Driving Growth: Effective Renewable Energy Tendering in Africa

Success Factors for Private Power Investment and Procurement

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Transforming Energy Sectors Globally

SRMI Sustainable Renewables Risk Mitigation Initiative

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Sustainable Renewables Risk Mitigation Initiative (SRMI)

Launched in 2018, the Sustainable Renewables Risk Mitigation Initiative (SRMI) is a multilateral partnership which aims to help Emerging Markets and Developing Countries (EMDCs) develop their renewable energy sectors by attracting private investments and enabling socioeconomic benefits through targeted infrastructure. Partners include the ESMAP at the World Bank, Agence Française de Développement (AFD), the International Renewable Energy Agency (IRENA), the International Solar Alliance (ISA), Sustainable Energy for All (SEforALL) (joining in 2021) and the African Development Bank (AfDB), the Asian Development Bank (ADB), the European Bank for Reconstruction and Development (EBRD), and GET.transform joining in 2023. esmap.org/srmi

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Lastly, we thank every energy sector player who will explore, adapt and ultimately apply these findings to engender further progress on Africa's path to a prosperous energy future.

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Frequently-used Acronyms

ADEREE	Agency for the Development of Renewable Energies and Energy Efficiency
ANRE	Agence Nationale de Régulation de l'Energie
B-BBEE	Broad-Based Black Economic Empowerment
BERA	Botswana Energy Regulatory Authority
BESI4P	Battery Energy Storage Independent Power Producer Procurement Programme
BOO	Build-Own-Operate
BPC	Botswana Power Corporation
BW	Bid Window
CEB	Central Electricity Board
COD	Commercial operation date
CSP	Concentrated Solar Power
DFI	Development Finance Institution
DMRE	Department of Mineral Resources and Energy
DN	Direct Negotiations
DoE	Department of Energy
EEA	Ethiopian Energy Authority
ED/SED	Socio-(Economic) Development
EEP	Ethiopian Electric Power
EOI	Expression of Interest
FiT	Feed-in-Tariff
GW	Gigawatt
IA	Implementation Agreement
IPP	Independent Power Producers
ICB	International Competitive Bidding
kWh	Kilowatt (hour)
MASEN	Moroccan Agency for Sustainable Energy
MEPU	Ministry of Public Utilities
MIGA	Multilateral Investment Guarantee Agency
MMGE	Ministry of Mineral Resources, Green Technology and Energy Security
MoWIE	Ministry of Water, Irrigation and Energy
MW	Megawatt (hour)
NERSA	National Energy Regulator of South Africa
ONEE	Office National d'Electricité
PPA	Power Purchase Agreement
PPP	Public-Private Partnership
PRG	Partial Risk Guarantee
PV	Photovoltaic
REFiT	Renewable Energy Feed-In Tariff
REI4P	Renewable Energy Independent Power Producers Procurement Programme
RFP	Request for Proposal
RFQ	Request for Qualification
RMI4P	Risk Mitigation Independent Power Programme
SP-I4P	Small Projects Independent Power Producer Procurement Programme
SSA	Sub-Saharan Africa
US$	United States (Dollar)
URA	Utilities Regulatory Authority

Foreword

Energy plays a vital role in realising Africa's prosperous future as described in Agenda 2063, the plan from the African Union to achieve inclusive and sustainable socio-economic development in the next 50 years.

Ensuring universal and sustainable energy access will be an important lever for further priority goals concerning economic growth and job creation, education, health and climate-resilience. Despite decreasing technology cost and abundant natural renewable resources, however, Africa's clean energy potential remains largely untapped.

Successful power sector transformations cannot be delivered through public finance alone. A greater involvement of the private sector is required to unlock new levels of finance and enable the development of more renewable energy projects at small and large scale. Mobilising private sector investment, however, is dependent on bankable and robust regulation that provides investment security while promoting viable business models.

With this report, critical knowledge is shared on a powerful regulatory mechanism: renewable energy auctions. They have proven a particularly potent tool in procuring Independent Power Producers (IPPs), which are renewable energy projects that are constructed and managed by the private sector. IPPs have emerged as a principal avenue for investment in Africa's electricity sector today. If designed effectively, auctions cannot only help to accelerate the roll-out of IPPs but also foster competition and improve project implementation rates.

The report delves into the design and execution of renewable energy auctions, examining the intricate interplay between national policies, programme design, and project-specific variables that are crucial for the successful deployment of private power projects.

We are excited to announce that the generated insights on best practices and success factors are not only shared through this report but have actively informed the design of a new support window under GET.transform's Policy Catalyst. Together with the Sustainable Risk Mitigation Initiative (SRMI) of the World Bank's ESMAP programme and in partnership with the lead authors of this report, the Power Futures Lab, GET.transform has developed a comprehensive window to enhance IPP procurement capabilities in Sub-Saharan Africa. The "Effective Renewable Energy Tendering" window addresses officials from finance and energy ministries, public utilities and regulators to help them position their jurisdiction at the leading edge of renewable energy investment and innovation.

Convinced that efficient renewable energy auction schemes have a role to play in shaping the continent's future energy landscape, we are certain that they provide African nations with powerful means to simultaneously address energy security, sustainable growth and climate change mitigation.

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Executive Summary

Access to reliable, affordable, and clean energy is a linchpin for Africa's economic growth, improved living standards, and sustainable development aspirations. Yet, despite the continent's rich energy potential, a stark reality persists: energy poverty remains a pervasive challenge. Millions of Africans continue to live without access to electricity, hindering their ability to meet basic needs, pursue education, engage in productive work, and access critical healthcare services. The financing requirements of the power sector surpass the limited resources of many countries' public finances, which were historically the primary means of investment in power generation. Today, Independent Power Projects (IPPs), financed, built, owned, and operated by the private sector, have become one of the main sources of investment in Africa's electricity sector. In the same vein, the continent's renewable energy sector has recently witnessed substantial growth, driven by the expanding role of these privately-funded projects, declining technology costs, environmental imperatives, favourable policies and market incentives, and a growing rural and urban demand.

The procurement mechanism employed in contracting IPPs have proven to be a key contributing factor in determining their successful realisation. Amongst these methods, auctions have emerged as a powerful tool for accelerating the deployment of renewable energy projects, fostering competition and enhancing project realisation rates. With African countries looking to address the double challenge of energy security and climate change, the design and implementation of effective renewable energy auction programmes have become a critical aspect of shaping the energy landscape for the future. To this end, this report analyses the design and implementation of renewable energy auctions, exploring the complex interaction between country-level policies, programme design and project-specific factors for successful private power project deployment.

Analytical Framework

The report's analytical framework combines insights from IPP success factors and studies on auction design and implementation to offer a comprehensive understanding of the factors influencing auction outcomes.

IPP Success Factors

The factors contributing to the success of IPPs in Africa can be categorised into country, programme, and project-levels.

Country-level factors

- **Stability of economic and legal context:** Ensuring economic stability, enforceable contracts, and fair arbitration.
- **Energy policy framework:** Establishing a clear legal framework for private sector involvement.
- **Reform-minded leadership:** Appointing individuals committed to long-term energy sector development.
- **Regulatory transparency:** Implementing transparent licencing and tariff structures.
- **Coherent sectoral planning:** Clearly defining planning roles and fairly allocating development opportunities.
- **Competitive bidding practices:** Linking planning to timely initiation of competitive tenders that are adequately resourced, fair, and transparent.

Programme-level factors

- **Programme design:** Restricting participation to capable companies, ensuring bankable contracts, and balancing competition and investment risks.
- **Programme implementation:** Garnering political support, having a capable procuring entity, effective government co-ordination, and a transparent procurement process.

Project-level factors

- **Favourable equity partners:** Encouraging local capital contributions, experienced and risk-tolerant partners, and potential involvement of development finance institutions.
- **Favourable debt arrangements:** Competitive financing, mitigating foreign-exchange risk, and matching risk premiums to country/project risk.
- **Creditworthy off-taker:** Ensuring managerial capacity, efficient operations, low technical losses, and sound customer service.
- **Secure and adequate revenue stream:** Establishing robust Power Purchase Agreements (PPA) and security arrangements when necessary.
- **Credit enhancements and risk management:** Employing sovereign guarantees, political risk insurance, partial risk guarantees, letters of credit, international arbitration, and other measures to mitigate risk.
- **Positive technical performance:** Maintaining efficient technical performance and anticipating and mitigating potential conflicts.
- **Strategic management and relationship-building:** Building a positive image in the country through political relationships, development funds, effective communications, and contract management during exogenous shocks and other stresses.

Auction Design & Implementation

To deepen understanding of the programme-level factors for IPP success in the context of auctions, the analytical framework investigates key programme design decisions and implementation considerations.

Auction design

- **Project-Site Selection:** Deciding whether the government or project developers select the project-site, impacting upon resource availability, environmental and social impact, as well as grid stability and transmission costs.
- **Auction Demand:** Determining how much is procured, dividing it among technologies, bidders, regions, projects, and time periods.
- **Qualification and Compliance Requirements:** Ensuring projects adhere to international standards, site-readiness, environmental, social performance, and local economic development criteria.
- **Winner Selection Process:** Defining bidding procedures and criteria for selecting auction winners.
- **Seller and Buyer Liabilities:** Addressing bid bonds, contract schedules, remuneration profiles, penalties for underperformance, and transmission delay liabilities.
- **Bankability and Risk Mitigation:** Offering standardised, non-negotiable contracts, credit enhancements, and payment security measures for attracting international financing.

Auction implementation

- **Enabling Environment:** Ensuring high-level political support, capable auctioneers, and supportive policy and planning frameworks.
- **Resource Allocation:** Allocating adequate resources for the auction process, potentially offset by cost savings from low prices.
- **Grid Planning Co-ordination:** Aligning the auction programme with the demands of the grid and system operator.
- **Fairness, Transparency, and Trust:** Maintaining a commitment to fairness, transparency, and trust during the implementation process.

Case-Study Countries

Five case-study countries – South Africa, Mauritius, Botswana, Ethiopia, and Morocco – have been strategically selected for in-depth analysis using the analytical framework. Their selection aims to provide a better understanding of the successes and challenges associated with designing and implementing renewable energy auctions within diverse contexts. Each country was chosen for specific reasons that collectively provide a well-rounded perspective on the spectrum of experiences in the African renewable energy development and auction programmes.

- **South Africa:** South Africa's inclusion stems from its status as an initial regional and global trailblazer in renewable energy auctions. It serves as a prime example of how policy certainty, co-ordinated investment strategies, comprehensive planning, and a capable procurer can attract substantial renewable energy investments. Additionally, South Africa's later setbacks provide critical lessons on the repercussions of deviating from the contributing elements for IPP success.
- **Mauritius:** Mauritius was selected as a case-study due to its remarkable success within a smaller power system. It demonstrates the effectiveness of clear policy objectives, transparent auction procedures, and a reliable power purchaser in achieving renewable energy goals, showcasing a model for smaller economies.
- **Botswana:** Botswana's inclusion underlines the need for integrated approaches encompassing power planning, procurement, and investment frameworks. Despite abundant mineral resources, a stable political environment, and a favourable investment climate, Botswana's sole auction success hinged on the implementation of a dedicated, well-resourced procurement programme.
- **Ethiopia:** Ethiopia's presence in the study highlights the significance of clear leadership along with political will. Beyond expressing a commitment to renewable energy, Ethiopia's experiences emphasise the importance of well-mandated and co-ordinated leadership to translate ambitions into concrete investments.
- **Morocco:** Morocco's inclusion offers insights into how North African countries, with unique socio-political and economic realities, can successfully expand their renewable energy capacities through the implementation of competitive auctions. The lessons from Morocco also highlight the crucial roles played by political backing, power sector reforms, and support from the international community in achieving these objectives.

Key Findings

Drawing on research and empirical evidence from case-study countries and global best practice, the report provides valuable insights and findings for governments and policy-makers, as well as industry stakeholders and investors seeking to achieve sustainable and effective auction outcomes.

