appealed to the MoE. There was no final decision at date of bidding. Bidders were to assume that all exemptions were granted. One of the rejected exemptions was the redundant line (n-1) requirement. The motivation from the programme was that this required upgrading of substations too, and that the plants are too small. This was also rejected in Scaling Solar Round 1.

³⁸ The decisions by the technical committee are project specific, so no blanket exemption can be given from Grid Code requirements.

While the Scaling Solar programme was initiated in the throes of daily loadshedding and therefore marked by the need for rapid results, GET FiT was able to take a more measured approach. GET FiT’s approach to the development of the project documentation is a good example of this. The project documentation (PPA, Implementation Agreement, Connection Agreement, Direct Agreements, Liquidity Support and principal permits) was developed and negotiated over a two year period by a specialist international legal firm (Trinity LLP) with notable regional experience. Two development finance institutions also initiated early bankability reviews of the documents through their own legal advisors and the documents were subsequently also tested with (commercial) lenders prior to the bidding programme being launched. By the time that these documents were introduced to the market, they had therefore been thoroughly tested and adjusted for the Zambian context.

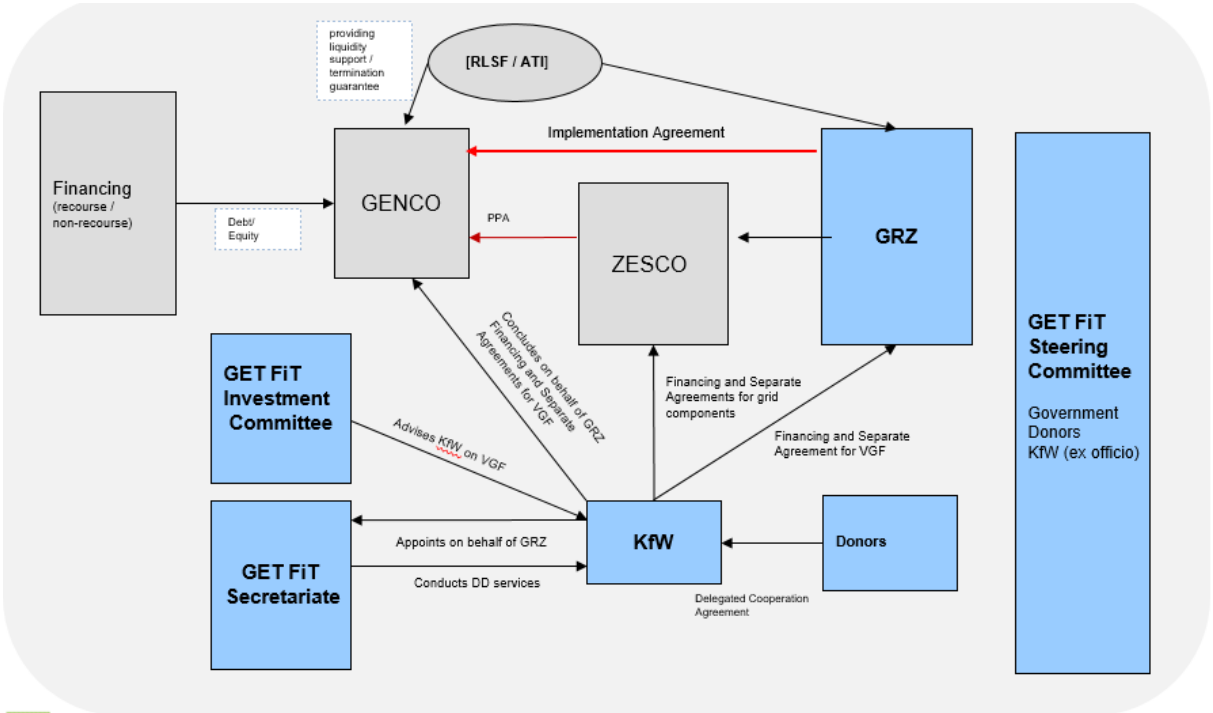


Figure 5: GET FiT Zambia institutional set-up

A key and oft-discussed institutional aspect of both programmes, and one which arguably had the biggest impact on the pricing outcomes, is the prominent role played by development partners in both programmes. We have seen support provided to auctions by external agencies in countries like South Africa and Malawi, but the prominence of the World Bank Group (Scaling Solar) and KfW (GET FiT) in Zambia led many bidders to treat these programmes not as Zambian auctions, but World Bank or KfW tenders. While bidders might not have been that familiar with the Zambian context, they knew the development partners, were aware of the direct roles they were playing and appeared to have been willing to price their risk based on the presence and reputation (and of course risk mitigation measures) of these institutions. Equity returns were for example reportedly in the 9-10% range for winning bids, which is considerably lower than the normally expected 15%.

