



Graduate School
of **BUSINESS**
UNIVERSITY OF CAPE TOWN



Energy and Economic Growth
Applied Research Programme



Ethiopia Country Report

Report 5: Energy and Economic Growth Research Programme
(W01 and W05) *PO Number: PO00022908*

December 2019

Wikus Kruger, Fezeka Stuurman and Olakunle Alao

Power Futures Lab



To find out more about our world-class academic programmes, executive education short courses and customised programme offerings contact 0860 UCT GSB (828 472) | INTL +27 (0)21 4061922 | info@gsb.uct.ac.za or visit www.gsb.uct.ac.za

Contents

- List of figures and tables** **3**
 - Figures 3
 - Tables 3
- Frequently used acronyms and abbreviations** **4**
- 1 Introduction** **5**
- 2 Country overview** **6**
 - Ethiopia’s power sector 7
 - Private power investment in Ethiopia..... 12
- 3 Renewable energy auctions** **15**
 - Auction demand 16
 - Site selection 16
 - Qualification and compliance requirements..... 18
 - Qualification criteria 20
 - Bidder ranking and winner selection 22
 - Seller and buyer liabilities 24
 - Securing the revenue stream and addressing off-taker risk 25
- 4 Running the auction: the key role-players** **27**
- 5 Auction outcomes** **30**
- 6 Learning from Ethiopia** **33**
- Appendix A** **35**
 - Analytical framework 35
- Appendix B** **38**
 - Participating tenderers: Metehara Solar PV 38
 - Participating tenderers: Scaling Solar I 38
 - Prequalified tenderers: Scaling Solar II 38
- References** **39**

List of figures and tables

Figures

Figure 1: Installed electricity generation capacity: Ethiopia 1998–2019 7
Figure 2: Ethiopia’s Electricity Market Structure 9
Figure 3: Global Horizontal Irradiance levels for Metehara and Scaling Solar I & II projects 18
Figure 4: Shareholding structure of the Metehara Solar PV project..... 31

Tables

Table 1: Key institutions in Ethiopia’s electricity sector 9
Table 2: List of power plants in Ethiopia 10
Table 3: List of Ethiopia’s IPP Pipeline projects (excluding planned projects) 13
Table 4: Prequalified bidders for Metehara and Scaling Solar 1 19
Table 5: Timelines for the bidding processes 19
Table 6: Bid scoring criteria 23
Table 7: Breakdown of the technical and commercial scoring criteria 23
Table 8: Proposed tariff by prequalified companies for Metehara Solar PV 30

Frequently used acronyms and abbreviations

BOO	Build-Own-Operate
BOOT	Build-Own-Operate-Transfer
COD	Commercial operation date
CRGE	Climate Resilient Green Economy
DFI	Development finance institution
DN	Directly negotiated
EEA	Ethiopian Energy Authority (previously Ethiopian Electric Authority)
EEP	Ethiopian Electric Power
EEU	Ethiopian Electric Utility
EGP	ENEL Green Power
EPC	Engineering, procurement, and construction
ESIA	Environmental and social impact assessment
ETB	Ethiopian Birr
GDP	Gross Domestic Product
GERD	Grand Ethiopian Renaissance Dam
GoE	Government of Ethiopia
GTP	Growth Transformation Plan
IDA	International Development Association
IFC	International Finance Corporation
IPP	Independent power producer
MoWIE	Ministry of Water, Irrigation, and Electricity
MPA	Multi-phased programmatic approach
O&M	Operations and maintenance
PPA	Power purchase agreement
PPP	Public private partnership
PV	Photovoltaic
REGREP	Renewable Energy Guarantees Program
RfP	Request for proposal
RfQ	Request for qualification
US\$	United States dollar

1 Introduction

Ethiopia's renewable energy auction programmes have the potential to become regional best practice. The country has managed to twice secure the lowest solar PV project prices in sub-Saharan Africa through its procurement programmes. It did so in 2016, when the Ethiopian utility, Ethiopian Electric Power (EEP), awarded the tender for the 100 MW Metehara project to ENEL Green Power at US\$ 5,85/kWh; and it did so again in 2019, when the tender for the first two 125 MW Scaling Solar¹ projects was awarded to ACWA Power at the extraordinary tariff of US\$ 2,53/kWh.

These bidder commitments still need to be financed and built for the country to realise this potential. While it is still too early to say whether the ACWA Power projects will reach financial close on time, the experience of the country's pioneer independent power producers (IPPs) shows that this will be no small feat. At the time of compiling this report, none of Ethiopia's awarded IPPs – including the Corbetti and Tulu Moye geothermal plants, which were the first projects to sign power purchase agreements (PPAs) with EEP in 2015 – have reached financial close.

How Ethiopia managed to secure the solar PV project tariffs, why it has so far struggled to secure existing investments, and how future auction rounds can be improved will form the key questions guiding this analysis. The report will consider the contributing elements of success for IPPs at the country, project, and programme levels. It will, in particular, provide evidence of the importance of project site selection and preparation; risk allocation, mitigation and credit enhancement; the link between dynamic, least-cost planning and procurement; and the centrality of institutions for securing IPP investments at affordable prices.

The report is structured as follows: the introduction provides an overview of recent economic and political developments which is followed by a discussion of the Ethiopian power sector. Subsequent sections will analyse the design and implementation of the Metehara and Scaling Solar procurement programmes, including project site selection, auction volume, qualification criteria, evaluation criteria, equity and debt providers, key role players, and risk mitigation and credit enhancement measures. The report concludes with a discussion of possible lessons to be learned from Ethiopia's renewable energy auction programmes.

¹ According to the International Finance Corporation (IFC), the transaction is no longer a Scaling Solar transaction. IFC will continue to advise the Government of Ethiopia (GoE) in its efforts to attract private sector investment to its solar program in a fair and transparent manner.

2 Country overview

The Republic of Ethiopia is an exceptional African nation state. Sharing borders with Eritrea, Somalia, Kenya, South Sudan, and Sudan, it is the oldest independent nation in Africa, with its only period of colonial rule being a short occupation by Italy from 1935-1941. With a population of more than 105 million it is the most populous landlocked nation in the world and Africa's second most populous country. It is also regarded as Africa's fastest growing economy, with an average annual GDP growth rate of 10.3% between 2006/07 to 2016/17 (World Bank Group, 2017). Despite Ethiopia's relatively poor ranking for political stability and peace, its large market size and high growth rate has enabled it to be ranked amongst the top-ten investment destinations in Africa (RMB, 2017). This strong growth is set to continue in the short- to medium-term, underpinned by the privatisation of key economic sectors (including electricity, transportation and telecommunications), expansion of the service sector, overall industrial growth, an increase in foreign direct investment and improved spending on public infrastructure (AfDB, 2019).

The country faces a number of serious economic and developmental challenges. Despite its burgeoning economy and very low Gini-coefficient, Ethiopia remains one of the poorest nations in Africa, even though the portion of the country's population facing extreme poverty has reduced from 46% to 25% between 1995 and 2016 (World Bank Group, 2017; AfDB, 2019). Its impressive economic growth has been almost entirely driven by public sector spending, to such a degree that it has the third highest public investment rate in the world – but also the sixth lowest rate of private investment. Most large companies are state-owned, and there is a level of political, economic, and business entanglement rarely seen outside socialist China (World Bank, 2016; Gordon, 2018). This not only has important balance of payment implications, but it also means that Ethiopia remains at high risk of external and public debt distress, given its high public debt-to-GDP ratio of 61.8% (2018) – most of which is held by China (World Bank Group, 2018a; AfDB, 2019).

Recent structural, political, and economic reforms are signalling the start of a new era for the country. It emerged from decades of repressive imperial and communist-era policies and devastating droughts in the early 2000s, only to be plunged back into civil unrest until October 2016 when a nine-month long state of emergency was declared. In March 2018 the reform-minded Abiy Ahmed became the new prime minister following the resignation of Halemariam Desalegn. Ahmed immediately initiated a number of key reforms, including the signing of a peace treaty with neighbouring Eritrea that ended decades of conflict and for which he was awarded the 2019 Nobel Peace Prize. He also called for general elections to be held in 2020, initiated the privatisation of key economic sectors (despite fierce local opposition) and appointed reform-minded executives to key positions in government (Badwaza, 2018; Gordon, 2018; HRW, 2018; Mills, 2018).

For a country that has long followed China's model of economic growth and governance – with substantial support from China to realise this ambition (Gordon, 2018; Fox, 2019) – the disruption caused by these reforms cannot be easily overstated. The Ethiopian economy has been state-led for most of modern history, with very limited private sector participation. By opening up major economic sectors to the private sector, the Ahmed-regime is looking to attract much-needed foreign direct investment and reduce public debt. To facilitate this a number of important legislative and institutional changes are taking place, none more prominent than the promulgation of the Public Private Partnership Proclamation No. 1076/2018 (PPP Proclamation). The PPP Proclamation strengthens the position of the finance ministry by, *inter*

alia, establishing a PPP board chaired by the Ministry of Finance and Economic Cooperation (MOFEC) and setting up a PPP directorate general hosted by MOFEC. Not only does the PPP Proclamation commit the country to maintaining overall macroeconomic stability, but it also requires that any major investment decisions, including infrastructure, need to be approved by the newly established PPP board (FDRE, 2018; Gordon, 2018; World Bank Group, 2019). These requirements have introduced uncertainty and ambiguity into the normally highly hierarchical Ethiopian state decision-making system as new roles and powers are assigned and formalised, and old ideologies are confronted with new realities. The result has been a frenzy of poorly co-ordinated activity that has as yet failed to deliver notable private power sector investments, despite significant support by various development partners and multilateral institutions.

Ethiopia’s power sector

Introduction

Ethiopia’s power system is large compared to its regional neighbours, dominated by large hydroplants. The country has more than 4500 MW of installed generation capacity, of which 90% is hydropower-based. This makes the sector particularly vulnerable to drought, resulting in Ethiopia being ranked 118th out of 144 countries for the quality of electricity supply. The GoE has prioritised the diversification of the energy mix with other clean and renewable energy sources (geothermal, solar, and wind) to increase system resilience. Government has also prioritised rural electricity access, as only about 45% of the Ethiopian population has access to electricity, varying widely between urban (97%) and rural (31%) areas (Schwab, 2014; Norton Rose Fulbrigt, 2016; Beyene, 2018).