- **Government Commitment and Consistency:** Successful renewable energy auctions are often underpinned by strong government commitment and consistency in policy implementation. African nations, which provide clear and consistent regulatory frameworks, tend to attract more significant investments in renewable energy projects.
- **Private Sector Trust:** Building trust between governments and the private sector is essential to foster a conducive environment for private sector participation. Successful collaboration requires open communication, transparency, and a consistent and trustworthy regulatory framework.
- **Fostering Planning-Procurement Alignment:** Promoting a strong connection between energy planning and procurement ensures that tenders align with market dynamics and system needs and provide long-term market certainty.
- **Site Assessment:** The site assessment and selection processes are fundamental to the success of renewable energy auctions. Ignoring or underestimating their importance can impact upon project viability, leading to project delays, financial challenges, and potential project abandonment.
- **Grid Integration:** Grid infrastructure and integration play a pivotal role in the success of renewable energy auctions. African countries should prioritise grid expansion and modernisation to accommodate the growing share of renewable energy sources, ensuring efficient and reliable power distribution.
- **Procurer Capacity:** A credible and capable procurement agency plays a crucial role in overcoming implementation

challenges, thus contributing to successful auctions. This entity should effectively possess the necessary resources, expertise, and independence to effectively co-ordinate and administer the auctions.

- **Flexible Auction Design:** Effective auction design should be flexible and adaptable to evolving market conditions and project readiness. Continuous learning and stakeholder engagement enable auction programmes to refine their design and evaluation criteria for optimal outcomes.
- **Effective Co-ordination:** Effective co-ordination amongst decision-makers and institutions involved with implementing the auction is vital for programme success. Lack of co-ordination can result in significant delays or even stall the procurement process.
- **Role of Development Partners:** Development partners play a critical role in supporting the success of renewable energy auction programmes. Their assistance in key areas, such as policy strengthening, institutional capacity-building, and stakeholder engagement, can be instrumental in reducing financing cost and enhancing project's attractiveness to investors.
- **Government Support and Guarantees:** Investor concerns arise due to insufficient government support and the absence of sufficient credit enhancements, as well as other risk management and mitigation measures. Countries can still attract IPPs without such support or measures, but they must have some fundamentals in place, such as a stable political and macro-economic environment, and a credible and trustworthy off-taker. Unfortunately, most African countries lack these features.
- **Socio-economic Benefits:** Beyond clean and competitive energy supply, renewable energy auctions have the potential to deliver significant socio-economic benefits. Auctions can empower communities, stimulate job creation, and promote local economic development through targeted requirements in the tendering process. However, these measures, if adopted must be transparently implemented and continuously monitored to achieve their intended objectives of fostering inclusive economic development.

Recommendations

Based on a wealth of experiences and lessons learned, the report offers a set of targeted and actionable recommendations for stakeholders, including African governments and policy-makers. Key recommendations include:

- **Strengthening Policy and Regulatory Frameworks:** Governments should establish clear and stable policy and regulatory environments, along with IPP legislation, which defines the roles of private and public sectors and clarifies procurement procedures for the private sector. In addition, given the importance of public utilities as ultimate off-takers, continued support to ensure independent, capacitated regulators in setting cost-reflective tariffs should be a key priority.
- **Strengthen the Planning and Procurement Nexus:** Countries should provide regularly updated power sector expansion plans which project demand, select cost-effective technologies, and allocate new-build opportunities to private or state-owned entities. These plans should be translated into international competitive bidding rounds on a timely and regular basis, without requiring political approval to be effective.
- **Continuous Learning and Stakeholder Engagement:** Auctioneers should continuously assess and adjust their evaluation criteria based on market conditions, auction volumes, and the level of pipeline project readiness in the country. This approach would lead to more balanced and sustainable future auction outcomes.
- **Building Institutional Capacity:** Governments should invest in building the capacity of the implementing agency responsible for auction design and implementation. These agencies should have sufficient resources, expertise and independence to effectively co-ordinate and administer the auctions.
- **Pay the 'School Fees':** Designing and implementing a successful auction programme can be costly and time-consuming. Governments, and their development partners, should understand this before embarking on a programme, and should invest the necessary time and resources to ensure successful outcomes.
- **Build and Maintain the Market's Trust:** The procurement programme should be designed with transparent and clear rules, timelines and evaluation criteria. The implementing unit's roles and responsibilities should also be consistent so as to enhance private sector confidence in the procurement process.
- **Prioritising Lender Requirements:** Lenders' bankability requirements should be prioritised, as they are most

often the ultimate arbiters of project success. It is essential that they are involved early-on in the auction design process to review relevant contracts and documents, and scrutinise their viability against credit requirements.

To summarise, renewable energy auctions have shown promise in addressing Africa's power shortages, with success stories in various countries, such as South Africa, Morocco, Zambia, and Senegal. However, achieving success in these programmes requires substantial investment at the country, programme, and project-levels. This report aims to contribute to a better understanding of renewable energy auctions, and to promote the development of effective and sustainable IPPs across the continent. By learning from both IPP success factors and auction design best practices, African countries can make informed decisions on how to address their electricity access challenges, and accelerate the transition to renewable energy sources. Nevertheless, it is crucial to consider country contexts in applying these approaches, as there is no universally applicable formula that guarantees success. Each African nation presents its distinct challenges, opportunities, and socio-political dynamics, necessitating customised strategies that are founded on a deep understanding of the specific context.

01

INTRODUCTION

1.Introduction

Access to electricity remains a challenge in Africa. Over half of the continent's population lacks access to affordable and reliable electricity, constraining economic growth and human development (IEA, 2022). Electricity consumption per-capita is approximately 412 kWh per annum (US EIA, 2020), the lowest by region globally, and a fraction of the rates in most European nations (US EIA, 2019; World Bank, 2020c). Africa's installed generation capacity is just 240 GW (AEP, 2023; US EIA, 2017), around the same volume as a single European country, Germany (Enerdata, 2022). The bleakness of this situation is also apparent in the spread of power. In North Africa, 79% of the population has access to electricity, a significantly higher percentage compared to only 48% in Sub-Saharan Africa (SSA) (World Bank, 2020a). This disparity is also reflected in per-capita electricity consumption, with North Africa averaging 1,000 kWh per annum, while Sub-Saharan Africa lags behind at 350 kWh. Additionally, around half of the continent's installed generation capacity is found in two countries, namely Egypt and South Africa (PFL, 2023), with the remaining distributed among other nations. This is not to say that the growth in generation capacity has stagnated. Indeed, Africa's power sector has added more generation capacity in the last decade than in any other comparable period, as shown in Figure 1 (PFL, 2023). However, population growth, industrialisation, and urbanisation rates have meant that generation has not kept pace with demand (Dagnachew et al., 2023).

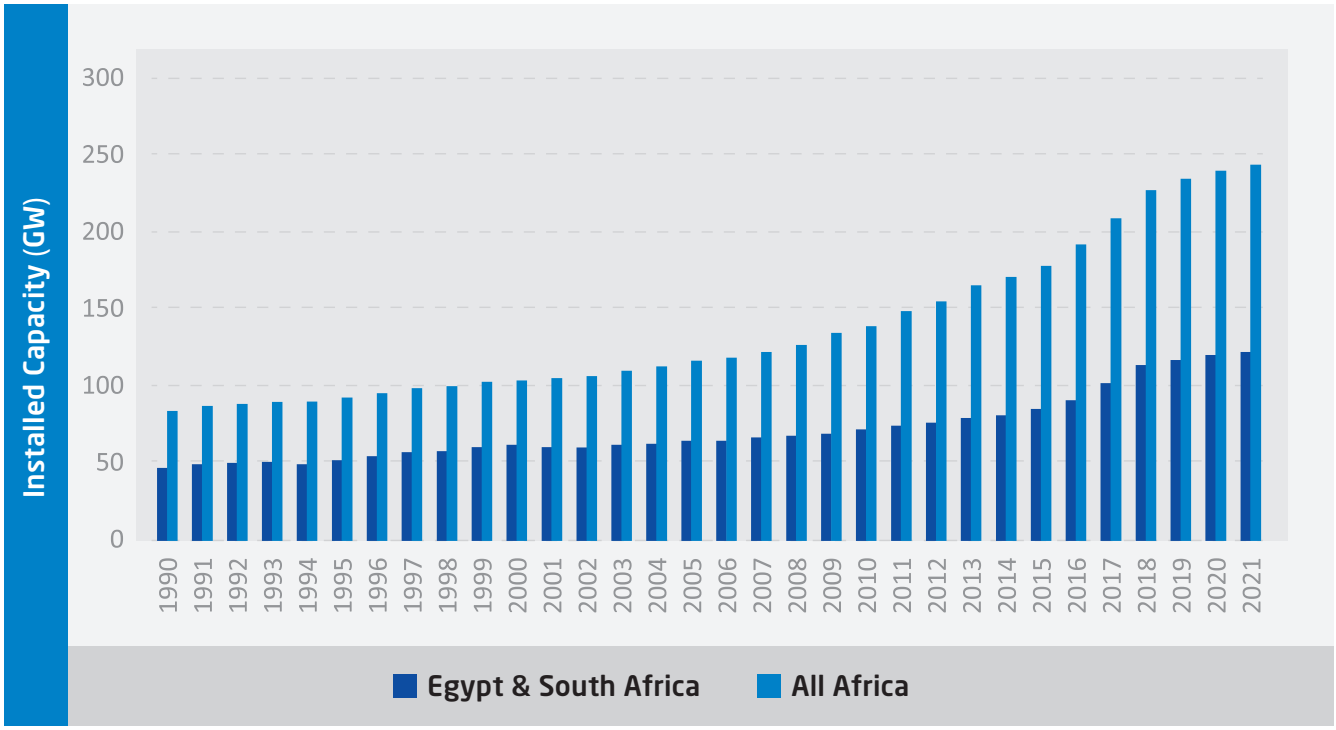

Figure 1: Annual installed generation capacity (GW) in Africa (1990 – 2021), considering new additions and retirements
Source: (Author's compilation)

Independent Power Producers (IPPs) – that is greenfield, grid-connected, non-backup, utility-scale (greater than 5 MW) generators which are developed, financed, constructed, majority-owned and operated by the private sector – remain among the fastest growing sources of investment in the region's power sector (Kruger et al., 2018a). In 1994, Côte d'Ivoire became the first African country to attract a foreign-led IPP to sell power to its network through a long-term Power Purchase Agreement (PPA) with the state utility. Since then, IPPs have gradually spread across the region (see Figure 2), and their share in total installed power generation capacity has, remarkably, increased year-on-year (see Figure 3) (PFL, 2023). Overall, 402 IPPs were financed, representing approximately 36 GW generation capacity and a US$ 69 billion total investment. However, IPP capacity is concentrated in a few countries (as shown in Figure 2), with only five nations boasting more than 2000 MW of installed capacity: South Africa (8680 MW), Egypt (5065 MW), Morocco (4721 MW), Ghana (2603 MW), and Nigeria (2101 MW) (PFL, 2023).