5 Auction outcomes

Securing equity providers

The Scaling Solar projects were awarded to two (or three) of the largest global renewable energy companies at highly competitive prices (Table 10). The West Lunga site project went to the Neoen/First Solar consortium at a non-indexed price of US\$6,015/kWh while the Mosi-oa Tunya site was awarded to ENEL Green Power (US\$7,83/kWh). Neoen is one of the biggest French renewable energy developers with more than 2,8 GW of capacity (including a 300 MW PV plant in France), in operation or under construction in 13 countries (most of this – 1GW+ in Australia). First Solar was founded in 1990 and is the second largest manufacturer of solar PV modules globally. The American company forms part of the US State Department’s Power Africa programme and is a dominant global industry player. ENEL Green Power is a subsidiary of Italy’s power utility ENEL and the most successful renewable energy project developer in global auctions, with 1200 plants in operation and more than 43 GW under management. The company entered the African market through its participation in South Africa’s REIPPP programme, where it came to dominate the market during the later rounds of procurement. Apart from the abovementioned shareholders, the IDC also retained a minority (20%) stake in each project at full cost (Table 11).

Table 10: Scaling Solar bid prices

	West lunga Site	Mosi-oa Tunya Site
Neoen / First Solar	6.0150	6.1350
ENEL Green Power	7.7989	7.8390
Access / EREN Zambia 1	8.2879	8.9509
MULILO Zambia PV1 Consortium	8.4000	8.4000
EDF Energies Nouvelles	10.0400	9.9850
SEP / AVIC Intl	10.6000	10.6000

Table 11: Shareholding of Scaling Solar projects

Bangweulu Power Company Limited	Ngonye Power Company Limited
Neoen – 67%	ENEL Green Power – 80%
First Solar – 13%	IDC – 20%
IDC – 20%	

The project implementation phase of the Scaling Solar programme has not been marked by the same speed and efficiency as the procurement stages. Neoen/First Solar’s Bangweulu Power Company Limited (US\$60 million) was incorporated on 6 November 2016 when the shareholders agreement was signed between the three parties, about five months after the award was announced. Financial close was originally foreseen for March 2017, but with a presidential election in November 2016 and this being Zambia’s first project financed deal, it was only achieved in December 2017. This was very different from Scaling Solar’s original timeline, which included an eight month construction period that would have seen the project reach commercial operation in November 2017 already. Commercial operation commenced in March 2019. ENEL’s Ngonye project (US\$45 million) PPA was signed only in April 2017 and financial documents in June 2018 (although there had been no drawdown of funds prior to COD some conditions precedent were still outstanding). It reached commercial operation in April 2019.

The shareholder profiles of the awarded GET FiT solar PV projects look somewhat different from the Scaling Solar programme (Table 12), even though several of the same firms prequalified (Table 4). Some of the winning firms could be described as second-tier developers, many only recently expanding beyond their domestic markets. Building Energy is an Italian developer that first entered the African market through South Africa’s REIPPP programme. It was also awarded one of the GET FiT Uganda solar PV projects in 2014 (10 MW). While a global player, it is not a company with the same presence or track record as ENEL or Neoen, with about 160 MW in operation – most of this (91 MW) in Africa. Pele Energy – a minority shareholder in the projects – is a South African project developer involved in eight of the country’s RE IPP projects. This is the company’s first successful venture outside of South Africa’s market. Globeleq is Africa’s biggest IPP developer, with more than 1340 MW in operation, most of which is gas-based (846 MW). The company’s two shareholders are the Commonwealth Development Corporation (CDC) and Norfund with an explicit development mandate exclusively focused on sub-Saharan Africa. While active in South Africa’s REIPPPP (7 projects), the company also has operations in Ivory Coast, Cameroon, Tanzania and Kenya. Aurora Power Solutions is a South African developer and EPC company that has mainly been active in developing solar PV for the commercial and industrial sector in South Africa, Namibia and Mozambique (37,5 MW). It has also been one of the most successful bidders in South Africa’s Small IPP procurement programme, although none of these project have received a signed PPA. Innovent is a French developer with about 514 MW in operation, 140 MW of which is in Africa: Senegal, Benin, South Africa and Namibia. The inclusion of the Copperbelt Energy Company (CEC) in the list of winners is a notable result for the programme, being the only Zambian shareholder in both Scaling Solar and GET FiT (apart from the IDC’s mandated minority shares). CEC’s presence shows that the GET FiT qualification and evaluation criteria were effective in securing at least some degree of local participation and creates the foundation for further domestic market development.