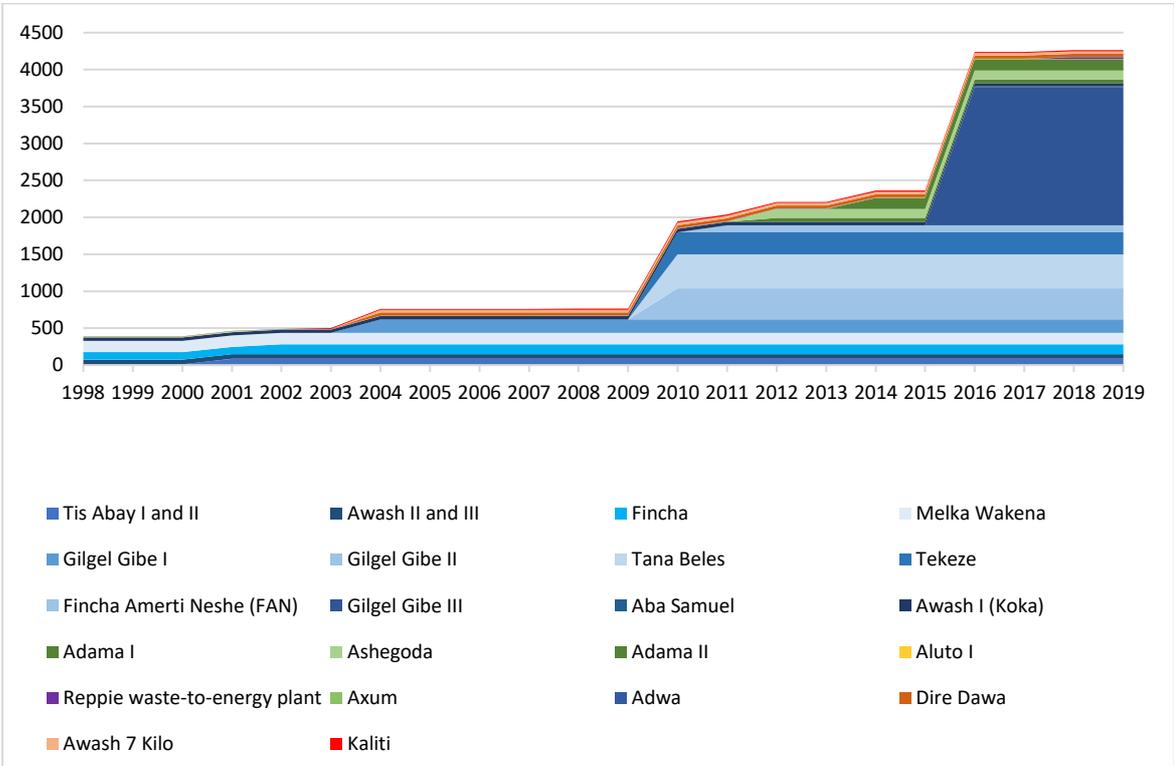


Figure 1: Installed electricity generation capacity: Ethiopia 1998–2019

Source: Authors’ calculation

Note: Blue = Hydropower. Green = Wind. Yellow = Geothermal. Purple = Biomass. Red = Diesel.

Although Ethiopia has increased its installed electricity generation capacity by more than tenfold over the past three decades, the peak demand still outstrips the supply, which is primarily driven by the country's substantial economic growth rate. Ethiopia plans to meet this shortfall by adding about 10 GW of hydro and 3 GW of other renewables by 2020 (IEA, 2017b). The most ambitious single project in service of this goal is the construction of the 6000 MW Grand Ethiopian Renaissance Dam (GERD) on the Blue Nile, financed mainly through government bonds and private donations. The GoE also has an ambitious target of reinforcing 63 existing substations, and building 114 new transmission substations and 13,540km of new transmission lines (500 kV to 66 kV), many of which are being supported by financial contributions from China and the World Bank (Norton Rose Fulbright, 2016; IEA, 2017a).

The Grand Ethiopian Renaissance Dam (GERD)

The GERD hydropower project epitomises Ethiopia's determination to achieve middle-income status by 2025.

The site of the Grand Ethiopian Renaissance Dam (GERD), located in the Benishangul-Gumuz region of Ethiopia was discovered in 1964 by the United States Bureau of Reclamation, during a Blue Nile River survey. Although the potential economic benefits of the plant was apparent, the ousting of the Haile Selassie-led regime by the Derg regime in 1974 left the project in limbo. In 2009, another survey was carried out on the site, and in 2010 the design of the dam was completed. The GoE, through the Ethiopian Electric Power Corporation (EEPCo), directly negotiated and consequently awarded the EPC contract to Salini Impregilo. Construction started in 2011 (Water Technology, 2014; Norton Rose Fulbright, 2016; Africa Energy, 2019; All Africa, 2019).

With a total project cost (excluding transmission lines cost) of \$4,8 billion, the project involves the construction of a major dam and two power stations. The potential downstream impact of the dam was always a major area of contention amongst nations in the Nile Basin Initiative (NBI). The GoE thus chose to provide most of the project's funding (63%) to avoid depending on funding from foreign finance institutions, who may be put under pressure to withdraw their support by NBI members opposed to the project. The remainder is financed by Chinese Banks (Water Technology, 2014; Norton Rose Fulbright, 2016; Africa Energy, 2019; All Africa, 2019).

The project has experienced many challenges (Water Technology, 2014; Norton Rose Fulbright, 2016; Africa Energy, 2019; All Africa, 2019). Egypt and Sudan – both situated downstream of the Blue Nile River – have opposed the project because of the potential impact on the water levels of the Blue Nile River. Egypt in particular sabotaged the early progress of the project. In 2012, Ethiopia, Egypt and Sudan signed a tri-partite treaty agreement to investigate the potential downstream impact of the project. The results were contested by both downstream countries. A newly proposed compensation package will allow both countries to receive a fraction of the installed capacity of the plant. The EPC – Salini Impregilo – recently also requested additional funds due to unanticipated costs. Payment delays have furthermore slowed progress. In addition, EEP terminated its electromechanical contract with the state-owned industrial enterprise, Metals & Engineering Corporation (Metec), due to concerns of corruption and poor performance.

China remains strongly involved in the project (Norton Rose Fulbright, 2016; Africa Energy, 2019; All Africa, 2019). The China Electric Power Equipment and Technology Company is building the transmission lines that will be used to evacuate power from the plant. Between 2018 and 2019, EEP also awarded contracts to China Gezhouba Group Company to undertake pre-commissioning tests and Voith Hydro Shanghai Ltd and PowerChina to aid in the repair of the poor-quality work that was previously done by Metec.

Box 1: The Grand Ethiopian Renaissance Dam

Power sector structure

Ethiopia's power sector remains dominated by the state. Established in 1956, the Ethiopian Electric Light and Power Authority (EELPA) was replaced in 1997 by the Ethiopian Electric Power Corporation (EEPCo) – responsible for generation, transmission and distribution – and the Ethiopia Electricity Agency (EEA) – responsible for regulating all electricity-related activities (Shanko, 2002). Following power sector reforms in 2013, Ethiopia vertically unbundled EEPCo into two independent state-owned entities (Figure 2): Ethiopian Electric Power (EEP) which covered generation and transmission activities and Ethiopian Electric Utility (EEU) which covered distribution (Perera, 2018). Ethiopia is the only sub-Saharan African country to have first separated distribution from generation and transmission (Eberhard *et al.*, 2019), for reasons which remain unclear. The Ethiopian Energy Authority (EEA) also

replaced the Ethiopian Electric Agency, with responsibility for overseeing tariff and rate setting of current generators and licensing² of new players (Perera, 2018). All three entities – EEP, EEU and EEA – report to the Ministry of Water, Irrigation and Electricity (MOWIE) (Table 1).

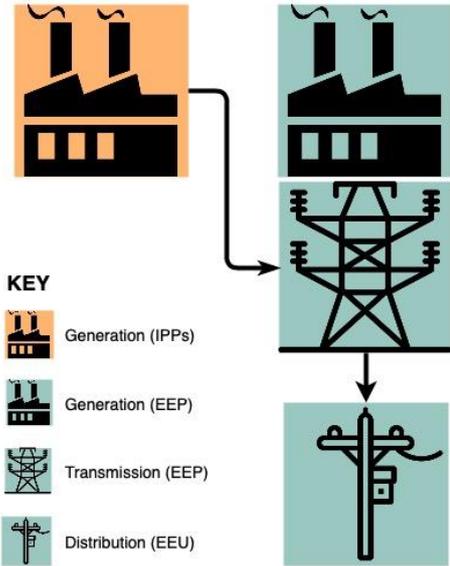


Figure 2: Ethiopia’s Electricity Market Structure

Source: AfDB, 2019

Table 1: Key institutions in Ethiopia’s electricity sector

Ministry of Water, Irrigation, and Electricity (MoWIE)	MoWIE is responsible for fostering the development of water and electricity resources in Ethiopia. It also manages the Rural Electrification Fund. The Ministry is led by a Minister and three State Ministers for the Water Supply and Sanitation Sector, Irrigation and Drainage Sector, and Electricity Sector.
Ethiopian Energy Authority (EEA)	The EEA is responsible for regulating the entire value chain of the electricity sector, including tariff and rate setting of current players, and licensing of new players.
Ethiopian Electric Utility (EEU)	The EEU owns, operates and maintains the electricity distribution infrastructure. It is also responsible for purchasing bulk power (capacity and energy) from EEP and distributing electricity to consumers.
Ethiopian Electric Power (EEP)	The EEP owns, operates and maintains most of the currently existing power plants and the transmission infrastructures in Ethiopia. It is also responsible for leasing transmission lines and selling bulk electric power. It is regarded as having high technical and non-technical efficiency in comparison with most of its African peers.

Source: Authors’ compilation

Tariff levels and financial sustainability

The Ethiopian electricity system’s heavy reliance on large-scale hydropower has helped it maintain sub-Saharan Africa’s lowest electricity retail tariff at US\$c 3/kWh (Power Africa, 2018). However, when current and past capital expenditures (including accumulated debt obligations) are taken into account, the utility effectively operates at a loss (Trimble *et al.*, 2016; World Bank Group, 2018b). EEP has borrowed heavily on local and international markets to finance its current generation and access expansion programmes, adding to the country’s significant debt burden. While international debt obligations have mostly been serviced on time, most local debt has continuously been rolled forward. In 2017, to be able to service this debt as

² Standard length of PPAs are 25 years: hydropower and geothermal, and 20 years: wind, solar, biomass and biogas.

well as cover the costs of new IPP generation capacity, a revised tariff setting methodology was designed to reflect the full cost of service. This tariff increase is set to be implemented in four phases between 2019 and 2022, resulting in a final tariff of around US\$ 7/kWh (World Bank Group, 2018b, 2019). EEP is also planning on refinancing some of the existing debt, increasing private sector investment and selling more power to Kenya³, Tanzania and Rwanda to deal with its cash flow and funding problems (Norton Rose Fulbright, 2016).

Regulatory and policy framework

Ethiopia's current regulatory regime is relatively sparse and weak, while the power system planning framework is overly ambitious and poorly implemented (Gordon, 2018). EEA generally scores poorly on regulatory operational and financial independence indices: it is fully reliant on budgetary allocation from government and there is strong evidence that its decisions are influenced by political authorities (Eberhard *et al.*, 2019). Ethiopia's generation expansion plans have also proved to be unrealistic. For example the Growth and Transformation Plan (GTP) of 2011-2015 sought to increase installed generation capacity by between 6-8 GW by 2015. By the end of 2015 only 500 MW had been added. GTP II (2016-2020) sought to expand capacity by more than 13 GW, mostly from hydro but also wind, geothermal, solar PV, and biomass sources (Gordon, 2018). At this stage it seems clear that Ethiopia will miss this target as well. This lack of progress undermines the usefulness of these 5-year government plans and reinforces the importance of using dynamic, rational, least-cost planning models that are translated into competitive procurement windows in a timely manner (Eberhard *et al.*, 2017).

Table 2: List of power plants in Ethiopia

Power plants	Location	Technology	Installed Capacity (MW)	Category	Commercial Operation Date (COD)
Aba Samuel ⁴	Akaki	Hydro, small (<50 MW)	6,6	Utility	1932 (6,6), 1974 (0), 2016 (6,6)
Tis Abay I and II	Amhara	Hydro, large	84,4	Utility	1953 (11,4), 2001 (84,4)
Awash I (Koka)	Awash	Hydro, small (<50 MW)	45,6	Utility	1960
Awash II and III	Awash	Hydro, large	64	Utility	1966 (16), 1967 (48), 1971 (64)
Fincha	East Wellega	Hydro, large	134	Utility	1973 (100), 2002 (134)
Axum	Axum	Diesel	3,2	Utility	1975
Melka Wakena	Shebelle	Hydro, large	153	Utility	1989
Aluto I	Aluto Langano	Geothermal	7,5	Utility	1998 (7,5), 2002 (0), 2008 (3)
Adwa	Adwa	Diesel	3	Utility	1998
Kaliti	Kaliti	Diesel (ICE)	14	Utility	2003
Gilgel Gibe I	Omo	Hydro, large	184	Utility	2004

³ A 20-year 400 MW PPA was recently signed between Ethiopia and Kenya.