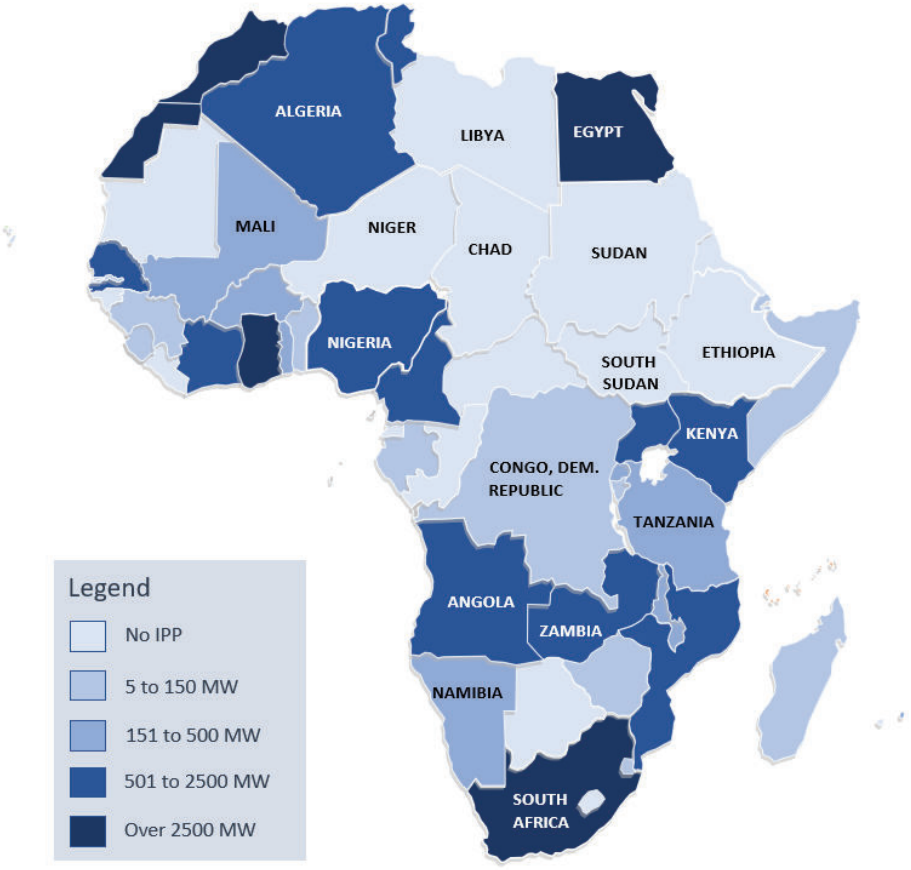

Figure 2: Generation Capacity (MW) of IPPs across Africa based on project financial close
Source: (PFL, 2023)

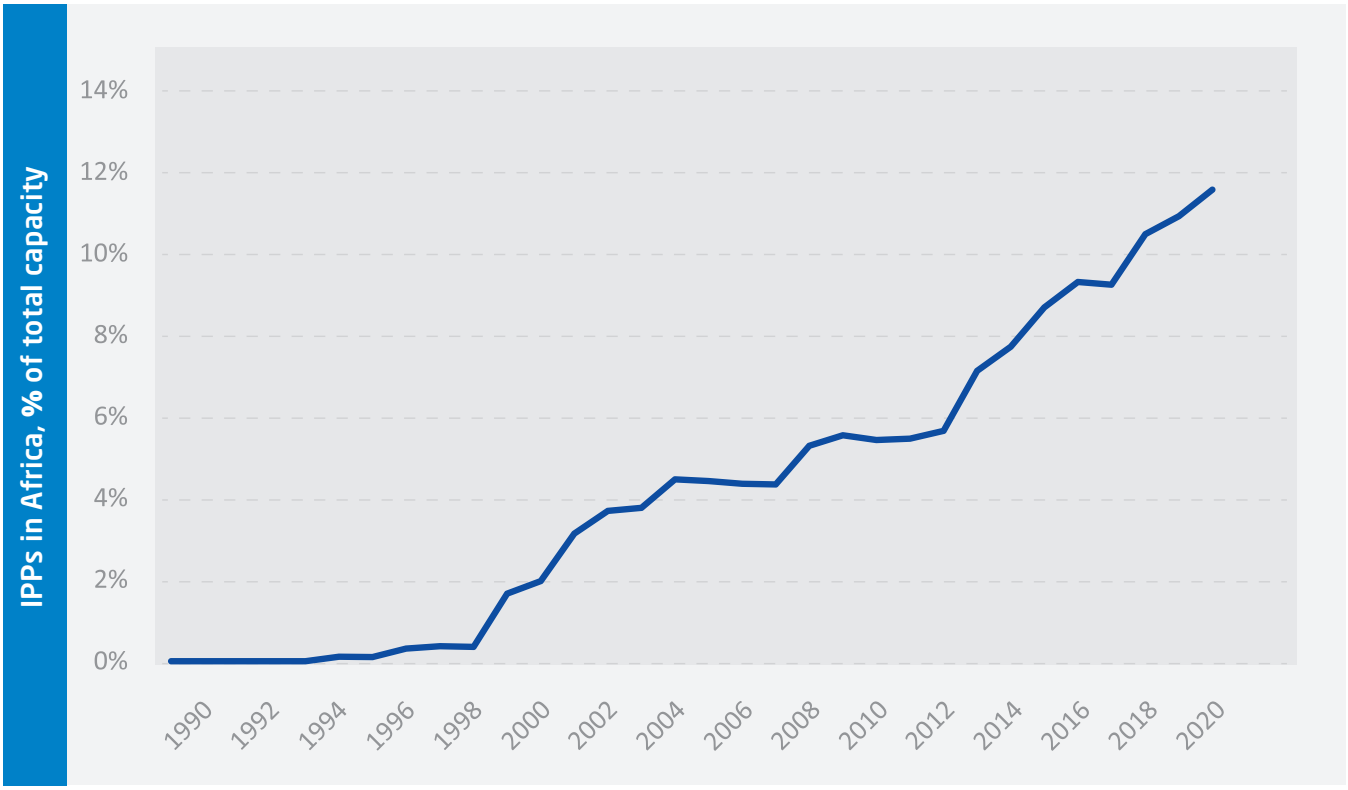

Figure 3: Share of IPPs in total installed generation capacity in Africa
Source: (PFL, 2023)

Before 2012, conventional units, such as gas turbines (OCGT and CCGT) and diesel/HFO, dominated the IPP technology mix (PFL, 2023). At this time, gas turbines alone represented 74% of the installed capacity. Since 2012, renewable energy projects (excluding hydropower IPPs, greater than 50 MW) have become more prominent, with these technologies comprising 61% of new capacity in the last decade, as seen in Figure 4.

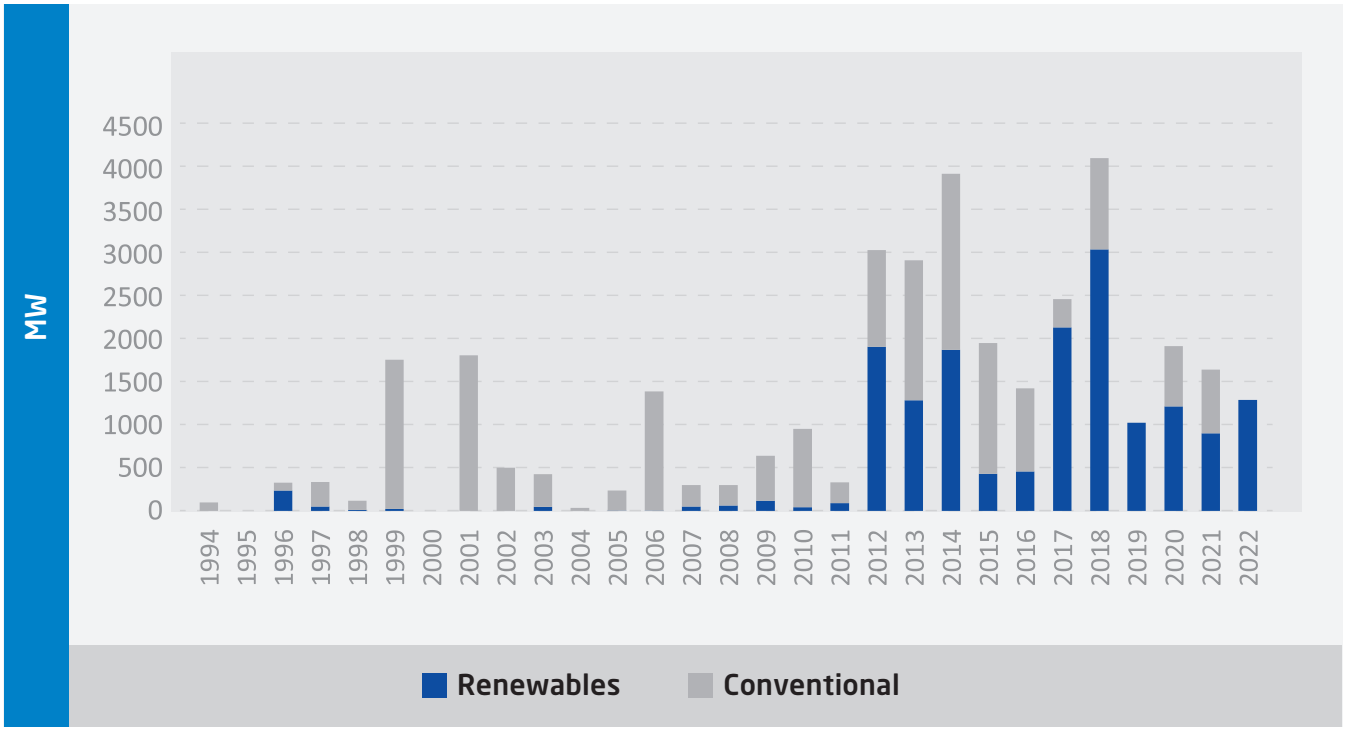

Figure 4: Annual installed generation capacity in Africa by year of financial close, Renewables vs Conventional
Source: (PFL, 2023)

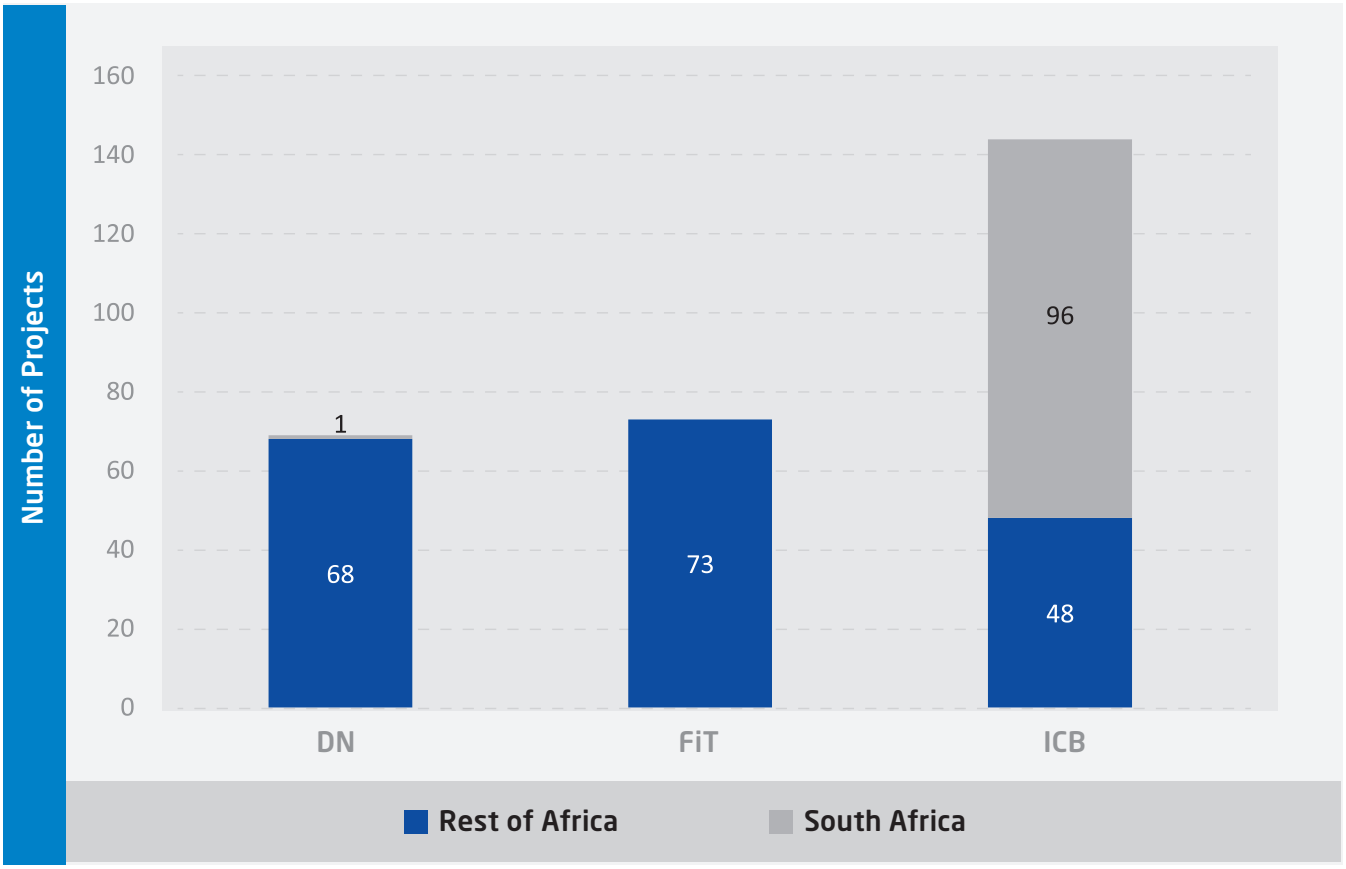

Figure 5: Procurement method of renewable energy IPPs in Africa between 1994 and 2022
Source: (PFL, 2023), NB: DN = Direct Negotiation, FIT = Feed-in-Tariff, ICB = International Competitive Bidding

Most renewable energy IPPs are solar-based and have mainly been procured through structured procurement programmes, such as internationally-competitive bidding or Feed-in-Tariff (FiT), although a substantial number have also been secured through unsolicited proposals/direct negotiations (DN), as shown in Figure 5 (see Appendix A: Private power procurement trends in Africa). Well-designed and co-ordinated structured procurement programmes, which are linked to a country's power plans, can result in transparent selection outcomes and systematically deliver large volumes of power promptly (Alao & Kruger, 2020). Countries that have employed these programmes are now reaping considerable benefits, mainly in terms of clean, reasonably priced energy which is wholly financed, built and operated by the private sector. Out of the top renewable IPP destinations in Africa, as presented in Figure 6, only Angola has not completed at least one structured contracting process dedicated to renewables.