Table 12: GET FiT Zambia solar project details

Projects	Bidders	Size	Price
Bulemu East & West	Building Energy & Pele Green Energy	2 x 20 MWac	US\$3,999/kWh
Aurora Sola One & Two	Globeleq & Aurora Power Solutions	2 x 20 MWac	US\$4,52/kWh
Garneton North & South	Innovent & CEC	2 x 20 MWac	US\$4,80/kWh

Much has been said about the tariff levels already, but it is again worth noting that at the time of their announcement, these were the lowest solar PV tariffs in Africa. The programme had originally proposed to the Zambian government that if tariffs were above US\$10/kWh, GET FiT would cover the residual; between US\$7 and 10, GET FiT would provide a maximum top-up of US\$1/kWh and below US\$7/kWh would see no top-up being provided. What makes the submitted tariffs even more notable is that unlike Scaling Solar, these were smaller projects (assuming pricing on a 2 x 20 MW basis, and not 1 x 40 MW) that had to find and secure their own sites, without stapled IFC financing and facing an increasingly risky investment environment and off-taker. It is also notable that apart from one bid, all submitted bid tariffs were below US\$5/kWh.

Securing debt providers

In both programmes the debt pool has been dominated by DFI’s and other sources of concessionary finance. In Scaling Solar the IFC offered one tranche of debt financing on what it considered commercial terms, and another tranche on concessional terms (LIBOR +0 at 20 year tenor) based on available grant funding from the Canada Climate Change programme. A

third tranche of financing needed to be sourced by bidders from other financiers, whether commercial banks, or export credit agencies. The reasoning behind offering stapled finance was in large part an attempt to strengthen the non-negotiable, bankable nature of the contracts offered³⁹. The Neoen/First Solar project secured its third tranche of debt (US\$19,9 million) from OPIC (US export credit agency) which matched the blended average of the IFC and climate change loan interest rates. The ENEL project secured financing from the European Investment Bank (EIB) at a very high (75/25) gearing ratio. One thing to note is that ENEL was not able to use this debt funding prior to COD due to some outstanding conditions precedent. Nonetheless the project reached commercial operation in April 2019, suggesting that the company corporate financed the development of the plant in an effort to avoid further delays.

Table 13: Scaling Solar project debt providers

	Bangweulu Power Company Limited	Ngonye Power Company Limited
IFC A Loan	US\$ 12 million	US\$ 22 million
IFC-Canada Climate Change Programme Concessional Senior Loan		
Parallel Senior Loan	OPIC – 19,9 million	EIB – 11,75 million

There has been a lot of criticism of the IFC’s approach, with some critics claiming that it is crowding out commercial financiers while others noted that the concessional debt created unrealistic market expectations (Elston, 2016; Dunlop, 2017). IFC estimates that the combination of concessional elements in the programme (low equity return expectations, concessional debt, full PRG cover, no interconnection costs, low development costs, Zambian tax incentives) probably shaved about US\$2/kWh off the bid tariffs. This is a significant amount and seems to support the critics’ assertions.

The GET FiT results are a powerful counterpoint to many of these critical arguments. These bidders were able to achieve much lower prices, on smaller projects, without most of the concessional elements mentioned. Nonetheless the debt for all of the winning projects is being provided by development finance institutions, possibly on quite concessionary terms. This means that the entire utility-scale solar PV sector in Zambia’s debt is coming from DFI’s, leaving no scope for local or regional commercial finance providers.