⁴ Aba Samuel represents the oldest hydroelectric power plant in Ethiopia. Its operation was suspended between 1974 and 2012. In 2014, PowerChina Huadong Engineering Corporation completed the rehabilitation of the plant. This incurred a cost of \$14m and was financed through a grant from the Government of China (Africa Energy, 2019).

Dire Dawa	Dire Dawa	Diesel	40	Utility	2004
Awash 7 Kilo	Awash	Diesel	35	Utility	2004
Gilgel Gibe II	Omo	Hydro, large	420	Utility	2010
Tana Beles	Bahir Dar	Hydro, large	460	Utility	2010
Tekeze	Tekeze	Hydro, large	300	Utility	2010
Fincha Amerti Neshe (FAN)	Horoguduru Wollega	Hydro, large	95	Utility	2011
Adama I	Adama	Wind	51	Utility	2012
Ashegoda	Ashegoda	Wind	120	Utility	2012
Adama II	Adama	Wind	153	Utility	2014
Gilgel Gibe III	Omo	Hydro, large	1870	Utility	2016
Reppie waste-to-energy plant ⁵	Addis Ababa	Biomass	25	Utility	2018
Ayisha II	Ayisha	Wind	120	Utility	Under construction Expected COD = early 2019
Genale Dawa III	Genale	Hydro, large	254	Utility	Under construction Expected COD = mid 2019
GERD ⁶	Guba Woreda	Hydro, large	6000	Utility	Under construction Expected COD = 2022 onwards
Gilgel Gibe IV (Koysha)	Omo	Hydro, large	2160	Utility	Under construction Expected COD = uncertain
Tendaho I	Dubti	Geothermal	10	Utility	Under construction. Expected COD = uncertain
Corbetti I (Pilot) ⁷	Shashamane	Geothermal	10	IPP	No financial close
Tulu Moye I	Arsi Zone	Geothermal	50	IPP	No financial close, only drilling
Finchaa Sugar Factory Bagasse	Finchaa	Biomass	31	Embedded	1998 (9,8), 2012 (31)
Wonji Sugar Factory Bagasse	Adama	Biomass	31,5	Embedded	2013
Omo Kuraz II Bagasse	Kuraz	Biomass	60	Embedded	2017
Tendaho Sugar Factory Bagasse	Asaita	Biomass	60	Embedded	2017
Omo Kuraz III Bagasse	Kuraz	Biomass	60	Embedded	2018
Tana Beles I Bagasse	Agew Awi	Biomass	30	Embedded	Under construction Expected COD = 2020
Omo Kuraz I Bagasse	Kuraz	Biomass	45	Embedded	Under construction Expected COD = uncertain

⁵ The Reppie Waste to Energy Plant (located at the Reppie main landfill site) is the first plant in Africa to use dry waste to generate electricity. The plant currently processes over 1000 tons of municipal waste a day. Although the plant has two 25 MW turbine generators, it is only capable of operating at 25 MW because the current boiler is only sufficient of delivering steam to power one of the two generating units. The project cost of \$119 million was fully borne by the GoE. The development and construction of the plant was undertaken by a consortium: Cambridge Industries Ltd and China National Electric Engineering (EEP, 2014).

⁶ The GERD is about 65% complete. At COD, it will be the largest hydroelectric power plant in Africa.

⁷ The Corbetti geothermal power plant will be the largest geothermal power plant in Africa when all the phases are completed.

Omo Kuraz V ⁸ Bagasse	Kuraz	Biomass	120	Embedded	Under construction Expected COD = uncertain
Tana Beles II Bagasse	Agew Awi	Biomass	30	Embedded	Under construction Expected COD = uncertain

Source: Authors' compilation

Note: All embedded power plants are state-owned. They feed the sugar factories, and only supply a fraction of their output to the grid. Most of the currently operational power plants in Ethiopia have a low capacity factor; therefore, installed capacity isn't a close reflection of operational capacity.

China & Ethiopia's power sector

China's prominent role in the Ethiopian power sector warrants further discussion. It has for a long time been considered a strategic technical and financial partner for the Ethiopian power sector, built in part on Chinese companies' ability to offer low prices based on concessionary finance from China's Export-Import (EXIM) bank. China's main investments have focused on three areas (Fox, 2019; GCR, 2019):

- Transmission lines: In April 2019, the Chinese government - through China Export and Credit Insurance Corporation (Sinasure) - pledged to invest US\$1.8 billion in Ethiopia's transmission and distribution networks.
- Hydropower plants: China EXIM bank has financed several hydropower projects, including Gilgel Gibe III, Finchaa-AmertiNeshe and part of the Grand Ethiopian Renaissance Dam. Chinese companies are also involved in several hydropower projects as engineering, procurement, and construction companies (EPCs), operations and maintenance (O&Ms) and/or project sponsors. For example China Gezhouba Engineering Group (CGGC) is the project sponsor and EPC for the Genale Dawa III hydropower project, as well as the EPC for the Finchaa Amerti Neshe project.
- Wind power projects: HydroChina is the EPC for the Adama Wind Farm II, and DongFang Electric is the EPC for the Aysha Wind Farm II.

China's prominent role in the sector has not been without its critics. There is growing concern about the fact that 59% of Ethiopia's external debt is owed to China. There have also been concerns raised about the fact that the GoE reportedly pledged land and natural resources as collateral when securing loans from Chinese banks. In response to the current administration's efforts at restructuring some of its previous debt arrangements, China has agreed to increase loan repayment terms from ten to thirty years and to also waive all compounded interest (estimated at between US\$12-20 billion) incurred from previous debt (Fox, 2019; GCR, 2019). The poor operational performance of some Chinese-built projects (e.g. Adama Wind Farm) further adds to concerns about China's prominent role in the sector. Despite these concerns and the apparent reorientation of the Ethiopian state towards the West as it opens up its economy, current indications are that China will remain a strategically important partner for the country and its power sector in the near- to medium-term.

Private power investment in Ethiopia

There have been several attempts at securing private power generation investment (IPPs) in Ethiopia, none of which have been realised to date (Table 3). The 150 MW Gojeb hydropower project was to be Ethiopia's flagship IPP, set to cost more than US\$300 million and slated to reach commercial operation in 2004. It unfortunately never advanced beyond the feasibility

⁸ This is the last of four Omo Kuraz Sugar Development Projects. The initial plan was to develop six projects, but two projects – Omo Kuraz IV and VI – are no longer being developed.

assessment stage (Africa Energy, 2019). In 2017 the PPAs for the Corbetti and Tulu Moye geothermal projects with a combined potential capacity of more than 1 GW were signed. Corbetti was developed first as a public private partnership between Corbetti Geothermal Plc, EEP and the GoE on a Build-Own-Operate-Transfer (BOOT) basis. The directly negotiated project was set to be developed over eight to ten phases, finally amounting to more than 500 MW and US\$2 billion in investment. If fully developed it would represent Africa’s biggest geothermal plant. The first phase (10 MW) would test the PPA and confirm the available geothermal resource, and was set to be entirely equity funded by the US-Icelandic lead developer – Reykjavik Geothermal – as well as the Africa Renewable Energy Fund (AREF) and Iceland Drilling as equity partners. If the first phase proved to be successful, a debt-financed second phase (50 MW) was set to be immediately implemented. While the project documents have been negotiated over several years, the project has still not reached financial close.

The 520 MW Tulu Moye project was developed and negotiated along similar lines, comprising a PPP between EEP, the GoE, and Tulu Moye Geothermal – a consortium comprising Reykjavik Geothermal, Berkeley Energy, Meridiam, and Africa Infrastructure Company. It was also set to be developed in phases, starting at 50 MW in phase 1 and ramping up to 270 MW in phase 4. The project has since been downscaled to 150 MW. Financial close is unlikely to be reached by the expected date of April 2020 and COD will need to be moved out beyond December 2021 (Norton Rose Fulbright, 2016; Africa Energy, 2019). Ethiopia has also competitively procured three solar PV projects, all of which still need to reach financial close: the 100 MW Metehara Solar project in 2016 and the Gad and Dicheto projects (125 MW each) in 2019. These three solar projects and their respective procurement programmes will be the core focus of this report.

Table 3: List of Ethiopia’s IPP pipeline projects (excluding planned projects)

Project name	Technology	Capacity (MW)	Cost (US\$ millions)	Status
Genale Dawa 6	Hydro	469	793	Development
Chemoga-Yeda I &II	Hydro	280	729	Development
Halele Warabessa	Hydro	424	1200	Development
Dabus	Hydro	798	984	Awarded (ICB)
Geba I & II	Hydro	372	572	Development
Tams	Hydro	1700	3242	Development
Tekeze II	Hydro	450	1690	Site survey
Fentale	Geo-thermal	150	750	Development
Metehara ⁹	Solar PV	100	120	Awarded (ICB)
Gad	Solar PV	125	150	RfP (ICB)
Dicheto	Solar PV	125	150	RfP (ICB)
Mekele	Solar PV	100	120	RfQ (ICB)
Humera	Solar PV	100	120	RfQ (ICB)
Welenchetti	Solar PV	150	165	RfQ (ICB)
Weranso	Solar PV	150	165	RfQ (ICB)
Metema	Solar PV	125	150	RfQ (ICB)
Hurso	Solar PV	125	150	RfQ (ICB)

Source: Authors’ compilation

Ethiopia’s current administration has made it clear that it intends to secure all future power generation through IPPs. The Public Private Partnership (PPP) Proclamation established the framework that guides the procurement process for any new PPP projects – including IPPs. The

⁹ Represent Ethiopia’s first competitively procured IPP.

proclamation prioritised competitive bidding as the preferred procurement method, but also made provision for competitive dialogue, direct negotiation and unsolicited proposals. The following sections will investigate the design and implementation choices of and the challenges faced by renewable energy IPP procurement programmes in the context of Ethiopia's complex transition to private-sector led power capacity development.

3 Renewable energy auctions

Up until now, Ethiopia has not fully realised the promise of its renewable energy auction programmes, despite impressive initial results. The country's experience with renewable energy auctions officially started in 2016 when EEP launched the first tender to build, own and operate three 100 MW solar PV projects. ENEL Green Power (EGP) was selected as the preferred bidder for one of the projects, located near Metehara, at a cost of US\$58,98/MWh, while the remaining sites, Mekele and Humera, were not awarded. Metehara represents Ethiopia's first competitively procured IPP and was expected to serve as a beacon to guide prospective IPPs looking to invest in Ethiopia's power sector. It is therefore deeply unfortunate that more than two years after being awarded, and despite substantial support from the likes of the World Bank and USAID's Power Africa programme, this project has still not reached financial close. EEP also launched competitive bidding processes for three hydropower projects: Dabus (298 MW), Tams (1700 MW) and Chemoga Yeda (280 MW) in the 2016-2018 period, none of which have been awarded to date.

Scaling Solar represented a more mature and potentially more promising prospect for advancing the country's IPP agenda. It is a programme designed by the World Bank group to facilitate competitive, open, and transparent procurement of utility-scale, on-grid solar PV projects in frontier markets by leveraging the bank's skills, experience, reputation, and risk-mitigation products. Scaling Solar-procured projects have broken sub-Saharan African solar PV project tariff records twice in the past three years – first in Zambia, where a project was awarded at US\$6/kWh in 2016, and then again in Senegal in 2018, with an award of US\$4,3/kWh (Kruger and Eberhard, 2018; World Bank Group, 2018c). All projects so far awarded under Scaling Solar have managed to reach financial close, with Zambia's plants having commenced commercial operation in early 2019.