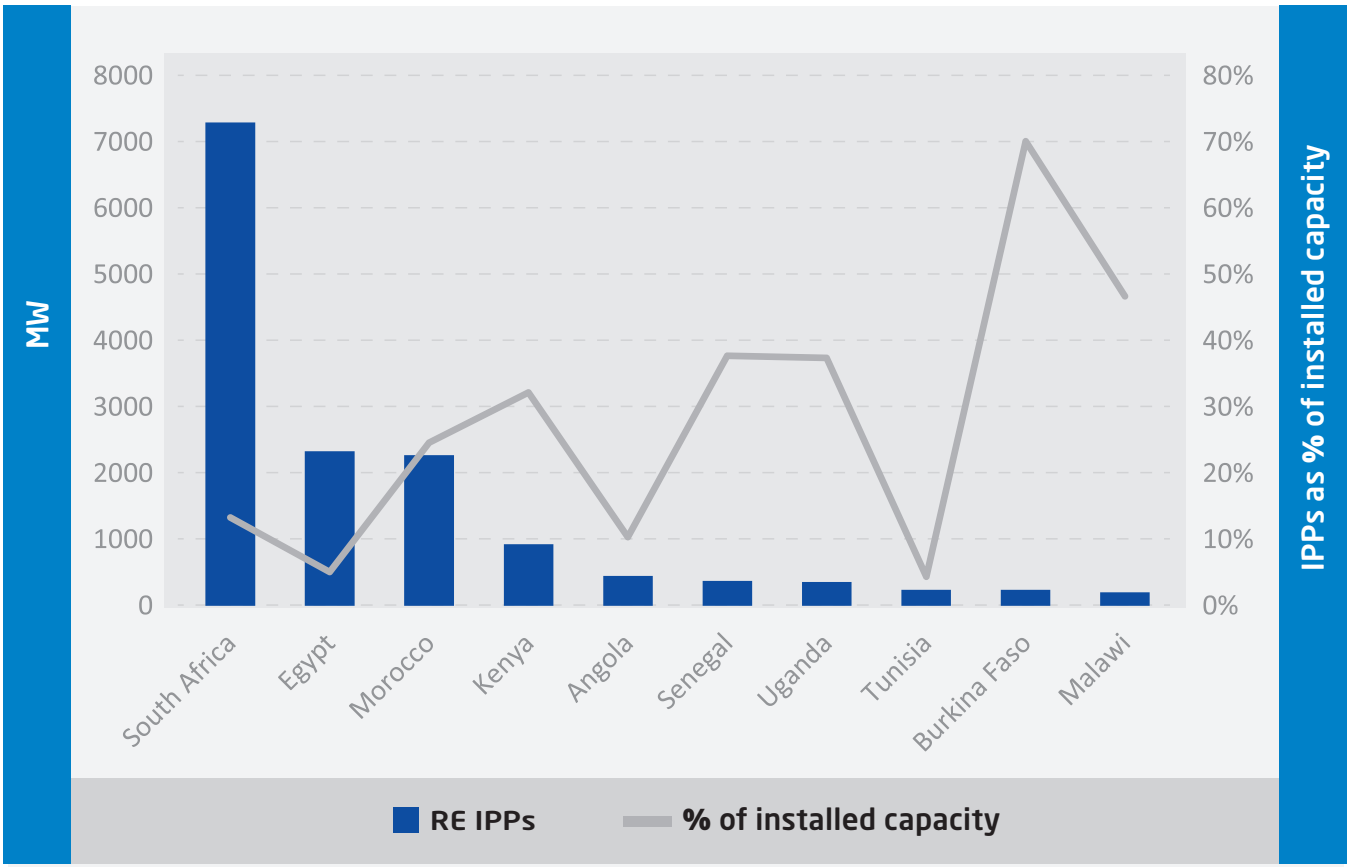

Figure 6: Top renewable energy IPP destinations in Africa
Source: (PFL, 2023)

Overall, the increase in IPP investment, the growth in competitively priced renewable energy projects and the use of structured procurement programmes have presented important departures from the status quo in Africa (AfDB, 2019b; Alao & Kruger, 2020; Kruger et al., 2018b). This report aims to support this transition by contributing to a better understanding of renewable energy auctions across the continent. It combines insights from the literature on IPP success factors, studies on auction design and implementation, as well as empirical evidence from case-study countries and global best practice, to provide a comprehensive understanding of the factors influencing auction outcomes.

The report is structured as follows: The rest of Chapter 1 focuses primarily on the study of private power investment in Africa, particularly the identification of success factors for IPPs. It also explores the growing field of renewable energy auctions, emphasising their adoption as a standard practice for procuring power supplies in many countries, including in Africa.

Chapter 2 discusses the analytical framework for assessing renewable energy auctions. It examines crucial aspects of auction design, including site selection, qualification and compliance requirements, winner selection process, and

risk mitigation. Additionally, the chapter explores the implementation of auctions, highlighting the significance of an enabling environment, political support, and the principles of fairness, transparency, and trust throughout the process.

Chapter 3 provides a comprehensive overview of the status and challenges of renewable energy auctions in Africa, noting the rapid expansion of these programmes across the continent. It also offers high-level regional insights. Finally, the chapter provides detailed analyses of five case-study countries: South Africa, Mauritius, Botswana, Ethiopia, and Morocco. These case-studies offer a comprehensive and balanced perspective on the successes and challenges of implementing renewable energy auctions across diverse contexts.

Chapter 4 provides a brief evaluation of the elements which proved successful, and those that fell short, in the context of the case-study countries. It subsequently details the lessons learned from the case-studies based on the contributing elements for the success of IPPs at the country, project, and programme-levels.

Chapter 5 further outlines recommendations for maximising the effectiveness of renewable energy auctions based on these success factors. It concludes the report with acknowledging the importance of carefully tailoring these approaches to address the unique challenges and opportunities of the host country.

02

Three-Level Analytical Framework:

Private Power Investment and Procurement in Africa

2.Three-Level Analytical Framework: Private Power Investment and Procurement in Africa

2.1 Factors Contributing to the Success of Independent Power Projects in Africa

Studies on private power investment in Sub-Saharan Africa have mainly concentrated on the identification of success factors for IPP development and implementation. Woodhouse (2005) and (Eberhard & Gratwick, 2013a, 2011, 2013b) have identified more than 40 success factors, in an emergent, bottom-up manner, through the use of comparative case-studies. While these IPP success factors have been empirically derived, they correspond to the risks, barriers and bankability requirements identified in the project finance, Public-Private Partnership (PPP), and infrastructure finance literature (Annamalai & Jain, 2013; Babbar & Schuster, 1998; Bonetti et al., 2010; Collier, 2014; Collier & Cust, 2015; Estache et al., 2015; Farrell, 2003; Grimsey & Lewis, 2002; Jamali, 2004; Pollio, 1998; Siemiatycki & Farooqi, 2012; Thobani, 1999).

These factors are grouped into five sub-categories at the country-level:

- Stable country context
- Clear policy framework
- Transparent, consistent and fair regulations
- Coherent power system planning
- Competitive bidding practices

They can also be grouped into seven sub-categories at the project-level:

- Favourable equity partners
- Favourable debt arrangements
- Creditworthy off-taker
- Secure and adequate revenue stream
- Credit enhancement and other risk management and mitigation measures
- Positive technical performance
- Strategic management and relationship-building

Furthermore, recent analyses of IPP investments in Africa by Eberhard et al., 2016a; Eberhard, Gratwick, Morella, et al., 2017; Eberhard, Gratwick, Morello, et al., 2017, have emphasised the importance of two country-level factors as critical for accelerating investment: least-cost power planning, as well as the timely initiation of competitive procurement for power generation. There is thus a need to extend IPP analysis to also include the programme-level.

A body of literature that is both useful and timely for informing IPP success factor analysis at the programme-level is the growing field of renewable energy auction design.

In the electricity sector, auctions – technology-neutral and technology-specific (e.g. renewable energy) – have now become standard practice for procuring new power supplies for many countries across the world, including several African countries. The first auctions took place in Brazil, Canada, Chile, China, Ireland, Portugal and the UK (Lucas et al., 2013). The second wave of power sector reforms (2004) was introduced mostly in Latin America in a context in which many low to middle-income countries struggled to increase new electricity supply and needed a new way of attracting generation capacity. Investors were more interested in bidding for long-term contracts than in constructing merchant plants that had to compete to sell power. Auctioning-off these long-term agreements to the lowest bidder proved to be effective in increasing the power generation capacity at a low cost (Hochberg, 2018).

In the renewable energy field, auctions are rapidly becoming the dominant policy mechanism for procuring new capacity (IRENA, 2017; REN21, 2016).

How procurement interactions between the public and private sectors need to be structured and managed is a key concern for the development of successful new renewable generation capacity in Sub-Saharan Africa and the continent as a whole.

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

Table 1: IPP success factors

Factors	Details
Country level	
Stability of economic and legal context	Stability of macro-economic policies. The extent to which the legal system allows contracts to be enforced, the laws to be upheld, and arbitration to be fair. Repayment record and investment rating. Previous experience with private investment.
Energy policy framework	The framework is enshrined in legislation. The framework clearly specifies market structure and roles and terms for private and public sector investments (generally for a single-buyer model, as wholesale competition is not yet a reality 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 licencing and tariff framework. Cost-reflective tariffs. Consumers are protected.
Coherent sectoral planning	Power-planning roles and functions are clear and allocated. Planners are 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. The 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. The 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, taking risks in a project. 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, *force majeure*, 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 (where needed)	Sovereign guarantees (required where financially distressed state-owned utilities are the sole off-takers). Political risk insurance. Partial risk guarantees. Letters of credit. 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 communication, and by strategically managing their contracts, particularly in the face of exogenous shocks and other stresses.

Source: Adapted from Eberhard et al. (2016)

2.2 Renewable Energy Auctions: Design and Implementation Factors

Different frameworks have been proposed to analyse the design, implementation, and success of renewable energy auctions. While there is no prioritised measure of auction success in the literature (Hochberg, 2018), most analyses are primarily interested in the resulting auction prices and project realisation rates[1] (IRENA & CEM, 2015; Tongsopit et al., 2017; Winkler et al., 2018a). Other proposed measures of success include the diversity of bidders/winners, technologies, and locations; the impact on the local value chain; and the social acceptance and impact of the project (GIZ, 2015; Hochberg, 2018; Lucas et al., 2017; Mora et al., 2017). For the purposes of this report, we have focused primarily on price and project realisation outcomes. In-depth country case-studies discuss the additional measures of success, where available.

[1] Realisation rate refers to the degree to which procured projects are built on time. A simple metric for determining the realisation rate is volume commissioned/volume procured.

2.2.1 Auction Design: Key Elements

Renewable energy auctions have been analysed by a wide variety of researchers and organisations (Azuela et al., 2014; Cassetta et al., 2017; del Río, 2017; Del Rio & Linares, 2014; Eberhard & Kåberger, 2016; GIZ, 2015; Hochberg, 2018; IRENA & CEM, 2015; Kreiss et al., 2017; Kruger & Eberhard, 2018; Kylili & Fokaides, 2015; Lucas et al., 2017; Mora et al., 2017; Ngadiron & Radzi, 2016; Shrimali et al., 2016a; Tongsopit et al., 2017; Winkler et al., 2018a). While there are differences between the analytical frameworks used, these differences relate mainly to how separate elements are classified and/or the a priori prioritisation of certain elements. We distilled these frameworks based on analyses of the literature and empirical evidence from the region, resulting in the following auction design analytical framework.