Technical performance and strategic management

For the Scaling Solar projects to eventually have reached commercial operation in early 2019 required extensive and sustained effort from the winning bidders, not only in terms of managing the technical building process, but also from a strategic management point of view. This was partly why Neoen established a Zambian country office, arguing that having a permanent local presence helped them to develop the strategic relationships and know-how in-country to bring their West Lunga project (52 hectares, 460,000 thin film modules, 12 transformers) to commercial operation. Despite there having been substantial site-related issues, ENEL managed their Ngonye project (50,2 hectares, 105,000 tracker modules, 28 inverters) from the company’s South African regional office and brought it online only a month after the Neoen

³⁹ Internal IFC sensitivity analyses seem to indicate a price impact of less than US\$10/MWh due to concessional elements in the financing, indicating a limited impact on the market.

project. Managing issues related to the project sites, licensing frameworks and connection agreements in particular required day-to-day involvement from the winning bidders.

Although the project prices played an important part in securing strategic support from the Zambian government, projects also needed to ensure that the local communities around their projects granted them (and continued to grant them) a social license to operate. Despite using international EPC contractors (Sterling & Wilson for West Lunga; TerniEnergua for Ngonye), projects also made use of as much local labour as possible during the construction and operations phases. For example The West Lunga project employed more than 200 workers during construction, mostly from neighbouring communities. In addition it employed seven full-time technical operations staff, as well as 37 unskilled personnel for security, cleaning and groundskeeping. The aforementioned local community investment programmes played a further important role in securing and maintaining support for the projects' ongoing operation.

The GET FiT programme was more explicit in its ambition of embedding the programme in the Zambian context. The secretariat and supporting governance structures functioned as a strategic management hub for the programme and its projects, with key institutions forming part of formal and less formal decision-making and consultative structures. The secretariat for example took over some of the roles fulfilled by the projects in the Scaling Solar programme, such as leading the grid code exemption process on behalf of all awarded projects. The programme also sought to strengthen local and regional legal institutions by ensuring that GET FiT Zambia was governed by Zambian law (as opposed to German law, which was the case in Uganda) and making the site of arbitration for disputes Johannesburg⁴⁰. The bidding documents also required bidders to maximise the utilisation of Zambian manufacturers, contractors, suppliers and other service providers.

⁴⁰ The RfQ documents still maintained an arbitration clause that would see the rules of conciliation and arbitration of the international chamber of commerce in Paris being used, and the site of arbitration procedures being Frankfurt.

6 Learning from Zambia

What contributes to the success of IPPs in Africa and other developing regions? Previous literature and case studies have shown that a combination of country- and project-level factors explain project outcomes in a variety of settings (Eberhard and Gratwick, 2005, 2011; Woodhouse, 2005a, 2005b; Malgas, Nawaal Gratwick and Eberhard, 2007; Eberhard and K. Gratwick, 2013; Eberhard and K. N. Gratwick, 2013; Eberhard et al., 2017; Meyer, Eberhard and Gratwick, 2018). Zambia is no different. At a country level, Zambia represents a difficult investment climate, compounded by a utility that is not creditworthy and has been in default on payments to IPPs. Still, there is a broad policy, legislative and regulatory framework for private investment, and an independent regulator. Historically, this has not led to a flood of investment, in part also due to the ineffectiveness of OPPI, poor planning, and little experience in running competitive procurements. Here, the Scaling Solar and GET FiT programmes have broken new ground. At a project level these programmes have attracted experienced debt and equity providers; created bankable project documents – including Implementation Agreements and Power Purchase Agreements (PPAs) with reasonable risk allocation; and been backed by strong credit enhancement, security, and risk mitigation measures. But key to these programmes' achievements have been programme design innovations and support for running effective auctions, which have resulted in surprisingly good outcomes. Zambian bids have broken African solar PV price records twice in the past three years, and despite setbacks and delays, the Scaling Solar projects reached COD within a reasonable amount of time. GET FiT projects only need to reach financial close in 2020, but there are early signs that this might be a challenge.