Ethiopia's involvement with Scaling Solar started in 2016 at around the same time that Metehara was going to market. The programme was designed to be rolled out in two phases, with the first phase of 250 MW going to market in 2019. A second phase was expanded to 500 MW (four projects) in April 2019, and 750 MW (six projects) in May 2019 (The World Bank Group, 2019). The country was also scheduled to test and implement the Scaling Wind programme, which would be the Scaling programme's first official attempt at applying its approach to a new technology (World Bank Group, 2019). The first round of Scaling Solar in Ethiopia has been shrouded in confusion and uncertainty, despite awarded projects again breaking African solar PV price records (US\$2,5/kWh) in 2019 (Hamilton, 2019).

In the rest of this section we analyse the design elements of both the Scaling Solar and Metehara auction programmes. The focus is on how the auction volume was decided and divided (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

Ethiopia's electricity generation expansion is based on five-year planning frameworks that have repeatedly proved to be unrealistic in their scope and ambition. EEP has developed a long list of potential IPP projects covering various technologies that appears to be primarily based on its analysis of grid capacity constraints. The absence of an integrated, dynamic, rational plan that provides predictability and certainty to investors and other stakeholders is arguably undermining Ethiopia's ambitions of diversifying its energy mix and increasing generating capacity on a least cost basis. Targets are frequently adjusted and plans changed seemingly overnight, with little communication taking place between government and other stakeholders affected by these decisions.

This lack of co-ordinated planning is evident in how Ethiopia rolled out its solar PV IPP procurement programmes. In 2016 EEP's initial procurement of 3 x 100 MW projects quickly changed to the single 100 MW Metehara project when awarded bids were announced in 2017, with no communication as to why the other two sites had not been awarded. Industry would later learn that these two sites had been folded into the Scaling Solar programme, although at slightly larger (125 MW) capacities. In April 2019, Scaling Solar Round 2 targets were similarly adjusted, from an initial 500 MW to 750 MW only a month later (May 2019). In each case there was very little communication as to the reasons for the decisions. Investors and other stakeholders were left to wonder whether these adjustments represented "real" prospects.

Ethiopia's power sector ambitions are also evident in how the country has divided its auction volume. Most auction programmes in the sub-Saharan region have focused on procuring solar PV projects of between 5-50 MW. South Africa has been the single exception, with solar PV projects in its Renewable Energy Independent Power Producers Procurement Programme (REI4P) limited to 75 MW (Kruger and Eberhard, 2018). Ethiopia's auctioned IPP projects have all been between 100 and 125 MW in size, which, if built, would be the largest solar PV projects in sub-Saharan Africa. This emphasis on scale is mainly driven by the need for cost competitiveness. For example the Scaling Solar Request for Proposal (RfP) documentation asked bidders to base their project sizing on achieving the lowest price rather than maximising the project's capacity (within 100-125 MW bounds).

Site selection

As with most renewable energy auction programmes in sub-Saharan Africa, a government-led project site selection and preparation process has proved to be deceptively difficult to get right. In Ethiopia – as in several other states in the region – all land is owned by the state. This does not mean that government-led land use changes are uncontested. In fact, the Ethiopian state's relocation and resettlement programmes related to for example infrastructure projects in and around Addis Ababa, have led to the widespread protests and ethnic conflicts that resulted in the long-standing state of emergency declaration of 2016 (BBC, 2018). While the state of emergency was eventually lifted in 2019, the (re-)distribution of land remains a politically fraught issue that threatens the successful implementation of the country's private power investment ambitions.

The Metehara project is a visceral reminder of the importance and difficulty of properly selecting and preparing a project site. EEP selected the project site and committed to providing bidders with geotechnical studies and a detailed environmental and social impact assessment (ESIA) report prior to the bid submission deadline. However, this was not ready when the RfP was released. Awarded bidders were required to construct a substation – to be handed over to

EEP on completion – at the project site, while EEP would be responsible for providing a connecting transmission line. The land lease agreement was not pre-negotiated by EEP: awarded bidders needed to first obtain an investment permit, then submit an investment proposal with a land request application to the Oromia Investment Commission (OIC), who would refer it to appropriate local government body. The local government body would refer the application back to the OIC, who would then sign the lease agreement. To begin with this was already a long and complicated process. During the ESIA process (led by consulting firm Multiconsult) it however became clear that the affected community, Fentale woreda, was not in favour of the project as it fell within a planned large-scale irrigation programme. This prevented further study of the site. In June 2017, a field team comprising of experts from Multiconsult and EEP was deployed to engage with local stakeholders affected by the proposed site. The field mission was later terminated because Fentale woreda refused to approve the project. Following that the project's ESIA was effectively suspended. In October 2018, EEP informed Multiconsult (the ESIA consultant) that Fentale woreda had selected an alternate site for the project that was nearby the initially proposed site. Multiconsult recommenced the ESIA and completed the report on April 23, 2019 – more than two years after bids had been submitted and awards announced (Multiconsult, 2019). There have been further reports that the site has been changed again, further delaying financial close and apparently prompting the selected bidders to try and open negotiations with EEP on adjusting the project's tariff. At the time of writing, the project has still not reached financial close and it is not clear that the site-related problems have been resolved.

The Scaling Solar programme appears to have incorporated some lessons from the Metehara project as well as its experiences in Zambia – where site issues caused severe delays – into the site preparation process (Kruger, Stritzke and Trotter, 2019). While site selection remained a government-led process, a considerable amount of time and resources were spent on preparing these for bidding. EEP provided bidders with site climatic and solar resource studies; site surveys, including topographical surveys, geotechnical studies, hydrological surveys, water resources studies and seismic studies; and environmental and social scoping reports as part of the RFP documentation. EEP furthermore pre-negotiated land lease agreements for the Gad and Dicheto sites (Figure 3) with local authorities, although the IPP was still expected to finalise these agreements. It is encouraging to see that there has been growing recognition of the importance of site selection and preparation for project realisation, though whether the Scaling Solar programme has done enough in this case remains to be seen.

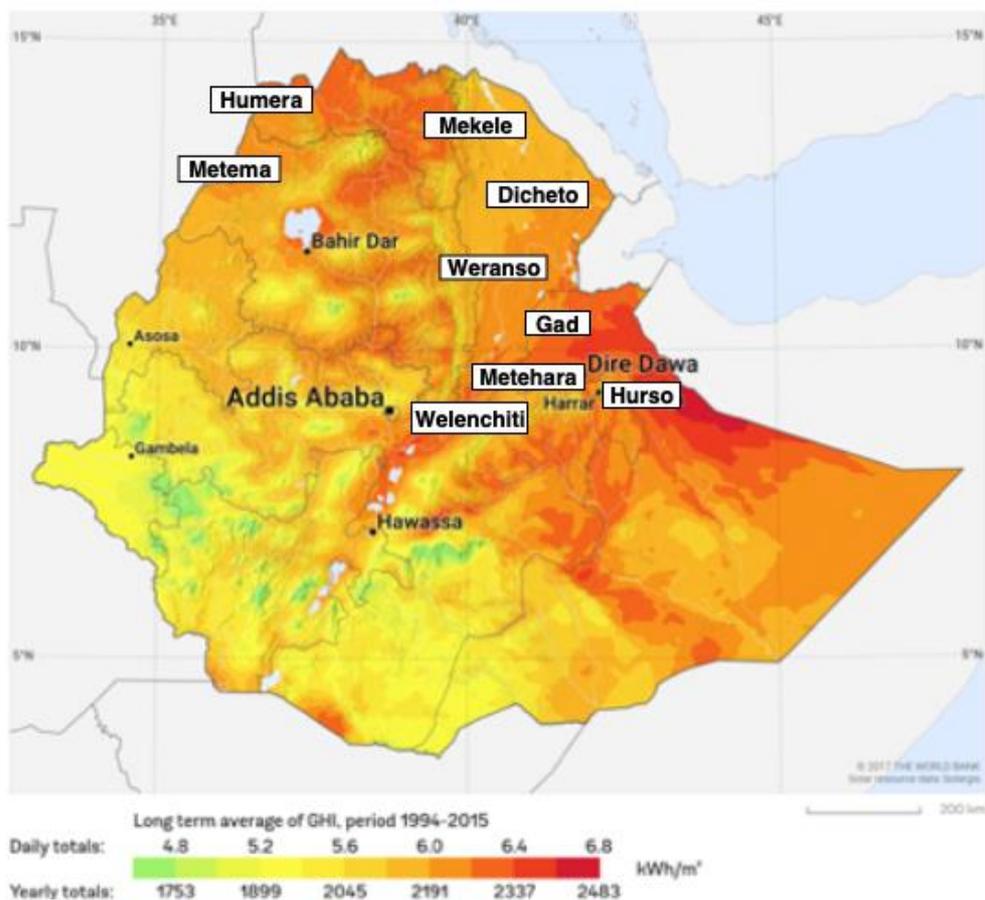


Figure 3: Global Horizontal Irradiance levels for Metehara and Scaling Solar I & II projects

Source: Authors' adaptation from the World Bank¹⁰

Qualification and compliance requirements

Both Metehara and Scaling Solar made use of a 2-step bidding process, consisting of a prequalification stage followed by a full request for proposals being issued to shortlisted firms. Metehara attracted substantial interest, with 65 firms responding to the request for expressions of interest. In the end only five large, international firms were selected to advance to the full proposal stage, with all five choosing to submit full proposals (Table 4). Round 1 (2 x 125 MW) of the Scaling Solar programme also attracted substantial interest, with 28 firms submitting bids in response to the Request for Qualification. Of these, 12 consortia were prequalified, based on their proven technical and financial capabilities and experience. The qualifying consortia tended to be made up of large, international companies with substantial experience and financial backing (Table 5). In fact, the qualification criteria appeared to have been set so high that only three of the biggest companies – ENEL Green Power, Scatec Solar, and Mitsui – were able or willing to qualify on their own merit (without forming part of a consortium). Of the 12 prequalified consortia, only five decided to submit a full proposal. This is surprising when one considers that in Zambia's smaller (2 x 50MW) Scaling Solar programme, seven of the 11 prequalified firms submitted bids. One prequalified bidder commented that enduring uncertainty about the Ethiopian government's treatment of risk allocation – especially on issues of foreign exchange convertibility and availability – ultimately resulted in them deciding not to

¹⁰ See: <https://globalsolaratlas.info/downloads/ethiopia>

incur the costs of bidding. In the end the firm’s decision appeared to have been justified by the auction results.

Table 4: Prequalified bidders for Metehara and Scaling Solar 1

Metehara Solar PV	Bid submitted	Scaling Solar Round 1	Bid submitted
Fotowatio Renewable Ventures B.V. (FRV)	Yes	FRV/Globeleq/Belayab Consortium	No*
Meridiam-Solairedirect Consortium	Yes	Acciona/Swicorp Consortium	No
ENEL Green Power S.P.A.	Yes	ENEL Green Power	Yes*
The Building Energy Consortium	Yes	Actis/Mulilo Consortium	No
CCE Oasis Technology	Yes	ACWA Power	Yes
		Al-Nowais (AMEA) /Aldwych/Alten Consortium	Yes*
		EDF/Masdar Consortium	Yes*
		Scatec Solar	Yes
		KOSPO/KEPCO E&C Consortium	No
		Mitsui	No
		Nareva/Adani Consortium	No
		Access/Total Eren Consortium	No

Projected timelines turned out to have been overly optimistic for both programmes (Table 5). Key milestones such as the issuing of full Request for Proposal (RfP) documents, bid submission deadlines, successful bidder announcements and commercial close dates, have been moved out repeatedly, in some cases by many months. This is somewhat understandable in the context of a nationwide, multi-year state of emergency, a change in political leadership in 2018, and the initiation of major political and economic reforms. But it nevertheless undermined bidder confidence in the bidding programmes – both in the process and the implementing authorities. The failure of Metehara to reach financial close and the controversy surrounding the Scaling Solar results have further eroded investor confidence and could depress interest in new bidding rounds.