One of the first auction design decisions is project-site selection, whether the project-site is to be chosen by the government (often through the procuring agency), or by the project developers. For renewable energy plants, the proposed project-site is of fundamental importance given the geographic specificity of most renewable energy resources. Government-led project-site selection is usually the result of concerns regarding grid stability and transmission costs in weak and/or small grids, as well as uncertain or risky land tenure arrangements. Governments might also want to pre-select a project-site with the intention of lowering risks (and thereby the tariff) for the project, as well as shortening the project realisation period (del Río, 2017; Fergusson et al., 2015; Lucas et al., 2017). Government site selection most often overlaps with some site preparation by the procurer, including the provision of transmission infrastructure and key permits, including an environmental impact assessment. While, in theory, a government-led site selection approach might lead to a reduced risk profile for projects, research has shown that a poorly executed site selection and preparation strategy increases developer risks, resulting in poor project realisation (Kruger et al., 2018b).

Auction demand is mainly concerned with how much is being procured (volume) and how it is divided between technologies, bidders, regions, projects and time periods. Auction volume is a key determinant of the level of competition (and therefore pricing) in an auction and should be clearly informed by an integrated planning framework. The auction volume can also be bid-out in a technology-neutral manner – where all the technologies compete against each other, such as fossil fuels, or where only renewable energy technologies compete against each other – or by using technology-specific demand bands. The latter option is often preferred when there are concerns regarding supply security in the power system and thus a need for diversification of sources. The auction demand can be set in terms of capacity (MW) or energy (MWh). Project-size limits also ensure increased competition, but might still result in higher prices due to reduced economies of scale. Furthermore, auction volume can be divided across regions, perhaps based on grid capacity studies or other policy objectives. Different types of bidders (e.g. small, local vs. large, international) may also be provided with specific demand bands to achieve certain policy goals. Finally, auction demand can be spread over several rounds of auctions, indeed evidence from various analyses clearly shows the positive impacts, especially in terms of price and localisation, which result from regular scheduled auction rounds (Eberhard & Naude, 2016; International Renewable Energy Agency, 2017; Kruger & Eberhard, 2018; Lucas et al., 2017).

Qualification and compliance requirements are intended to increase project realisation rates and ensure that other policy objectives are achieved. This can be structured as a one-stage or two-stage (pre-qualification round) process. A two-stage process reduces the administrative burden and transaction costs for bidders and policy-makers, but might also result in longer procurement timelines. Reputation requirements are usually concerned with establishing the financial health and technical expertise of the bidding entity; setting these requirements too high might result in lower competition, whereas setting these too low might result in reduced project realisation rates. Qualification requirements aim to ensure that the projects being procured conform to international technology standards; that the site is secured, and permitted and that grid access is ensured (where this is not being provided by the government/procurer). Furthermore, the project must not only conform to local and/or international environmental and social performance standards, but also meet any local economic development requirements (e.g. local content, shareholding thresholds, job creation, etc.).

The **selection process** is primarily concerned with establishing the process and criteria for selecting the auction

winners. It is therefore relevant to the bidding procedure, regardless of whether the auction is based on a sealed bid process (the most popular and simpler choice) (del Río, 2016), a dynamic process (e.g. a descending-clock auction[2]) (Maurer & Barroso, 2011), or a combination of the two. Auctioneers also need to decide whether, and at what level, to set ceiling prices for the auction, and whether to disclose these. They must also decide whether winners will be selected based only on price, or other criteria as well, such as economic development commitments and location, and also whether winners will be paid at the price they bid, or at a uniform or clearing price[3] (Hochberg, 2018).

Seller and buyer liabilities cover a range of issues which aim to reduce risks for bidders and auctioneers. These include the use of bid bonds (to ensure that bidders are committed to signing the contracts); a clear and realistic auction and contract schedule (including lead times between contract award and project commissioning); the remuneration profile of the contracts (e.g. whether prices are fixed, indexed to inflation or another metric, or will vary depending on market prices); how projects are penalised for underperformance and delays (including the use of completion bonds); and how liabilities for transmission delays are to be distributed (including deemed energy payments).

Bankability and risk mitigation refer to elements that enhance the programme's profile from the perspective of potential lenders in renewable energy projects. A key element is the provision of high-quality, standardised, non-negotiable contracts which have been tested with lenders for bankability. These contracts include the Power Purchase Agreement (PPA), Implementation Agreement (IA), Direct Agreements (DA) and Connection Agreements (CA). Auctions in challenging jurisdictions, or where off-takers face financial difficulties, often also come with credit enhancement and loan/payment security measures, such as sovereign guarantees, letters of credit, and guarantee mechanisms offered by international financial institutions (e.g. the Multilateral Investment Guarantee Agency (MIGA) and Partial Risk Guarantee (PRG) cover from the World Bank). A key requirement for attracting international financing to auctions, especially where local capital markets are limited in size or unfamiliar with the technology, is to offer payment contracts in hard currency, such as the US dollar. While hard currency payments open programmes to international lenders, they also expose off-takers and, in turn, governments or the final consumers, to substantial fiscal risks due to currency depreciation (Duve & Witte, 2016).

2.2.2 Auction Implementation: Key Elements

The ability of a well-designed auction to deliver successful outcomes depends on its implementation. Renewable energy auction implementation is an area that has received less attention than auction design, despite being equally important in determining renewable energy auction outcomes (del Río, 2017; Eberhard & Naude, 2016; Kruger & Eberhard, 2018; Lucas et al., 2017; Tongsopit et al., 2017).

Successful auction implementation depends firstly on the programme being implemented by a **politically-supported, capable, mandated, authorised auctioneer** who is able to co-ordinate across government departments (incl. grid planning). Moreover, it is important that the procurement programme is well-resourced; designing and implementing a renewable energy auction is a complex and resource-intensive process requiring extensive financial, legal and technical expertise. However, the costs involved in setting-up and running the programme can be offset by the low prices achieved.

The **implementation process** primarily concerns a commitment to fairness, transparency and trust. This is achieved by the auctioneer[4], through continuous open dialogue with bidders, and by ensuring that the bidding process,

[2] In a descending-clock auction, the auctioneer starts by setting a ceiling price, and asking bidders how much volume they are willing to sell at this price. The price is then lowered until the quantity offered is equal to the quantity to be procured.

[3] While in practice most renewable energy auctions are pay-as-bid, the uniform pricing option is theoretically better suited to the auction since bidders are provided with an incentive to reveal their true costs.

[4] While we use the term, 'auctioneer', to generally denote a single institution, this function can be fulfilled by a combination of responsible entities. This is, for example, the case in many Latin American auction programmes. Having a multi-stakeholder process may increase complexity, but it can also improve transparency and the independence of the programme.

including evaluation, is performed in a secure and transparent manner. Formal bidder briefing and clarification processes, independent review of the auction results and processes, and a commitment to sharing as much information as possible are key to securing and maintaining the market's trust.

03

African Overview

3.African Overview

Renewable energy auctions have spread rapidly across Africa. South Africa was the initial trailblazer, but most countries have now embraced competitive tenders, as shown in Figure 7. Thirty countries have embarked on, or are busy developing, a renewable energy auction programme (Appendix B: Ongoing renewable energy auctions in Africa). 230 IPPs have been awarded, representing 22 GW generation capacity (PFL, 2023).

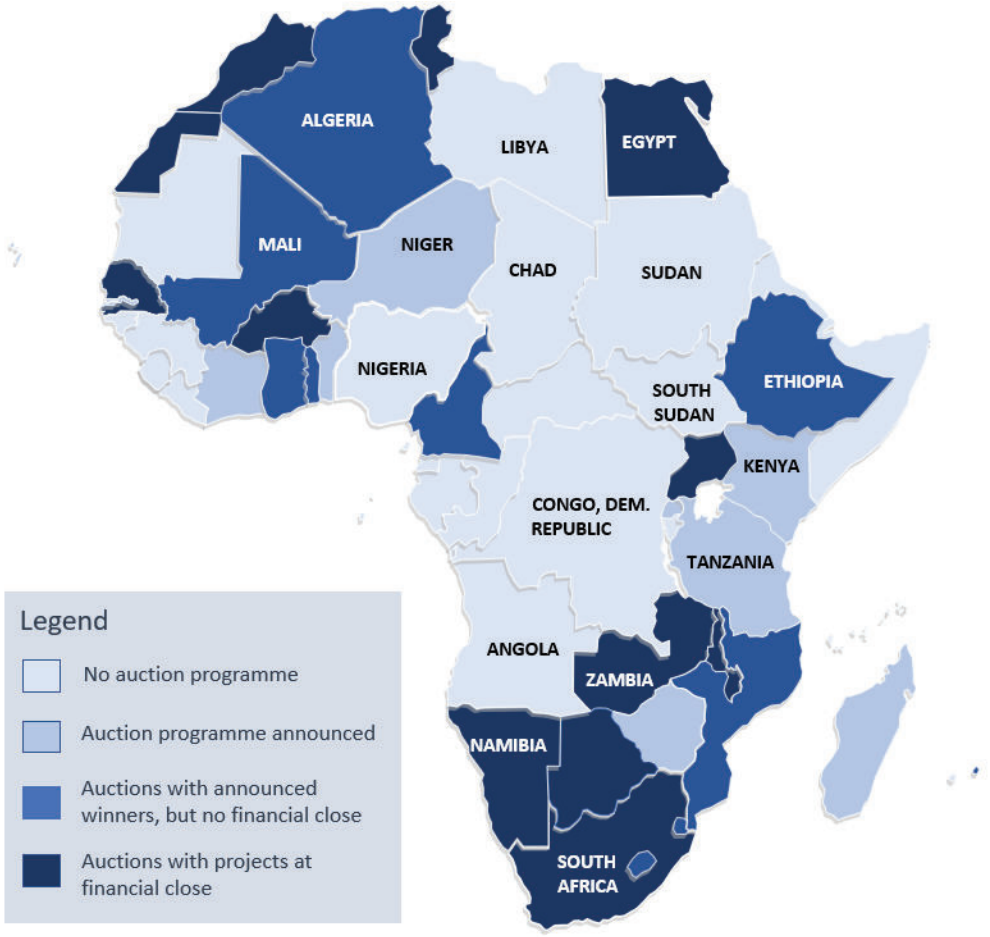

Figure 7: Countries in Africa using renewable energy auctions
Source: (PFL, 2023)

While increasingly widespread, renewable energy auctions have not fully displaced other forms of procurement, in particular direct negotiation, neither have these programmes been a complete success. Many countries which have awarded projects through auctions have still not been able to ensure that these projects are financed and built – at least not without delays. Moreover, even countries with successful track records in building tendered projects have struggled to maintain a consistent and predictable roll-out of auctioned projects. In fact, with the notable exception of South Africa and Mauritius, no other Sub-Saharan African country has seen more than one round of procured projects reach a financial close.

Much of the blame for this situation can be laid at the door of poorly prepared institutions and procurement processes. In general, increasing the volume of successful renewable energy projects depends on three factors:

1. Providing investors with a clear route to market.
2. Providing a suite of bankable contracts and project documents.
3. Providing the necessary risk mitigation and credit enhancement instruments required to ensure project bankability.

In general, auctions can effectively address the first point. Points two and three need to be explicitly incorporated in the auction programme to ensure eventual success. This is where most auction programmes in the region often fail – with tenders failing to account for the fundamental bankability elements required for private power projects. To ensure a sustainable increase in investment volume over time, the above elements need to be embedded in a clear and effective planning-procurement nexus, as previously discussed. This is the reason for large-scale failure in the region, with most auction programmes being initiated in a largely ad-hoc manner with little to no reference to broader power system expansion plans that inform predictable procurement rounds.