The involvement of international institutions and their advisors – World Bank/IFC advisory, in the case of Scaling Solar, and KfW/Multiconsult, in the case of GET FiT – was crucial to earning and sustaining the market's trust in the bidding programmes, especially in the face of implementation challenges. Both programmes also went to great lengths to embed the auction programmes in local institutions – arguably more so in the case of GET FiT, which set up steering and investment committees as well as a programme secretariat.

In terms of auction design, the Scaling Solar and GET FiT programmes were run along broadly similar lines. Both programmes were set up as two-stage, sealed-bid, pay-as-bid tenders that prioritised project price (exclusively so in the case of Scaling Solar) in the bid scoring process. Financial and physical qualification criteria were substantial, project documents were non-negotiable and penalty regimes robust. The GET FiT programme additionally allowed bidders to submit conditional bids to combine both project sites, explicitly screened bids based on grid impacts and included a clause that would see project prices reduced commensurate with PV cost trends if financial close was significantly delayed.

Both programmes have also attracted their share of criticism. The selection and preparation of the project sites was a key (but eventually resolved) challenge for the Scaling Solar projects, and lessons appear to have been learned. Local and international commercial lenders have also complained about being crowded out by DFIs and export credit agencies. There are likewise questions being asked about the sufficiency of the risk mitigation package offered to GET FiT projects in light of deepening financial troubles of ZESCO and the Zambian state.

Still, the Zambian auction programmes offer powerful lessons on auction design and implementation for the region. It foregrounds the importance of trust, underpinned by institutional capacity, communication and transparency. It shows that simple yet innovative auction design, coupled with effective risk mitigation measures, can deliver incredible results. Finally, Scaling Solar and GET FiT are learning iterative lessons across countries which have the potential to benefit further countries in the future.

Appendix A

Analytical framework

The analytical framework used represents a widening and deepening of the work done by Eberhard and Gratwick (2011) and Eberhard et al. (2017) in their analyses of factors contributing to the success of IPPs in sub-Saharan Africa. These authors have identified a host of factors, at both country and project level, that influence the success of these projects. In particular, they have emphasised the importance of competitive procurement (Eberhard et al., 2016) without explicitly making recommendations concerning the design and implementation of such procurement programmes – largely because the most of sub-Saharan Africa’s IPP capacity has been procured through direct negotiations, often initiated by unsolicited proposals (Eberhard et al., 2016).

How procurement interactions between the public and private sectors need to be structured and managed is a key concern for the development of successful new renewable generation capacity in this region. Renewable energy auction design is a field of growing scholarly and practitioner interest. The work of, for example, Del Río and Linares (2014); Lucas, Ferroukhi and Hawila (2013); Kreiss, et al., (2016); Del Río (2017); Lucas, Del Rio and Sokona (2017); Dobrotkova, et al.(2018); Hochberg and Poudineh (2018); and Kruger and Eberhard (2018) offers a useful body of literature for developing a deeper understanding of how choices made in the design of procurement programmes can influence price, investment outcomes, and so on. Eberhard and Naude (2016) as well as Eberhard, Kolker and Leigland (2014) have also emphasised how choices made around procurement programme implementation can play a role in determining outcomes.

The analytical framework used in this case study attempts to combine lessons from the literature on IPP success factors with studies of auction design and implementation to offer a detailed and nuanced understanding of various factors that influenced the auction outcomes. Factors investigated and assessed in the study are outlined in the table below.

Table 14: IPP success factors

Factors	Details
Country level	
Stability of economic and legal context	Stability of macroeconomic policies Extent to which the legal system allows contracts to be enforced, laws to be upheld, and arbitration to be fair Repayment record and investment rating Previous experience with private investment
Energy policy framework	Framework enshrined in legislation Framework clearly specifies market structure and roles and terms for private and public sector investments (generally for a single-buyer model, since wholesale competition is not yet seen in the African context) Reform-minded ‘champions’ to lead and implement framework with a long-term view
Regulatory transparency, consistency and fairness	Transparent and predictable licensing and tariff framework Cost-reflective tariffs Consumers protected