Table 5: Timelines for the bidding processes

Phase	EEP/Metehara	Scaling Solar Round 1
Issue of RfQ	-	4 October 2017
RfQ submission deadline	-	21 November 2017
Prequalified bidders announced	-	23 March 2018
Issue of RfP	9 May 2016	2 April 2019 (originally slated for January 2018)
Pre-Bid Meeting	1-2 June 2016	9 May 2019
Release of IA and Connection Agreement	31 August 2016	
Clarification request deadline	13 September 2016	23 May 2019

Bid Submission Date	16 January 2017 (changed to Feb 2017)	15 August ¹¹ (originally 28 June 2019)
Technical and Commercial Proposals evaluation qualification notification	22 February 2017	3 September 2019
Financial Proposals evaluation notification and Successful Bidder announcement	23 March 2017* (only announced October 2017)	3 September 2019
Letter of intent issued to successful bidder(s)	July 2018	15 October 2019
Commercial Close: PPA and IA signing	7 August 2017*	Still to be finalised (originally scheduled for 10 October 2019)
Financial Close	21 August 2017* (still not achieved)	TBD
Scheduled Commercial Operation Date	5 February 2019* (expected in 2021)	TBD

Source: RfP documentation

Qualification criteria

Legal and technical compliance

Both the Metehara and Scaling Solar procurement programmes asked bidders to prove that the project partners, their proposed contractors as well as equipment suppliers had adequate experience and capacity. For Metehara, interested bidders needed to provide evidence of having developed, designed, constructed, financed, operated, and maintained at least two solar PV projects larger than 20 MW – quite small considering that Metehara was a 100 MW PV plant. Similar track record requirements were in place for the solar PV modules (at least 50 MW installed) and inverter technology (at least 50 MW installed). Scaling Solar’s technical qualification requirements were more substantial: bidders needed to prove their technical expertise by submitting evidence of having developed, financed, built, and operated at least: one solar PV plant in Africa, with a minimum aggregate capacity of 25 MW (minimum 5 MW for each plant); one power plant in Africa of at least 75 MW; two solar PV plants in three different countries with a minimum aggregate capacity of 100 MW (minimum 10 MW for each plant); or one power plant anywhere in the world with an installed capacity of at least 1500 MW. For a plant to be considered eligible it needed to have been in operation for at least one year, and have a proven average annual availability of 97% for solar PV, 85% for hydro, 95% for wind, and 90% for any other technologies. Bidders under Scaling Solar furthermore needed to submit letters from solar PV module and inverter manufacturers confirming compliance and providing evidence that these components had been installed in at least three project-financed projects in the preceding two years. Eligible manufacturers also needed to show that they had been in operation for at least five years, had large volumes of equipment installed (a minimum of 5000 MW for panels and 3000 MW for inverters), had adequate manufacturing capacity (a minimum of 1000 MW/annum for panels and 300 MW/annum for inverters), and that the manufacturing facilities met various International Organization for Standards (ISO) requirements. Panels needed to bring a 10-year warranty and a guaranteed power output after 25 years of 80% of the initial nominal power. Eligible inverters similarly required a 10 year product warranty and a five year warranty against manufacturing defects.

¹¹ After two delays in the bid submission date (the first due to security concerns, the second to obtaining approval for the forex risk allocation consistent with Scaling Solar), GoE advised bidders on 5 July 2019 and uploaded revised project agreement documents and on 6 August 2019. There would be no further extensions on the bid submission date of 15 August 2019 and the forex risk allocation would be amended from what is envisioned under the normal Scaling Solar framework to align with existing NBE directives.

Prequalified bidders in both programmes also had to prove that their intended EPC and O&M contractors were capable of building and operating the projects. For the Metehara project there was little clarity provided as to what counted towards meeting this threshold. No minimum requirements for EPC or O&M contractors' qualifications, experience, or performance record were set. Bidders also needed to demonstrate the proposed contractors' commitment to the project, but without any stipulation in the RFP documentation as to what would qualify as sufficient proof of such commitment. Scaling Solar was more precise: bidders could propose between one and three EPC and O&M contractors, each of which needed to have a proven track record of having constructed and/or operated at least two projects of similar size, using similar technology. For O&M contractors eligible projects also needed to have proven availability of above 97%. Bidders furthermore had to submit independently conducted yield/generation forecast reports on a P50, P90 (and P75, in the case of Scaling Solar) basis.

Neither programme required bidders to have set up or registered a dedicated project company or special purpose vehicle (SPV) prior to bidding, although bidders did need to indicate how shareholding would be made up in the project company. This included a minimum 5% local shareholding requirement under Scaling Solar – the first instance of such a requirement for the programme. Local ownership was not a qualification requirement for the Metehara project, although it was considered as part of the bid evaluation/scoring criteria (to be discussed under Winner Selection). Both programmes also required bidders to commit to a minimum level (15%) of local content which was another first for Scaling Solar. Therefore bids had to include a detailed table listing and costing each item (logistics, engineering, civil, mechanical, and electrical) that would be procured locally. Under Scaling Solar, EEP also provided bidders with legal, tax and accounting, and insurance due diligence reports.

Financial and commercial capability

Bidders for both the Metehara and Scaling Solar projects were expected to demonstrate that they were able to mobilise sufficient funding (debt and equity) to develop the project. For Metehara, bidders had to provide evidence of having raised more than US\$200 million worth of funding for previous power projects, in addition to providing their most recent audited financial statements. Scaling Solar's financial qualification requirements were more detailed: an anchor sponsor needed to have a net worth of at least US\$190 million, with a net worth to total asset ratio of at least 15%. In the case of a consortium, the lead sponsor needed to have a net worth of at least US\$95 million, while the anchor sponsors still needed to prove that between them their net worth came to more than US\$190 million (while still maintaining the 15% net worth to total asset ratio).

Financial commitment was handled differently by the two programmes. Lenders were required to submit credit-committee approved¹², signed term sheets for the Scaling Solar projects which were subject to final due diligence-based approval. The Metehara project had no such requirement, with bidders only needing to present a financing plan without specific indications of commitment by either equity or debt providers. Both programmes also required each bid to be accompanied by detailed financial models.

¹² GoE has indicated that this was not required, although it was clearly stated in the RfP documentation.

Environmental and social sustainability

The setting and interpretation of environmental and social sustainability criteria in both programmes appear to have been closely aligned. Both programmes would see the procuring authority provide bidders with an ESIA study conducted by a reputable third party in accordance with the IFC's environmental and social performance standards¹³. Successful bidders would nevertheless remain ultimately responsible for obtaining the necessary environmental and social consents for the sites selected by the GoE. As previously discussed, there were significant problems with the site originally selected for the Metehara project that ultimately required the selection of a new site in collaboration with the affected community. There are however still concerns about the new site. The biggest worry is the potential physical (38) and economic (524) displacement of 562 households that would require consent and appropriate compensation (Multiconsult, 2019). In early 2019, a resettlement action plan (in compliance with the prevailing resettlement policy framework) was developed to outline the necessary steps involved for all parties concerned with this process (World Bank Group, 2019). At the time of writing this report it was not clear that the affected parties had agreed on the way forward.

Both programmes also encouraged projects to contribute to local economic development by making use of local content and incorporating local ownership into the project company. As mentioned, both programmes required that at least 15% of projects' CAPEX be made up of local content. Furthermore for the Metehara project, bids were scored on the amount of local content that was included in their projects. Complying with this requirement proved more difficult than envisioned. As one bidder claimed, "you can't even source galvanised steel in Ethiopia". It remains to be seen whether these local content requirements were based on realistic assessments of Ethiopian industrial, manufacturing, and professional services capacity. Or whether, as has been the case in other auctions in the region, most notably in South Africa, these requirements were developed in the absence of a supporting, overarching industrial policy framework (Leigland and Eberhard, 2017). Local shareholding in the project company was an additional requirement in both programmes that was set at a minimum level of 5%¹⁴. In the case of Metehara it was also incentivised through being included in the bid scoring criteria. The Scaling Solar RfP documentation asked bidders to commit to training and hiring Ethiopians (although not a qualification requirement) and made it clear that failure to comply with the local content and shareholding requirements would result in the bidder being barred from participating in any further Ethiopian public private partnership (PPP) tenders for a period of five years.

Bidder ranking and winner selection

The Metehara evaluation process scored and ranked bids on both technical and financial criteria on a 30:70 basis (Table 6). Bidders were scored on their technical capability and experience (number of reference projects and total installed capacity); the track record of the modules and inverters to be used (total installed capacity); and the share of local content as well as local ownership in the project. Each category was scored against a point-based matrix (Table 7) that clearly stipulated the number of marks or points to be awarded. Only bids that scored more than

¹³ The Metehara RfP documentation did not explicitly mention the need for compliance with the IFC's E&S performance standards. Nevertheless, the likely prominence of the development finance institution (DFI) funding for awarded projects meant that bidders could reasonably assume that compliance would be required.

¹⁴ In the case of Scaling Solar, for a minimum period of five years.

21 out of 30 had their financial envelopes opened and were scored on their respective tariffs. While the proposed tariff carried the most weight, the technical criteria appear to have ultimately determined the awarding decision.

Table 6: Bid scoring criteria

Criteria	Points
Technical and commercial score	30
Technical capability and bidder's experience	10
Track record of module	5
Track record of inverter	5
Local content in CAPEX	5
Local ownership	5
Tariff (financial score)	70
Total score	100

Source: RfP documents

Table 7: Breakdown of the technical and commercial scoring criteria

No of reference projects ¹⁵	Total installed capacity ¹⁶	PV module track record ¹⁷	Inverter technology track record ¹⁸	% of value of local content spend as % of total project value	% of local ownership	Marks
>=6	>300 MW	>5 GW	1 GW	>35%	>10 %	5
5	200 > 300 MW	2 > 5 GW	0.3 > 1 GW	30 > 35%	7.5 > 10%	4
4	100 > 200 MW	1 > 2 GW	200-300 MW	25 > 30%	5 > 7.5%	3
3	40 > 100 MW	0.5 > 1 GW	100-200 MW	20 > 25%	2.5 > 5%	2
2	40 MW	50 > 500 MW	50-100 MW	15 > 20%	0 > 2.5%	1
		50 MW	50 MW	15%	0%	0

Source: RfP documents

The Scaling Solar programme has consistently used price as the only scoring criterion, preferring to analyse technical issues on a pass or fail basis as part of the qualification process. The Ethiopian evaluation process introduced a slight change in the RfQ documentation, which stated that an incentive structure would be included in the RfP that would reduce the price of electricity offered – for evaluation purposes only – based on the amount of local shareholding and local content in the project. This discount would be capped at 5% of the price of electricity offered for local content, and 5% for local shareholding. However, this provision was not repeated or included in the RfP documentation due to the new PPP legislation not allowing for it. As a result it is unclear whether or not local content and local shareholding formed part of the project evaluation criteria.

The Scaling Solar bidding process also provided for the possibility of a single bidder submitting the lowest price for both projects. In such a case, the second, third and fourth lowest bidders

¹⁵ Number of valid reference projects where the capacity of each project is greater or equal to 20 MW utilising solar PV that has been constructed, commissioned and entered operations under the bidder's ownership during the last ten years.

¹⁶ The total number of MW of installed capacity of projects (each with a minimum capacity of 10 MW) using solar PV that has been constructed, commissioned, and entered operations under the bidder's ownership.

¹⁷ Total number of MW of respective module technology manufactured for use in utility PV plants, of the same type offered by the bidder.