There generally seems to be some aversion to paying the 'school fees' required to ensure auction success. An effective auction programme requires considerable investment in both time and resources to prepare the programme and the supplementary documents and plans. In practice, this often requires increasing the capacity of the key institutions involved in the auction's implementation; securing the services of international and national advisors, whether legal, technical or financial, to ensure that the entire process is bankable, along with implementing stringent security and transparency mechanisms to build and retain the market's trust. Skimping on these steps and expenses often comes back to bite auctioning authorities in the form of low levels of market interest (resulting in limited competition and high prices), project implementation delays and outright procurement failures. Even in settings where all of these are in place, there is still the inevitable 'premium' associated with first-mover projects in new markets, where market uncertainty and higher risk perceptions often lead to initial projects being priced at higher levels than those in more developed markets. Countries in the region are still able to benefit from the initial 'school fees' paid in pioneering markets (see Figure 8 and Figure 9), but enjoying the true benefits of an auction programme requires a sustained, long-term commitment that goes beyond an initial project or procurement round, and rather focuses on securing and maintaining the market's trust to drive competition.

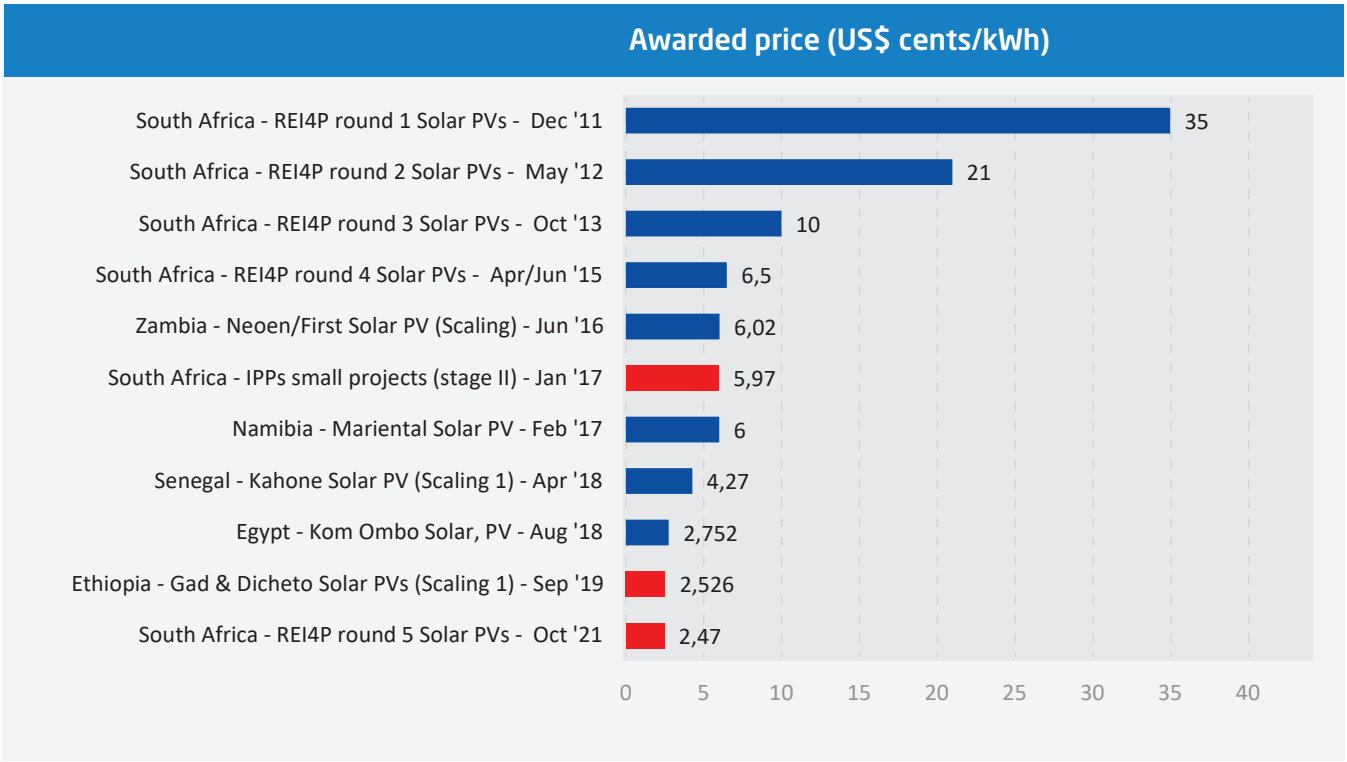

Figure 8: Evolution of record-setting solar PV prices in African renewable energy auctions
NB: Project(s) with a 'red' colour code have either failed to reach financial close (greater than three years after award), or are yet to close (less than three years after award).

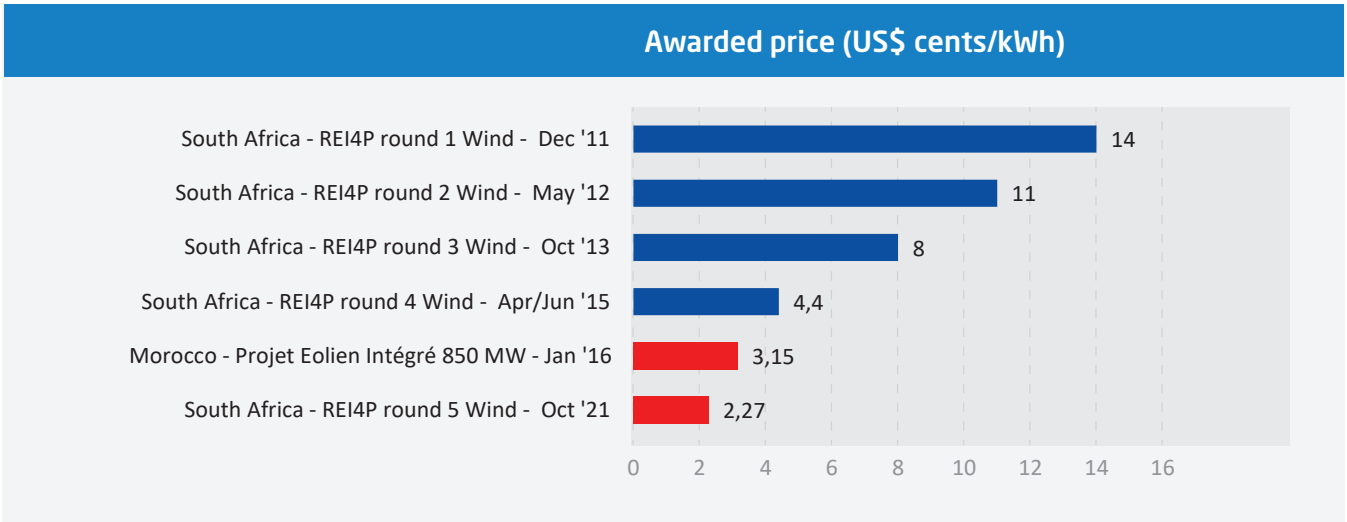

Figure 9: Evolution of record-setting wind prices in African renewable energy auctions
NB: Project(s) with a 'red' colour code have either failed to reach financial close (greater than three years after award), or are yet to close (less than three years after award).

3.1 Regional Overview

At a regional-level, Southern and North Africa have been the most successful in terms of project volumes and pricing secured through renewable energy auctions, led by South Africa in the south and Morocco in the north. West and East Africa have seen a handful of successful auction rounds, but also a number of problematic programmes which have failed to live-up to their promise. Central Africa has generally not been able to successfully host an auction programme as yet. The following section provides a regional overview, followed by in-depth country case-studies.

Southern Africa has been home to the most widespread and successful adoption of renewable energy auctions on the continent. Countries that have implemented renewable energy auctions in the region can broadly be classified as falling into one of two groups.

The first group of countries are those that have been able to successfully witness projects secured through auctions, reach financial close, and commence commercial operations. South Africa leads this group, having first introduced renewable energy auctions in 2011, and having since secured more than 8000 MW, at increasingly competitive prices. The programme was halted between 2015 and 2019 by Eskom's (the state utility) management at the time, who refused to sign awarded PPAs, citing an apparent oversupply of electricity from Eskom's own generation and concerns over seemingly high tariffs offered by IPPs. Both these concerns turned out to be unfounded, with the country quickly slipping into a steadily worsening power supply crisis which caused 10+ hours of rolling blackouts on a daily basis in 2023. Moreover, the prices of these projects were not excessive at the time; in fact, they were below Eskom's average cost of supply[1]. This situation undermined investor confidence in South Africa as an investment destination and played some part in the country's loss of its investment-grade credit-rating in 2018.

[1] Much has been written on Eskom's attempts to protect its incumbent position during this period. There are a number of political economy factors that have come into play to both disrupt and threaten the continued rollout of the programme. The period from 2015 onwards has seen growing opposition to IPPs and RE. Those that had benefitted from other government procurement, many politically connected, felt excluded from the REI4P. Influence-peddling and rent-seeking was much more difficult because of the transparency of the programme and where decisions on investment partners were made by the private sector. Those who had been benefitting from coal contracts with Eskom (the one mining sector that has seen significant entry by emerging local investors), and those who hoped to benefit from a future large nuclear programme, became alarmed at the potential unbundling and break-up of Eskom and the increasing competitiveness and success of solar and wind. Rounds 1 and 2 were more or less under the political radar screen, but then the volumes increased and prices became competitive. This spawned the growth of a number of lobby and activist groups and social media platforms organised against IPPs and RE, which had relative success in promoting a counter-narrative that RE is expensive and is causing Eskom's financial demise. This opposition has been conflated with important, legitimate concerns about the loss of jobs in coal-mining regions, and the extent to which the RE programme has truly afforded South African companies opportunities for participation.

Since then, the programme has struggled to regain its former stature and momentum, with recent procurement rounds marked by delays, design flaws and implementation problems (to be discussed in further detail).

Zambia followed South Africa's lead in 2016, launching the successful Scaling Solar programme (in partnership with the IFC) which secured 2 x 50 MW projects at record-breaking prices at the time. A second round of Scaling Solar[2] was cancelled due to serious investor concerns about ZESCO (the state utility's) payment defaults, as well as sovereign credit-rating downgrades. These concerns ultimately derailed the GETFiT[3] Zambia programme, which had managed to secure solar projects at even lower prices than Scaling Solar only a few years later, but which was unable to bring these to financial close. At around the same time, Namibia launched its renewable energy auction programme, securing the 37 MW Mariental solar PV project at pricing similar to that of Zambia, but with no concessional funding, no sovereign guarantees, and a local currency PPA. This was followed in 2019 by the Khan 20 MW solar PV tender, awarded at close to US$c 3/kWh, but ultimately delayed in its implementation due to the COVID-19 pandemic and supply chain problems. Malawi also implemented a solar auction programme in 2019, with about half of the awarded projects having reached financial close to date.

The second group of countries are those that have launched programmes, but have struggled to ensure project success. Botswana seems to be the land of perpetual opportunity in the region, having initiated several auction rounds in the past 10 years, all of which attracted significant market interest, but were mostly not followed through, seemingly due to limited political support, the absence of clear and consistent policy and an unclear regulatory framework. However, it appears that the country has started to pay the 'school fees' in terms of the procurement design and implementation. This development is expected to pave the way for Botswana to make a breakthrough in the renewable energy auction market, especially considering the successful closure of its maiden solar PV IPP in December 2023. Similarly, Zimbabwe's 2019 tender has not progressed beyond the initial call, although several directly negotiated IPPs (impressively championed by local developers) have managed to reach financial close in recent years, despite an incredibly challenging investment environment, including difficulty in securing foreign exchange. A similar picture emerges in Lesotho, where a 20 MW solar project awarded in 2018, with the PPA being signed in 2021, has still not been able to reach a financial close. However, a directly negotiated Chinese-funded IPP (connecting to the same substation) has now been built, although there are significant concerns regarding the price and quality of this project that need to be addressed. Finally, Mozambique has just started its renewable energy auction journey, although the country has been able to secure a number of solar and gas IPP projects on directly negotiated terms in recent years. The Programa para o Leilão de Energias Renováveis (PROLER)[4] initiative awarded a single project in 2023, but a range of macro-issues, including security concerns in the North of the country, could still derail the success of the programme.

Despite immense potential, there is only one country in **East Africa** that has been able to successfully implement a renewable energy auction programme, namely Mauritius. This small island state has been able to secure more than 200 MW of solar and wind projects over several rounds of procurement, in large part because of a stable and supportive enabling environment underpinned by strong macro-economic fundamentals. Uganda can be considered a partial success as it was able to secure two solar projects through the GETFiT facility using a competitive bidding format to determine the amount of subsidy on top of the existing feed-in tariff in 2015 – however, it has since seemingly abandoned competitive bidding.