Coherent sectoral planning	Power-planning roles and functions clear and allocated Planners skilled, resourced, and empowered Fair allocation of new-build opportunities between utilities and IPPs Built-in contingencies to avoid emergency power plants and blackouts
Competitive bidding practices	Planning linked to timely initiation of competitive tenders/auctions Competitive procurement processes are adequately resourced, fair and transparent
Programme level	
Programme design	Bidder participation is limited to serious, capable and committed companies Contracts are bankable and non-negotiable Balance between price (competition) and investment risks/outcomes is appropriate Programme is linked to and informed by planning frameworks (volume, transmission etc.) Investment risks and costs are allocated fairly Design takes local political and socio-economic context into consideration Transaction costs (bidders and procuring entity) offset by price and investment outcomes Qualification and evaluation criteria are transparent and quantifiable Design allows for multiple scheduled procurement rounds Measures to create local capacity/market are built in through local currency PPA, shareholding requirements, etc.
Programme implementation	Both the programme and the procuring entity have appropriate and unbiased political support, as well as an appropriate institutional setting and governance structures The procuring entity is capable, resourced and respected Co-ordination between various government entities is effective The procurement process is clear, transparent and predictable
Project level	
Favourable equity partners	Local capital/partner contributions are encouraged Partners have experience with and an appetite for project risk A DFI partner (and/or host country government) is involved Firms are development minded and ROEs are fair and reasonable
Favourable debt arrangements	Competitive financing Local capital/markets mitigate foreign-exchange risk Risk premium demanded by financiers or capped by off-taker matches country/project risk Some flexibility in terms and conditions (possible refinancing)
Creditworthy off-taker	Adequate managerial capacity Efficient operational practices Low technical losses Commercially sound metering, billing, and collection Sound customer service
Secure and adequate revenue stream	Robust PPA (stipulates capacity and payment as well as dispatch, fuel metering, interconnection, insurance, <i>force majeure</i> , transfer, termination, change-of-law provisions, refinancing arrangements, dispute resolution, and so on). Security arrangements are in place where necessary (including escrow accounts, letters of credit, standby debt facilities, hedging and other derivative instruments, committed public budget and/or taxes/levies, targeted subsidies and output-based aid, hard currency contracts, indexation in contracts)
Credit enhancements and other risk management and mitigation measures	Sovereign guarantees Political risk insurance Partial risk guarantees International arbitration
Positive technical performance	Efficient technical performance high (including availability) Sponsors anticipate potential conflicts (especially related to O&M and budgeting) and mitigate them

Strategic management and relationship building	Sponsors work to create a good image in the country through political relationships, development funds, effective communications, and strategically managing their contracts, particularly in the face of exogenous shocks and other stresses
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Source: Adapted from Eberhard et al. (2016)

Appendix B: Classification: ZESCO substations - grid connection of PV plant

PV Maximum Size Connection Categories:
A = 20 MW / B = 10 MW / B+ = 10 MW with 5 MVar Reactor / C = Not Available

Region	Substation	Category	Maximum PV Size	Trf Voltage (kV)	Trf Size (MVA)
Eastern	Msoro	A	20 MW	330/66	2 x 45
	Azele	B	10 MW	66/33	2 x 25
	Mfuwe	B	10 MW	66/11	2.5
	Chipata	A	20 MW	132/33	2 x 45
Western	Sesheke	A	20 MW	66/11	10
	Senanga	B+	10 MW	66/11	1 x 5; 1 x 2.5
	Mongu	C	N/A	66/11	2 x 10
	Kalabo	C	N/A	11/0.4	1
	Kaoma	C	N/A	66/33; 66/11	1 x 5; 1 x 2.5
Northern	Kasama	A	20 MW	330/66	2 x 65
	Mbala	A	20 MW	66/33	10
	Luwingu	B	10 MW	66/11	5
	Mporokoso	C	N/A	66/11	2.5
	Mpika	A	20 MW	330/66	2 x 90
	Chinsali	B+	10 MW	66/11	5
	Isoka	B+	10 MW	66/11	5
	Nakonde	B+	10 MW	66/11	10
	Mansa	B	10 MW	66/33	10
	Kawambwa	B	10 MW	66/11	5
North Western	Lumwana	A	20 MW	330/132	2 x 90
	Mfumbwe	A	20 MW	132/33/11	1 x 10
	Kabompo	B	10 MW	132/33/11	2 x 25
	Mumbezhi	B+	10 MW	132/33	1 x 5
	Mwinilunga	B	10 MW	132/33/11	1 x 25

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