¹⁸ Total number of MW of respective inverter technology manufactured for use in utility solar PV plants and of the same inverter type.

would be asked to meet the lowest price that was bid for that project. If none of these bidders could meet this price, both projects would be awarded to the lowest bidder. It seems as if the programme wanted to reduce the risk of projects not being built by awarding bids to two different bidders, while not losing the cost benefit. This is a slightly different approach than what was taken in Zambia's Scaling Solar programme, where the RfP documentation made it clear that only one project could be awarded per bidder.

Seller and buyer liabilities

Financial prequalification and penalties

The Metehara and Scaling Solar projects made use of financial qualification and penalty mechanisms to incentivise bidder compliance and commitment. Bidders for the Metehara project were required to post a bid bond of US\$300,000 which was equivalent to US\$3000/MW. This is significantly cheaper on a per MW level than the bid bond requirements in South Africa (US\$8000/MW), Uganda (US\$10,000/MW) and Zambia (US\$15,000/MW for GET FiT, and US\$26,000/MW for Scaling Solar). Bid bond requirements in the Scaling Solar Ethiopia RfP documentation and the draft PPA seemed contradictory: in the RfP documentation the bid bond was set at US\$1 million per project – or US\$8000/MW – comparable to South Africa. In the PPA, bidders were also required to post a bid bond equivalent to the IFC's advisory fee (US\$20,000/MW) and the Project Development Cost (strangely set at US\$0 in the PPA). While bid bonds for both programmes appear to have been relatively cheap on a per MW basis, these were still substantial amounts due to the sizes of the projects involved (100-125 MW) – especially if one considers that in the case of Scaling Solar most bidders would have bid on both projects. These substantial total bid bond amounts may in part be responsible for the relatively low number of bid submissions for the two programmes. This was confirmed in the case of one of the prequalified Scaling Solar bidders.

The bid bonds needed to be replaced by performance bonds on project award. For Metehara, this meant that the successful bidder needed to provide security of US\$1,5 million that would be in place until the project reached financial close. Failure to reach financial close by the long stop date would automatically result in the bidder losing the bond to EEP. In reality this has not been the case as the project has still not reached financial close more than two years after being awarded. While this is largely due to issues outside of the bidder's control, it is also in line with global and regional trends where performance bonds are rarely if ever called on. Under Scaling Solar a performance bond of US\$25 million per project was required, which would be in place until the project reached COD. The RfP documentation also required a performance bond from the EPC contractor equivalent to 25% of the EPC cost, for the same term.

Performance and commitment was also incentivised through various other penalty regimes. The Metehara project PPA included a liquidated damages (LD) clause of US\$55,000/day – capped at US\$10 million – for each day that the project failed to reach its commercial operation date (COD). Under Scaling Solar liquidated damages of US\$15,000 (10% of the bid bond), capped at US\$1,5 million, could be charged for each week that the bidder failed to sign the PPA and other documents by the required deadline. If the annual PV plant performance ratio is below 75% of the estimated PV plant performance ratio, the IPP would also need to pay US\$15,000 for each 0,1% below 75 (capped at US\$1,5 million/year). Both Metehara and the Scaling Solar documentation set a minimum acceptance capacity of 80%, meaning that if the achieved capacity at COD was below this, the PPA could be cancelled. If the project's achieved capacity

at COD was between 80% and 100% of the originally contracted capacity, the contracted capacity would be adjusted to reflect this.

Finally, project owners would be liable for decommissioning at the end of the PPA term; in the case of Scaling Solar, this would be enforced by the posting of a US\$100,000/MW decommissioning bond one year before the end of the PPA.

Buyer liabilities

Under both bidding programmes bidders were provided with 20-year take-or-pay PPAs, denominated in US\$ (but to be paid in Birr) and – according to the draft PPAs that formed part of the RfP package – partially indexed at 2% escalation per annum. The GoE has since indicated that the tariffs are not indexed, although it is unclear whether this was communicated to bidders prior to bid submission. Under Scaling Solar bidders would also be able to be paid an early generation charge (set at 50% of the submitted tariff) for any energy produced before the scheduled COD. The key risk in the Ethiopian context – currency convertibility and availability – was originally allocated to the Ethiopian government in the Scaling Solar bidding documents, with the provision that this was subject to National Bank of Ethiopia (NBE) approval. The Ethiopian central bank’s refusal and/or inability to provide the kind of guarantee requested ultimately undermined this principle and led to the withdrawal of IFC finance from the Scaling Solar programme at the last hour, which effectively disqualified all bidders making use of the IFC’s proposed financing package. This is discussed further in the section below. The lack of foreign exchange availability has also delayed the financial close of the Metehara project – alongside the site-related issues – and will likely continue to be an enduring problem for most private power investment in the country.

Apart from the financial liabilities, EEP was also responsible for providing the transmission infrastructure for the projects. Given EEP’s track record of completing infrastructure projects on time and within budget (often in partnership with Chinese contractors and funders), this is not a major concern for bidders.

Securing the revenue stream and addressing off-taker risk

As already alluded to, risk allocation in the Ethiopian private power procurement programmes explains many of the outcomes, or lack of outcomes. IPPs in Ethiopia face various risks, but the two main risks relate to the off-taker (EEP) and the currency. EEP – while relatively efficient in executing capital – is still not close to what would be considered a financially and operationally health utility. Its transmission and distribution losses are around 25%, and the consumer electricity tariff is nowhere near being cost-reflective – barely covering operating costs (Trimble *et al.*, 2016). IPPs were therefore facing an unbankable off-taker for their power.

The Ethiopian government and its implementing partners appear to have been quite willing to help mitigate these off-taker risks. Both the Metehara and Scaling Solar projects were provided with sovereign guarantees (implementation/government support agreements) from the Ethiopian government that would cover debt (principal and interest), equity (outstanding and forecast return) and termination costs in the case of government default, and debt plus equity not yet contributed in the case of *force majeure*. They were also provided with six months’ worth of payment guarantees in the form of commercial bank letters of credit from EEP. These guarantees were furthermore supported by the World Bank Group through a dedicated Ethiopian Renewable Energy Guarantees Programme (REGREP) of US\$200 million. This would make optional guarantees available to backstop the letters of credit as well as the

sovereign guarantees. The World Bank's Multilateral Investment Guarantee Agency (MIGA) moreover provided optional cover for up to 90% of projects' equity and 95% of debt in the case of expropriation, war or civil disturbance. For Metehara, these World Bank guarantees were only made available post-award, while they formed part of the RfP package for the Scaling Solar projects. ACWA Power surprisingly chose not to use the World Bank's guarantee products for its bids.

The second area of risk – currency availability and convertibility – has been more difficult to de-risk. Ethiopia is notoriously short of foreign currency, a situation which has only gotten worse in recent years. The Ethiopian government's public investment drive means that it spends more forex than it earns, resulting in an unfavourable trade balance likely to persist for the next 15 to 20 years. Investors in priority sectors, like power, face delays of up to three months to access hard currency, compared to between six and nine months for the rest of the economy (Gordon, 2018). To deal with this, the Scaling Solar RfP documents included a very favourable guarantee of forex availability for IPPs, subject to approval by the NBE. This would be backstopped by a PRG inconvertibility guarantee, as well as inconvertibility cover by MIGA. When NBE signalled that it would not be offering this level of guarantee, these World Bank offers were no longer on the table. As discussed, IFC finance viewed this as undermining the bankability of the projects and therefore withdrew its term sheets for the Scaling Solar projects. As a result, ACWA Power, the only bidder to have not used IFC finance, was ultimately awarded.

4 Running the auction: the key role-players

Uncertainty, disruption and limited trust at the institutional and political level is at the heart of Ethiopia's apparent failure to realise its private sector-led renewable energy ambitions. Twice now the private sector has signalled its willingness to enter the Ethiopian power market with affordably priced renewable energy projects through auction programmes. But both cases have been marked by seemingly intractable challenges to meeting international investor and lender requirements. Ethiopia's lack of experience with private power investment partially explains this outcome, but to fully understand this situation one needs to go into further detail.

The fact that Ethiopia is in the midst of a comprehensive programme of political, economic, and institutional reform has important implications for private power investment. While the reforms are aimed, in part, at opening up the economy to greater foreign investment, the immediate reality is that the entire institutional landscape appears to be in flux. For a country that has for decades been built on a highly centralised, tightly controlled economic and political model, gradually opening up has proved to be disruptive and disorienting. Scaling Solar's RfP process was delayed by almost a year when Abiy Ahmed came to power in 2018 due to the wide-ranging nature of the accompanying institutional changes. During the critical post-award period for the Metehara project, EEP's central role in the procurement process was replaced (or at least diminished) by institutions created through the new PPP legislation. This included a new PPP board responsible for approving new projects and their underlying risk allocation, chaired by the Ministry of Finance and Economic Cooperation (MFEC) and constituted by members of the National Bank of Ethiopia, the Ministry of Water, Irrigation and Electricity, the Ministry of Transport, the Ministry of Public Enterprises, the National Planning Commission, the Ministry of Federal and Pastoralist Affairs and two members from institutions representing the private sector. The board is served by a newly created secretariat (PPP directorate general) hosted by the MFEC, which still lacks the critical skills, resources and power to drive PPP investment decisions at this early stage. Nevertheless, it was this newly formed PPP directorate general that was charged with implementing (in partnership with EEP) the Scaling Solar procurement process.

There was also a serious lack of co-ordination with and among key decision-makers during the procurement processes. For example despite the bidding documents for the Scaling Solar programme stating that all foreign exchange provisions in the documents were subject to approval by the National Bank of Ethiopia (NBE), they were only consulted around 4-6 weeks before the submission deadline. NBE responded that they were unable to provide the kind of foreign exchange availability and convertibility guarantees contained in the Scaling Solar documentation. Part of NBE's argument for its decision was that this would set a precedent for all current and future IPPs, which was simply unrealistic given the country's balance of payments situation. This announcement was followed by intensive but ultimately unsuccessful lobbying by the implementing partners – up to the level of the prime minister. When it became clear that these forex provisions would not be met, the IFC indicated a day before the bid submission deadline that it considered the projects unbankable and subsequently withdrew its term sheets. This effectively meant that four out of the five bids were now incomplete and were consequently disqualified. The GoE apparently allowed these bidders an extra two weeks to find alternative lenders, which none of them were seemingly able to do.

Despite some teething problems, the hopefully temporary uncertainties and gaps created by the various reforms can be resolved as new institutions and institutional configurations become formalised. Of greater concern is the political and institutional culture that underpins so much

of Ethiopia's decision-making systems. Modern Ethiopia was built on an ideology that prized the highly centralised, tightly controlled model of political and economic development championed most effectively by China. Political, economic and business interests are as a result tightly interwoven, with the largest companies being either state-owned or closely aligned with the ruling party (Gordon, 2018). This model was influenced by continued ethnic tensions in the country and supported by the powerful Ethiopian state security apparatus and intelligence services that remain deeply influential, despite the recent reforms. The result is an institutional culture that has been characterised as distrustful of what it sees as outside influence, and in particular of the private sector.

This distrust manifested in various ways during the auction processes. For example Ethiopian institutions were not willing to share project documentation with implementing partners. This stands in stark contrast with the approaches taken in Zambia, Uganda and – to some degree – South Africa, where foreign and/or private-sector advisors played a key role in shaping, implementing and advising on auction design, bid evaluation and approval processes (Kruger and Eberhard, 2018). Communication with the private sector – including bidders and their lenders, but also advisors – was also sporadic and wanting.