[2] The Scaling Solar initiative was established by the World Bank's IFC to facilitate privately-funded, utility-scale solar power investment in Africa. The programme addresses key challenges that hinder solar power development in emerging African markets, including complex regulatory processes, unfamiliar documentation, and high risks (Alao & Kruger, 2021; IFC, 2023).

[3] GETFiT Zambia was designed with the objective of assisting the Zambian Government in implementing its renewable energy FiT strategy. Its primary focus was on the procurement and facilitation of IPPs with a capacity of up to 20 MW. This donor-funded initiative was specifically aimed at enhancing the conditions which encourage private sector engagement in the power sector, while simultaneously strengthening Zambia's power market (GETFiT, 2023).

[4] The PROLER programme aims to support the Mozambican government in designing and implementing transparent, competitive, and sustainable renewable energy auction processes. The programme also focuses on establishing robust technical, financial, and legal frameworks that enable the bankability of these projects to the private sector (PROLER, 2023).

The rest of the region is unfortunately marked by unrealised ambitions. Rwanda launched an auction in 2014, but later cancelled the award. Madagascar prequalified bidders through the World Bank's Scaling Solar programme in 2017, but has made no progress since then. The Scaling Solar initiative, which was designed to create a viable, recurring, and replicable template for attracting competitive, utility-scale solar projects in each country and across the region, has generally proven difficult to scale following its earlier success in Zambia and Senegal[5]. Ethiopia also awarded large solar PV projects at some of the lowest prices in the region in 2017, and again in 2019 (partly through Scaling Solar), but has been unable to bring these projects to close. Ethiopia's inability to achieve its private-sector-led renewable energy ambitions is rooted in uncertainty, disruption and limited trust at the institutional and political-level. Tanzania launched an auction programme in 2019 for 350 MW of solar and wind power, which has now been suspended amidst limited political support, as well as inconsistent and unclear policy regarding private power investment.

Finally, Kenya remains the land of endless promise, having announced its intention to transition to auctions in 2017, and yet is still awarding projects through a negotiated feed-in tariff process six years later. In fact, Kenya's weakness in the planning-procurement nexus, resulted in a sustained public outcry on the high cost of power supplied by the utility, partly (and not necessarily correctly) attributed to capacity payment obligations from IPPs amidst an oversupply situation. To address this issue, the government established a taskforce in 2021 to thoroughly evaluate the terms and conditions of power generation contracts. One of the main recommendations from the taskforce was the cancellation of all the non-concluded PPAs, and the renegotiation of existing ones, which is unsurprising – although still devastating for market confidence – given the procurement approach. Since 2022, extensive negotiations have been taking place between the government and 77 IPPs to reach an agreement aimed at lowering wholesale electricity prices in the country.

West Africa has become a hub of auction activity in recent years, although outcomes are still mixed or uncertain in most cases. Senegal is probably the trailblazing successful case, having secured two projects through Scaling Solar in 2018 which reached financial close a year later. Unfortunately, no follow-up rounds have been conducted since then, as with other countries where the programme was subsequently kick-started. Burkina Faso has received significant support from DFIs (mainly from FMO[6]) to secure solar projects, with five projects (representing more than 144 MW) having reached financial close since 2021, despite a turbulent political situation.

The rest of the countries in the region have struggled to fully realise their ambition, or have only embarked on auctions very recently, such that it is still too early to determine whether they will be successful. Côte d'Ivoire, for example, ran an ultimately unsuccessful tender for three projects in 2016, and tried again through the Scaling Solar programme in 2021, but with no award announcements since then. Togo also announced a Scaling Solar tender in 2019, but has not been able to progress beyond that. Ghana awarded a solar project in 2016, but was unable to bring this project to financial close, and is in the midst of a costly oversupply crisis precipitated by directly negotiated deals with gas-fired IPPs due to a mismatch in its planning-procurement nexus. Mali similarly awarded two projects in 2015 and 2016 through a competitive bidding process, neither of which have been able to reach financial close. Cape Verde and Gambia published requests for proposals in 2019 and 2022, but there have been no updates since then. Benin prequalified four projects, and Niger launched a Scaling Solar RFP in 2022, but, at this stage, there is no clear indication of the success of any of these auctions.

In **Central Africa**, only Cameroon completed a tender for the Guider and Maroua projects in 2019, but neither of them have been able to reach financial close. The rest of Central Africa is generally characterised by low levels of private power investment and renewables penetration.

Finally, **North Africa** has seen significant renewable energy investments in recent years, much of which has been secured through competitive bidding processes. Egypt, Morocco and Tunisia have implemented auctions that have

[5] The scalability of Scaling Solar has so far been limited, as each country generated a unique set of challenges, requiring significant amounts of time and work to get to financial close.

[6] FMO is the Dutch government's development bank based in The Hague, Netherlands.

seen awarded projects reach financial close. Morocco undoubtedly leads the region, supported by strong political backing at the highest level, power sector reforms that strengthen competition and IPP investment, and significant support from the international community. Egypt closed its maiden tender in 2016 by building on the country's Nubian Suns FiT programme from 2014 which awarded 41 projects, 30 of which reached financial close. However, the country has struggled to secure renewable energy projects since then, despite being able to secure major gas-to-power investments. This situation could potentially change in the future, given the country's green hydrogen and regional power trade ambitions, but how investor concerns will be addressed remains to be seen. Tunisia started its auction programme in 2018 and has run nine more rounds since then, awarding close to 900 MW wind and solar PV projects, one of which has now been financed. Algeria has conducted three bidding rounds for renewable energy projects, and as of present, two of these rounds have been successfully awarded. However, it is important to highlight that one of these rounds experienced delays before eventually being awarded.

3.2 Countries and Analysis of Key Design Elements

The five case-study countries: South Africa, Mauritius, Botswana, Ethiopia, and Morocco have been selected to offer a comprehensive and balanced perspective on the successes and challenges of designing and implementing renewable energy auctions across diverse contexts.

South Africa, initially a regional and global trailblazer, highlights the importance of policy certainty, coherent investment strategy, co-ordinated plans, and a capacitated procurer in delivering material renewable energy investments. Its subsequent failures, however, provide valuable lessons on how deviation from IPP success factors can erode investor confidence and derail the entire value chain. Mauritius serves as a remarkable example of success in a small power system, demonstrating the effectiveness of clear policy goals, transparent auction processes, and a bankable off-taker. Botswana's struggles, despite favourable investment conditions, highlight the need for integrated power planning, procurement, and investment frameworks. Ethiopia's challenges shed light on the fact that, beyond political will, clearly mandated and co-ordinated leadership is necessary to realise renewable energy investments. Morocco's inclusion offers insights into how Maghreb economies, with unique socio-political and economic dynamics, can successfully expand their renewable energy capacity using competitive auctions. Lessons from the country also illustrate the significance of political backing, power sector reforms and support from the international community.

It is important to note that this section merely describes the auction programmes from a design and implementation perspective without detailed discussion on the IPP success factors. These elements are discussed in-depth in a subsequent section.

3.2.1 South Africa: a continental and global pacesetter

South Africa's renewable energy auction programme, called the Renewable Energy Independent Power Project Procurement Programme (REI4P[7]), has been widely hailed as an example of regional and global best practice in procurement design and implementation. Recent procurement rounds have, however, been beset by delays, design problems and implementation issues.

With a nominal Gross Domestic Product (GDP) of US$ 420 billion in 2021, South Africa is the second largest economy in Africa and is considered an upper-middle income country (World Bank Group, 2021). Despite its economic potential, South Africa faces several challenges, including high unemployment rates, severe inequality, and a rapidly worsening energy crisis (CSIR, 2022; StatsSA, 2021). The power sector has been struggling to meet energy demand due to an ageing infrastructure, insufficient maintenance, and a lack of investment in the sector, despite power demand being lower than 10 years ago[8]. The state-owned, vertically integrated power utility, Eskom, generates most of the country's electricity (mainly using coal) and has been plagued by financial difficulties, corruption and operational challenges (Kruger & Alao, 2022; PFL, 2023). Most of South Africa's ageing coal fleet is older than 40 years and needs to be decommissioned in the next 10 years. Its newest coal plants – the Medupi and Kusile mega-projects (each 5000 MW) – have been plagued by delays, cost overruns and significant design flaws, resulting in frequent outages and trips. Eskom's debt burden has ballooned because of these new-build projects, with the utility's current earnings only covering about 30% of its debt obligations. Eskom is therefore deeply dependent on the South African government for ongoing financial bailouts, a situation that is becoming increasingly untenable as the South African economy fails to grow beyond 1% per annum (in large part also due to the power crisis).

South Africa's REI4P stalled in 2015 after four rounds of procurement for 6300 MW of wind and solar, due to Eskom's refusal to sign the PPAs of awarded projects, and the Department of Mineral Resources and Energy (DMRE)'s seeming reluctance to continue the REI4P. The auction programme effectively undermined the powerbases of incumbent interests by demonstrating that renewable energy IPPs were both cost-competitive and capable of rapidly deploying capital at scale. Reactions to these impacts prompted resistance from various interests by means of social media, lobbying, and protests, while institutional and leadership changes further complicated the transition. Details on Eskom's reasons for not signing is further explained by Kruger & Alao (2022). The delayed projects would have supplied some of the cheapest power on the grid and, had the programme continued at the same pace, South Africa would have experienced 96% less 'load-shedding' (rolling blackouts) in 2021 (Steyn et al, 2022). The programme was only partly unblocked in 2018 when a new president appointed a new minister of energy and a new Eskom board.

As a result, South Africa has endured severe power shortages, leading to frequent load-shedding and electricity rationing. These circumstances have had a detrimental effect on the country's economy, impacting businesses, households, and the overall growth prospects (CSIR, 2022). It is therefore vital that private power investment is expedited through various means and channels.

Nevertheless, the renewable energy procurement programme is gaining momentum again, with new bid windows being launched, and a pipeline of procurement opportunities announced to address the worsening electricity supply crisis. These new rounds, and some of their accompanying challenges, will be discussed further below. These developments are happening alongside a broader power sector reform programme which involves the unbundling of Eskom and the introduction of a multi-market model that enables municipalities and commercial and industrial consumers to buy power directly from IPPs (Kruger & Alao, 2022). The result is the rapid development of a 'wheeling' market where businesses – mainly energy-intensive users, such as mines and other industrial clients – buy power directly from IPPs, either through behind-the-meter (embedded) installations, or projects that wheel power across Eskom's grid. This private offtake market seems poised to overtake the public procurement programme in terms of

[7] The REI4P is South Africa's maiden competitive tender programme aimed at facilitating private investment in utility-scale, grid-connected renewable energy projects.

[8] While consumption levels have decreased due to load-shedding, the energy intensity of South Africa's economy has seen a significant change since 2008 as electricity prices increased significantly.

volumes and investments, given the country's energy crisis, as well as the need for decarbonisation of some of South Africa's core export industries, to retain market access.

The rest of this section will primarily focus on the public sector REI4P (and its various iterations throughout the years), summarised in Table 2 and Table 3.

Table 2: Overview of the renewable energy auction design and outcome in South Africa

Auction Rounds	Initiation Year	Volume Requested (MW)	Project-Size Limits & Technology Requested (MW)	Capacity / Technology Procured (MW)	Lowest price (US$c/ kWh in Award Year)
Round 1 (REI4P BW 1)	2011	3,626	Wind: up to 140, CSP: up to 100, Solar PV: up to 75, Biomass: up to 25, Biogas: up to 10, Landfill gas: up to 20, Small hydro: up to 40.	1,425	14 (Wind)*
Round 2 (REI4P BW 2)	2012	1,276		1,040	11 (Wind)*
Round 3 (REI4P BW 3)	2013	1,473		1,457	8 (Wind)*
Round 4 (SP-I4P BW 1)	2013	50	Up to 5 for the same technologies as REI4P BW 1 – 4, excluding CSP.	0	6.5 (Solar PV) - Cancelled
Round 5 (REI4P BW 3.5)	2014	200	Wind: up to 140; CSP: up to 100, Solar PV: up to 75, Biomass: up to 25, Biogas: up to 10, Landfill gas: up to 20, Small hydro: up to 40.	200	15 (CSP)*
Round 6 (REI4P BW 4)	2014	2,237		2,253	4.4 (Wind)*
Round 7 (SP-I4P BW 2)	2014	51	Up to 5 for the same technologies as REI4P BW 1 – 4, excluding CSP.	0	5.9 (Solar PV) - Cancelled
Round 8 (RMI4P)	2020	2,000	50 to 450 (technology-neutral).	Wind, solar PV, battery storage	9.9 (technology-neutral)
Round 9 (REI4P BW 5)	2021	2,600	Wind: up to 140, Solar PV: up to 75.	2,583	2.3 (Wind)
Round 10 (REI4P BW 6)	2022	4,200	Wind & Solar PV: 50 to 240.	1,000	2.8 (Solar PV)
Round 11 (BESI4P BW)	2023	513	77 MW (308 MWh) to 153 (612 MWh).	N/A	Yet to be awarded

* Indicates that the price for the round represents an average value.