Despite this seeming mistrust, assistance from international agencies has been embraced, if somewhat reluctantly. USAID's Power Africa programme has been playing a prominent role, supporting the country's tariff review process, co-ordinating donor efforts, providing advisory services for the procurement and development of the Metehara project (including paying for the development of the PPA) and supporting the development of renewable energy regulations for IPPs. The US department of commerce has furthermore been providing capacity building support to the new PPP directorate and board on PPP legislation. Denmark has also been assisting the country's wind sector development, with a senior Danish advisor seconded to the Ministry of Water, Irrigation and Electricity. Together with the World Bank, the Danish embassy and Danish Energy Agency has been supporting wind mapping and measurement efforts, capacity building efforts on renewable energy auctions and project finance, and developing the potentially first instance of a Scaling Wind (similar to Scaling Solar) programme.

The World Bank has played a central role in the country's electricity sector, supporting institutional and tariff reform efforts and activities aimed at improving the enabling environment for private sector investment – including the development of a resettlement policy framework for solar and wind projects. The Scaling Solar programme – implemented by the IFC and supported by the World Bank's Multilateral Insurance Guarantee Agency (MIGA) and International Development Association (IDA) – is the most prominent manifestation of this support. Quite tellingly, the announcement of the successful bidder by the Ethiopian government was not accompanied by any statement from the Scaling Solar programme or the World Bank group, despite the entire process and the documentation used having been developed by them. In a holding statement issued in December 2019, the IFC stated: "Foreign exchange convertibility and transferability is a critical aspect of the risk allocation that enables the SSP standardised approach. Following extensive discussions between the World Bank Group and the Government of Ethiopia (GoE), the GoE decided to adhere to the existing National Bank of Ethiopia's Directive, which does not allow for a government guarantee of foreign exchange convertibility and transferability. The IFC was then unable to proceed with the standard SSP financing. As a result, the transaction is no longer a Scaling Solar transaction. The IFC will continue to advise the GoE in its efforts to attract private sector investment to its solar program in a fair and transparent manner."

Ethiopia exudes the central role of trust in both the bidding process, and in the implementing institutions. The ongoing uncertainty and lack of open engagement has resulted not only in confusion and frustration from the private sector (Hamilton, 2019), but also in the failure to actually secure any private power investment to date. No IPP – whether geothermal or solar PV-based – has managed to reach financial close. To be fair, it is still too early to reach any conclusion with regards to the projects awarded under the first round of Scaling Solar, but it seems clear from discussions with the private sector that bidders’ are not as willing as before to take part in new procurement rounds.

5 Auction outcomes

Both the Metehara and Scaling Solar (Gad and Dicheto) projects were awarded to two of the biggest renewable energy IPP companies in the world. Metehara was awarded to ENEL Green Power (EGP) at a price of US\$Dc 5,89/kWh – the lowest in sub-Saharan Africa (outside of South Africa) at the time of award. 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 REI4P programme, where it came to dominate the market during the later rounds of procurement. It also won, built, owns and operates the Ngonye project in Zambia’s first round of Scaling Solar. Interestingly, ENEL’s bid was not the cheapest (Table 8), indicating that the local ownership and local content evaluation criteria played a determining role in the award decision.

Table 8: Proposed tariff by pre-qualified companies for Metehara solar PV

Short listed Companies	Proposed Tariff (US\$/MWh)
Building Energy SPA Consortium	56,98
Fotowatio Renewable Ventures BV	58,48
ENEL Green Power SPA	58,98
Meridiam-Solairedirect Consortium	69,3499
CCE Oasis Technology Co.	80

The local shareholder of the Metehara project is an Ethiopian infrastructure, construction and logistics company called the Orchid Business Group. It is owned by the country’s wealthiest and most prominent businesswoman, Akiko Seyoum Ambave. Together, Orchid and Akiko Seyoum own 20% of the project company (Figure 4). Orchid employs between 2000 and 3000 people, and has experience in the construction and maintenance of infrastructure projects such as the Gibe II hydroelectric project and the Arba Minch airport. The remaining 80% of shareholding will be split between EGP and a European investor (after COD) (Figure 4). Equity partners are set to contribute about US\$30 million towards the project costs (World Bank Group, 2019). The remaining US\$90 million will be debt-financed. At this stage it is not clear who will be providing the debt, although EGP has been in discussions with various DFIs, including IFC.

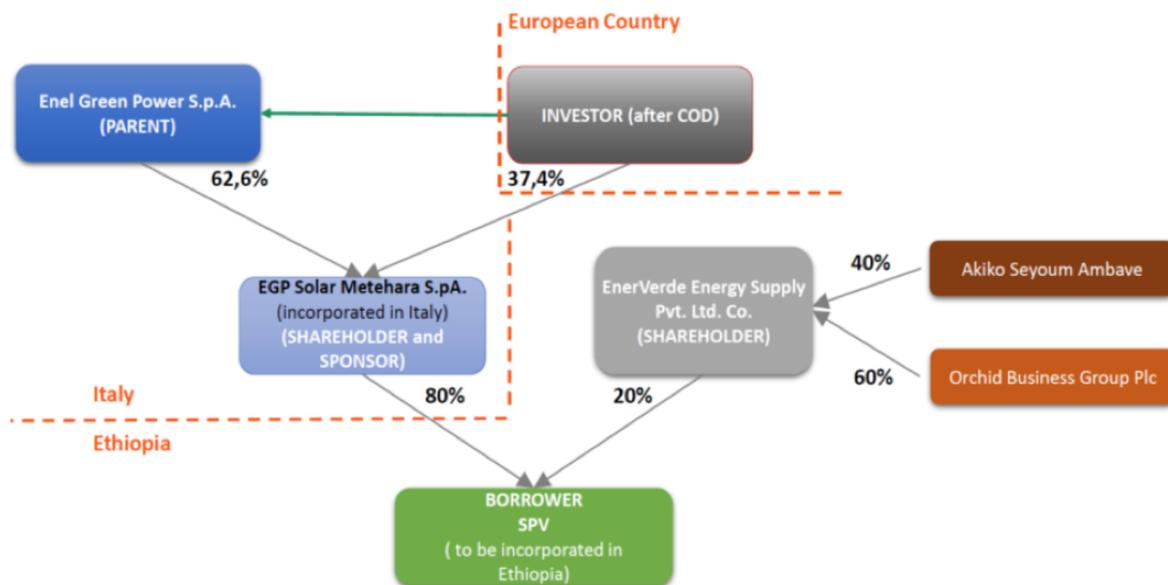


Figure 4: Shareholding structure of the Metehara solar PV project

Source: World Bank 2019a

The significant delays in finalising project agreements appears to have made reaching financial close increasingly difficult given the recently announced tariffs for the “Scaling Solar” projects. This problem is not necessarily unique to Ethiopia. The rapidly falling costs of renewable energy, and especially solar PV, mean that most subsequent procurement rounds will likely secure increasingly (and often dramatically) lower tariffs which then cast existing awards in a poorer light. Ethiopia’s honouring of this award is nonetheless important, in particular because it powerfully signals to the market the country’s commitment to fulfil its agreements, which is essential for securing and building trust.

Both Scaling Solar projects were awarded to ACWA Power from Saudi Arabia. The company has more than 30 GW of power assets in operation in 11 countries, including the UAE, Vietnam and Turkey. In Africa it also owns five projects in Morocco (one wind, one solar PV, and three CSP), three projects in Egypt (three solar PV and one CCGT), and three projects in South Africa (two CSP and one coal – the latter struggling to reach financial close). ACWA recently (October 2019) submitted the world’s lowest tariff for a solar PV project in Dubai, at US\$ 1,7/kWh (Bellini, 2019). Its submitted tariff in Ethiopia was equally record-breaking for the continent at US\$ 2,5/kWh.

The awarding of the two Scaling Solar projects has been controversial, not only because both projects went to the same bidder – in contrast to what the RfP appears to have intended – but mainly because ACWA was the only bidder that was not disqualified. As part of the RfP package – and in line with the Scaling Solar approach in Senegal and Zambia – the IFC offered stapled debt finance term sheets. The structure of the financing package was aimed at providing further incentive for tariff reduction. IFC offered bidders term sheets for A loan with a 17 year tenor. The loan interest rate was linked to the proposed tariff. For example if the proposed tariff was below US\$ 5/kWh, the tariff would be 325-375 bps above LIBOR; for tariffs between US\$ 5-6/kWh, interest would be charged at 325-375 bps above LIBOR; and between US\$ 6-7/kWh, the interest rate would be 400-425 bps/kWh. This A loan could only cover a maximum 25% of the total project cost, up to a maximum US\$35 million per project. IFC would furthermore arrange a blended finance loan if the proposed tariff was below US\$ 5/kWh, on the same terms and same maximum amount as the A loan, at a highly concessional rate of

LIBOR+115 bps. A third, equivalent tranche of debt would need to be arranged by the bidder. All companies that submitted bids – with the exception of ACWA Power – decided to make use of this very concessional financing package. When the IFC withdrew their commitment to provide financing one day before the submission deadline, these bidders were unable to provide credit-committee approved term sheets, which was a key qualification requirement.

ACWA Power decided not to make use of the IFC’s loan package, instead bidding with a loan package from the Bank of China. Post-award, ACWA has apparently been in discussions with the likes of the African Development Bank (AfDB), Bank of China, and various Saudi funds to finalise the loan terms. Financial close is supposed to be reached within six months from commercial close (expected in Q1 2020), and more details about the ultimate financiers should then be more readily available. Suffice to say that if this project reaches financial close in the next few months, it will also have set a powerful precedent for all subsequent power project investment in the country. Failure to reach financial close will send an equally powerful signal.

The Scaling Solar award tells two stories: the first is about the importance of building and retaining the trust of the market. Ethiopia’s and its implementing partners’ fumbling of key bankability provisions and procurement processes has damaged the market’s confidence. This might well mean that any subsequent bidding rounds will see depressed bidder interest, because bidders simply do not trust the process and/or the auctioneer. It might also mean that any subsequent power sector investments will either fail to attract sufficient debt finance, and/or will price in the risk created by this uncertainty. On the other hand, Ethiopia can point to the ACWA Power project as evidence of the fact that it simply does not need to “jump through all the international lender hoops”. If realised with its submitted financial package, this project would not only be the lowest solar PV tariff on the continent, but it will also be one of the first instances of significant Chinese funding for a (non-Chinese) IPP in sub-Saharan Africa. Given China’s prominent role in the continent’s power sector (Eberhard *et al.*, 2016a), and especially in the Ethiopian economy, this could represent an attractive and viable alternative option to the traditional “Western” project-financed IPP model.

6 Learning from Ethiopia

The paucity of Ethiopian private power investments powerfully illustrates the importance of the contributing elements of success for IPPs at the country, project and programme levels. To be fair, at the time of writing the recently announced Scaling Solar/ACWA Power award is still some time away from needing to reach financial close. But the ostensibly disordered procurement process and struggle of the already awarded projects to reach this critical milestone, shows just how difficult it will be to get Ethiopia's critical first IPP up and running. If any of the awarded IPPs – whether competitively procured or directly negotiated – manage to reach financial close in the next few months, this will represent a watershed moment that will hopefully usher in a new era for the country's power sector. In the absence of such a development at present, this report's analysis is focused on what has gone before, and what could be done to accelerate the realisation of IPP investment outcomes in Ethiopia.

At the country level, Ethiopia's far-reaching economic and political reform programme is both opening up the country to foreign investment, and potentially making it more difficult to realise this investment – at least in the short-term. This is due to the disorienting influence that these reforms appear to be having on players in both the public and private sector. Old institutions are being reconfigured while new institutions are established, in both cases leading to a lack of co-ordination, poor communication, and slow decision-making. The passage of new PPP legislation and the recent establishment of a PPP board and directorate general are encouraging signs for the private sector, but this has also delayed key project development decisions.

At the project level, the key and, as yet, seemingly unresolved issue, is the allocation and mitigation of foreign exchange risk. The country's inability or unwillingness to provide the kind of guarantees that would offer sufficient comfort to most international lenders and investors will limit its private sector-led energy ambitions. Ethiopia's auctions have attracted some of the biggest power project sponsors in the world at spectacular prices, but these projects still require substantial debt to be realised. The Bank of China's potential debt provision to the ACWA Power project represents an interesting and potentially ground-breaking departure from the status quo that could open a new frontier in financing for IPPs on the continent. At this stage though, long-term debt providers – whether commercial banks, institutional investors, DFIs or Chinese banks – have seemingly still been unable to convince their credit committees that Ethiopian IPPs are bankable.

At a programme level, the Ethiopian auction programmes distinctly illustrate the importance of getting the basics right. Project site selection and preparation remains a key challenge for African auction programmes, with Ethiopia's Metehara project serving as yet another reminder of this fact. More than anything though, the Ethiopian auctions have shown that auction implementation really matters. The lack of co-ordination among key decision-makers, the at times poor communication with the private sector, and the uncertainties created by the reform process have all eroded trust in the programmes and implementing institutions. The longer awarded projects take to reach financial close – a key trust milestone – the more this trust deficit will widen.

Despite these challenges, the future looks bright for Ethiopia's power sector. Its impressive economic growth story looks set to be powered by cheap renewable energy, making the country a global, African standard bearer for a new model of development. Its reform programme and private-sector investment ambitions has strong support from the international community. It now needs to follow through on existing project commitments before embarking on further

procurement rounds. Failure to do so will likely decrease bidder interest, leading to less competition, higher prices, and potentially lower quality bids. The absence of a proven path to financial close and commercial operation for private power projects means that even if new bids are awarded, there is no guarantee that these projects will be built on time or at all.

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 IPP projects. In particular, they have emphasised the importance of competitive procurement (Eberhard *et al.*, 2016b) 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.*, 2016b).

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 (Linares, 2011; Lucas, Ferroukhi and Hawila, 2013; Del Río and Linares, 2014; Kreiss, Ehrhart and Haufe, 2016; del Río, 2017; Lucas, Del Rio and Sokona, 2017; Dobrotkova, Surana and Audinet, 2018; Hochberg, 2018; 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 9: 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, and so on) 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, and so on.
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 returns on investment 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
--	---

Source: Adapted from Eberhard *et al.* (2016)

Appendix B

Participating tenderers: Metehara Solar PV

Participating tenderers (65)

- NA

Prequalified tenderers (5)

- ENEL Green Power
- Building Energy
- Meridiam | Solairedirect
- Fotowatio Renewable Ventures
- CCE Oasis Technology Corporation

Participating tenderers: Scaling Solar I

Participating tenderers (130)

- NA

Pre-qualified tenderers (12)

- Access | Total Eren Consortium
- Acciona | Swicorp Consortium
- Actis | Mulilo Consortium
- ACWA Power
- Al-Nowais | Aldwych | Alten Consortium
- EDF | Masdar Consortium
- ENEL Green Power
- FRV | Globeleq | Belayab Consortium
- KOSPO | KEPCO E&C Consortium
- Mitsui
- Nareva | Adani Consortium
- Scatec Solar

Prequalified tenderers: Scaling Solar II

- RfQ is presently been finalised.

References

- AfDB (2019) *Africa Economic Outlook Africa Economic Outlook*.
- Africa Energy (2019) *Africa Energy Database*.
- All Africa (2019) *Ethiopia: Grand Ethiopian Renaissance Dam (GERD) in Eight Years*.
- Badwaza, Y. (2018) *Reform in Ethiopia: Turning Promise into Progress*, Freedom House.
- BBC (2018) ‘Why has Ethiopia imposed a state of emergency?’, *BBC*, 21 February. Available at: <https://www.bbc.com/news/world-africa-43113770>.
- Bellini, E. (2019) ‘Dubai confirms Saudi’s ACWA won 900 MW solar project tender with \$ 0.016953/kWh bid’, *PV Magazine International*, November, pp. 1–5.
- Beyene, G. (2018) *The Challenges and Prospects of Electricity Access in Ethiopia*. doi: 123456789/7919.
- Dobrotkova, Z., Surana, K. and Audinet, P. (2018) ‘The price of solar energy : Comparing competitive auctions for utility-scale solar PV in developing countries ☆’, *Energy Policy*. Elsevier Ltd, 118(January), pp. 133–148. doi: 10.1016/j.enpol.2018.03.036.
- Eberhard, A. et al. (2016a) *Independent Power Projects in Sub-Saharan Africa: Lessons from Five Key Countries, Directions in Development - Energy and Mining*. Washington DC: The World Bank Group. doi: doi:10.1596/978-1-4648-0800-5.
- Eberhard, A. et al. (2016b) *Independent Power Projects in Sub-Saharan Africa: Lessons from Five Key Countries, Directions in Development - Energy and Mining*. doi: doi:10.1596/978-1-4648-0800-5.
- Eberhard, A. et al. (2017) ‘Independent Power Projects in Sub-Saharan Africa: Investment trends and policy lessons’, *Energy Policy*, 108, pp. 390–424. doi: 10.1016/j.enpol.2017.05.023.
- Eberhard, A. et al. (2019) *Revisiting Reforms in the Power Sector in Africa*.
- Eberhard, A. and Gratwick, K. N. (2011) ‘IPPs in Sub-Saharan Africa: Determinants of success’, *Energy Policy*, 39(9), pp. 5541–5549. doi: 10.1016/j.enpol.2011.05.004.
- Eberhard, A., Kolker, J. and Leigland, J. (2014) ‘South Africa’s Renewable Energy IPP Procurement Program: Success Factors and Lessons’, *PPIAF, Washington DC, USA*, (May), pp. 1–56. Available at: <http://www.ee.co.za/article/south-africas-reipp-programme-success-factors-lessons.html>.
- Eberhard, A. and Naude, R. (2016) ‘The South African Renewable Energy Independent Power Producers Procurement Programme (REIPPPP) – Lessons Learned’, *Journal of Energy in Southern Africa*, 27(4), pp. 1–14. doi: <http://dx.doi.org/10.17159/2413-3051/2016/v27i4a1483>.
- EEP (2014) ‘Reppie Waste-to-Energy Facility’.
- FDRE (2018) ‘Public Private Partnership Proclamation No. 1076/2018’.
- Fox, J. (2019) ‘Ethiopia and the Chinese dream in Africa’, *RTE*, 23 April.
- GCR (2019) ‘China agrees to invest \$1.8bn in Ethiopia’s power grid’, *Global Construction Review*, 29 April. Available at: <http://www.globalconstructionreview.com/news/china-agrees-invest-18bn-ethiopias-power-grid/>.
- Gordon, E. (2018) *The Politics of Renewable Energy in East Africa*. EL 29. Oxford.

- Hamilton, J. (2019) ‘Confusion over Scaling Solar outcome continues’, *African Energy Newsletter*, November.
- Hochberg, M. (2018) *Renewable Auction Design in Theory and Practice : Lessons from the Experiences of Brazil and Mexico*.
- HRW (2018) *Ethiopia: Events of 2018*, Human Rights Watch.
- IEA (2017a) *Growth and Transformation Plan (GTP) 2011-2015*.
- IEA (2017b) *Growth and Transformation Plan II (GTP II) 2016-2020*.
- Kreiss, J., Ehrhart, K.-M. and Haufe, M.-C. (2016) ‘Appropriate design of auctions for renewable energy support – Prequalifications and penalties’, *Energy Policy*. doi: 10.1016/j.enpol.2016.11.007.
- Kruger, W. and Eberhard, A. (2018) ‘Renewable energy auctions in sub-Saharan Africa: Comparing the South African, Ugandan, and Zambian Programs’, *Wiley Interdisciplinary Reviews: Energy and Environment*, (February), pp. 1–13. doi: 10.1002/wene.295.
- Kruger, W., Stritzke, S. and Trotter, P. A. (2019) ‘De-risking solar auctions in sub-Saharan Africa – A comparison of site selection strategies in South Africa and Zambia’, *Renewable and Sustainable Energy Reviews*, pp. 429–438. doi: 10.1016/j.rser.2019.01.041.
- Leigland, J. and Eberhard, A. (2017) ‘Localisation barriers to trade: the case of South Africa’s Renewable Energy Independent Power Program’, *Development Southern Africa*, Forthcomin.
- Linares, P. (2011) ‘Auctions for renewable energy support, back to the future?’, *Economic challenges for energy*, pp. 1–28.
- Lucas, H., Ferroukhi, R. and Hawila, D. (2013) *Renewable Energy Auctions in Developing Countries*. Abu Dhabi.
- Lucas, H., Del Rio, P. and Sokona, M. Y. (2017) ‘Design and Assessment of Renewable Electricity Auctions in Sub-Saharan Africa’, *IDS Bulletin*, 48(5), pp. 79–100.
- Mills, G. (2018) ‘Demography and Democratic Yearnings – an interview with Ethiopian Prime Minister Abiy Ahmed Ali’, *Daily Maverick*, 16 October.
- Multiconsult (2019) *Metehara Solar Power PV Plant: Environmental and Social Impact Assessment*.
- Norton Rose Fulbrigt (2016) *Investing in the Ethiopia electricity sector, Inside Africa*. Available at: <https://www.insideafricalaw.com/publications/ethiopia-investing-in-the-african-electricity-sector-ten-things-to-know>.
- Perera, A. (2018) ‘Electricity in Ethiopia’, (June).
- Power Africa (2018) *Ethiopia: Power Africa Fact Sheet*.
- del Río, P. (2017) ‘Designing auctions for renewable electricity support. Best practices from around the world’, *Energy for Sustainable Development*, 41, pp. 1–13. doi: 10.1016/j.esd.2017.05.006.
- Del Río, P. and Linares, P. (2014) ‘Back to the future? Rethinking auctions for renewable electricity support’, *Renewable and Sustainable Energy Reviews*. Elsevier, 35, pp. 42–56. doi: 10.1016/j.rser.2014.03.039.
- RMB (2017) ‘Where to Invest in Africa 2017/2018’.
- Schwab, K. (2014) *The Global Competitiveness Report 2014-2015*, *Foreign Affairs*. doi: 10.2307/20033186.

Shanko, M. (2002) *Overview of the Electricity Sector in Relation to Public Private Partnerships in Ethiopia*.

The World Bank Group (2019) *Ethiopia kicks off scaling solar round 2*.

Trimble, C. *et al.* (2016) 'Financial Viability of Electricity Sectors in sub-Saharan Africa. Quasi-fiscal Deficits and Hidden Costs', *Policy Research Working Paper 7788*. World Bank, (August). Available at: <https://openknowledge.worldbank.org/handle/10986/24869>.

Water Technology (2014) *Grand Ethiopian Renaissance Dam Project, Benishangul-Gumuz*. Available at: <https://www.water-technology.net/projects/grand-ethiopian-renaissance-dam-africa/>.

World Bank (2016) *Ethiopia: Priorities for ending extreme poverty and promoting shared prosperity. Systematic country diagnostic*.

World Bank Group (2017) *The World Bank In Ethiopia*.

World Bank Group (2018a) *Debt Sustainability Analysis (DSA)*.

World Bank Group (2018b) *International Development Association Program Appraisal Document on a Proposed Regular Credit in the amount of SDR 176.9 Million (US\$250 Million equivalent) and a Proposed Scale-Up Facility Credit in the amount of US\$125 Million to the Federal Democratic Republic of Ethiopia*. Available at: <http://documents.worldbank.org/curated/en/686501520132423023/pdf/ETHIOPIA-PAD-02092018.pdf>.

World Bank Group (2018c) *Senegal achieves remarkable 3.8¢ tariff with scaling solar*.

World Bank Group (2019) *Renewable Energy Guarantees Program (REGREP) Project Documents*.