Table 3: Overview of South Africa's renewable energy auction implementing agencies

Policy and regulation guidelines	Department of Mineral Resources and Energy (DMRE), formerly known as the Department of Energy (DoE)
Regulatory authority	National Energy Regulator of South Africa (NERSA)
Procurer	IPP Office (DMRE/National Treasury/DBSA)
Off-taker	Eskom

3.2.1.1 Design

South Africa has run four types of auction schemes for contracting utility-scale renewable energy generation: the Renewable Energy Independent Power Producer Procurement Programme (REI4P), Small Projects Independent Power Producer Procurement Programme (SP-I4P), Risk Mitigation Independent Power Programme (RMI4P), and the Battery Energy Storage Independent Power Producer Procurement Programme (BESI4P). REI4P is a competitive tender process aimed at facilitating private investment in utility-scale, grid-connected renewable energy projects. The electricity supply constraints experienced in the period from 2008-2011, as well as the need to demonstrate a political commitment to climate change mitigation when South Africa hosted COP17, opened the political space for the rapid implementation of the programme. In 2013, the DoE, later becoming the DMRE[9], introduced the SP-I4P, as a subset of the REI4P, with the objective of procuring 200 MW of generation capacity from small (1-5 MW) projects intended to allow smaller South African players to participate in the programme. These included projects using onshore wind, solar PV, biomass, biogas, and landfill gas (Filipova & Wewege, 2019).

The RMI4P is a 'technology-neutral' competitive tender launched by the DMRE in 2020. It aimed to contract 2,000 MW of 'dispatchable power' to mitigate short-term electricity supply gaps identified in the 2019 IRP, ease supply constraints, and minimise the considerable use of diesel-based peaking generators (Kruger & Alao, 2022).

Lastly, the BESI4P is a new scheme designed to enable the procurement of capacity, energy, and ancillary services from battery storage systems intended to support grid stability, defer transmission system investments and support the system operator in balancing supply and demand (DMRE, 2023).

South Africa's auction programmes are typically designed as a single-round bidding process with no separate pre-qualification stage which expedites the procurement process (IRENA, 2018; Kruger & Alao, 2022). The auction's volume requirement and technology type are determined by the country's Integrated Resource Plan (IRP) (DMRE, 2019; Kruger & Alao, 2022). The IRP allocations typically require determinations by the minister of the DMRE to allow for procurement, after which the IPPO can be instructed to start the procurement process. Typically, ministerial determinations are broken down into smaller volumes to be procured over several rounds, so as to ensure competitive pressure in the bidding process.

The programmes are largely location-agnostic, with project developers/ bidders needing to find, secure and prepare project-sites prior to bidding. While perhaps not unique in the broader international context, this makes the country an outlier in Sub-Saharan Africa, where most renewable energy auctions incorporate some form of government involvement in the site selection and preparation process (Kruger, Stritzke, et al., 2019). The one exception is the energy storage BESI4P RFP, which specified five substations and their respective storage capacity in the country's Northern Cape region.

The selection process commences with an initial 'pass or fail' evaluation of certain functional and qualification requirements, including legal and technical compliance, proof of financial and commercial capability, and socio-(economic) development[10] (ED / SED) (Kruger & Alao, 2022).

These requirements are rigorous to ensure that, theoretically at least, only highly motivated and capable bidders, who can execute their projects in a timely manner, are selected (Kruger & Alao, 2022). In general, projects need to be near 'financial close ready' by the time of submission, which adds to the cost of bidding, but also ensures high realisation rates. A key requirement in the South African programme concerns the funding commitment: all the bids need to include signed commitment letters from all the funders (debt and equity) confirming their acceptance of the project agreements and their commitment to funding the proposed project. This largely outsources the due diligence

[9] The Department of Energy became the Department of Mineral Resources and Energy (DMRE) when the DoE was amalgamated with the Department of Mineral Resources under Minister Gwede Mantashe in 2019.

[10] The 2023 ESIPPPP does not feature economic development requirements as qualification criteria due to the relevant sections of the Preferential Public Procurement Framework Act having been declared unconstitutional.

of the project to the banks, ensuring that only viable projects advance. Later rounds have seen this commitment requirement being somewhat diluted, with commitment letters being non-binding on the funders, which seems to have somewhat limited the due diligence checks originally included.

From Bid Window 6 (Round 10) under the legal structure, members, shareholders, advisors and lenders are not permitted to participate across sister bids[11], but are allowed to be involved in more than one bid within the same group of sister bids. This design is unlike earlier procurement rounds, which permitted members to participate in more than one bid submission, and was motivated by increased concentration among awarded bidders, especially Broad-based Black Economic Empowerment (B-BBEE) shareholders. Technical compliance requirements cover technology standards for the proposed project, including project-size limits, technology type, etc. Financial and commercial requirements consider aspects such as the financial standing and robustness of the funding proposal, value for money, and the posting of a bid bond and performance guarantee (Kruger & Alao, 2022). Bidders are evaluated based on either their fundraising track-record, or their financial assets.

The bid bonds are financial commitments by the bidders, denominated in ZAR/MW in South Africa's case. These commitments generally take various forms as acceptable by the procurer, including cash deposits, bank guarantees, standby letters-of-credit, etc. These bonds serve as a security measure for the procurer, allowing them to call upon the commitment should bidders fail to sign the project agreements, or do not adhere to the commitments made in their bids. These bonds are meant to encourage realistic bids and ensure bidder commitment. On being appointed a preferred bidder, this bid guarantee needs to be replaced by a preferred bidder guarantee (performance bond) – double the value of the bid guarantee - which remains in place until the project reaches financial close (Kruger & Alao, 2022).

The (Socio-) Economic Development (ED/SED) requirements (Appendix D: SED as qualification requirement in South Africa's tender), are designed to foster job creation, local industrialisation, community development and black economic empowerment (Kruger & Alao, 2022). In recent rounds, bidders who could not meet some of the (socio-) economic development requirements (mainly local content) could apply for an exemption from the Department of Trade, Industry and Competition before the bid submission date. Approved exemptions were applied to all bidders (IPP Office, 2020; SAWEA, 2021).

Bids that comply with the functional and qualification requirements are thereafter assessed on a competitive and comparative basis, with 'preferred bidder' status being awarded to the highest ranked projects within the capacity allocation (Kruger & Alao, 2022).

This assessment has historically been weighted towards lowest price (70%), but also considers certain ED/SED elements (30%), as shown in Appendix E: SED as ranking criteria in South Africa's tender. Recent rounds have been adjusted to weigh tariffs (90%) much higher than ED/SED (10%) as per the Preferential Procurement Policy Framework legislated weighting (Filipova & Wewege, 2019; Kruger & Alao, 2022). This decision is due to the fact that the DMRE's IPP Office did not receive a timely exemption that would allow it to deviate from the legislated 90:10 weighting.

Preferred bidders sign a PPA with Eskom for the sale of electricity for 20 years, but 15 for battery storage, as per the BESI4P BW. PPA payments are indexed to local inflation and paid in local currency (ZAR). The RFP also allows for some adjustment to the submitted pricing for movements in exchange and inflation rates between bid submission and award. Payments in earlier bid rounds were solely for energy, but recent programmes have included ancillary services and/or capacity (Kruger & Alao, 2022).

The South African government provides sovereign guarantees, as part of the IA, to cover Eskom default and expropriation. This is necessary, as the PPA and regulations did not allow bidders to find alternative off-takers in the case of an Eskom default. Eskom's dire financial situation means that it is not a creditworthy off-taker, necessitating

[11] A case where the same entities or consortium members, have more than one bid in a particular procurement round.

support from its shareholder (the SA government). The National Treasury sought to limit its exposure to this guarantee by entering into an intergovernmental framework agreement with Eskom, DMRE and the national energy regulator, (NERSA) – effectively guaranteeing that NERSA will treat the PPA payments as a 'pass-through' when determining Eskom tariff levels. While this goes some way towards mitigating the financial exposure, the country's shrinking fiscal space, along with Eskom's worsening financial situation and the effective deregulation of much of the market, is prompting the National Treasury to reconsider extending this guarantee for future bidding rounds (Kruger & Alao, 2022).

3.2.1.2 Implementation

The initial step in procuring renewable energy generation in South Africa was the design of a renewable energy feed-in tariff (REFiT), launched in 2009. However, this initiative was plagued by implementation issues, including NERSA's limited financial and technical ability to run the programme. The Department of Energy (now known as the Department of Mineral Resources and Energy, DMRE) sought the assistance of the National Treasury's PPP unit to help manage the process of setting-up competitive tenders to avoid similar institutional capacity shortfalls experienced by the regulator in the REFiT scheme. The PPP unit was established in 2000 and, since 2007, has been working with the private sector, helping to promote IPPs (Filipova & Wewege, 2019).

In November 2010, a small team from the PPP unit and the now DMRE together created the IPP Office, overseen by the Department. The office had the advantage of being highly respected by both private and public sector stakeholders and it enjoyed high-level public-sector support, which enhanced its credibility. Despite the IPP Office reporting to the DoE, it was mandated with facilitating and running the entire REI4P process and was allowed to operate independently, outside the regulatory and funding scope of the DoE (Filipova & Wewege, 2019). The IPP Office became the key institution mandated with designing and implementing the auction programme, kickstarted in 2011 (Kruger & Alao, 2022).

Co-ordination among government entities has been key to the success of the country's auctions, particularly the earlier REI4P rounds. The Minister of the DMRE issues Ministerial Determinations for capacity based on the Integrated Resource Plan (IRP), determining the electricity mix of the country in the long-term. Following a public consultation process (as established by South Africa's constitution and the Electricity Regulation Act), NERSA is bound to issue generation licences to IPPs as per these determinations[12], and the RFPs issued by the auction are also required to align with these determinations, in terms of the amount of generation capacity to be procured (Filipova & Wewege, 2019; Kruger & Alao, 2022)[13].

The IPP Office runs the procurement bidding process, selects the preferred bidders, and submits a motivated list to the DMRE. The Department then approves the list of preferred bidders. Other government departments, including the Department of Trade and Industry, also provide their input on qualification criteria. IPP project developers prepare and submit bids through the IPP Office. This process also requires the involvement of relevant provincial and municipal departments, to provide authorisation to meet the bid qualification criteria (Filipova & Wewege, 2019).

The procurement programme has also received significant financial and technical backing since its inception. The DoE, National Treasury, Development Bank of Southern Africa (DBSA), and various bilateral donor agencies, provided funding for the REI4P programme in order to hire transaction advisers, set-up a project office, and facilitate capacity-building. Likewise, upon signing IAs, successful IPP companies pay a bidder registration fee, as well as a project development fee totalling 1% of the total project costs, into a project development fund for renewable energy projects. This fund effectively provides financing for the IPP Office and all its activities (Filipova & Wewege, 2019).

The IPP Office contracts various local and international financial, legal, and technical transaction advisers to provide

[12] Recent regulatory amendments have completely removed the need for generation licences to be issued by NERSA.

[13] Recent regulatory amendments have removed the need for generation licences, which limits NERSA's role in this process going forward.

technical support in setting-up and running REI4P (Filipova & Wewege, 2019). The Office also comprises a capable management team, technical and legal experts, all of whom contributed to the success of the initial REI4P rounds.

Despite the programme's initial success, implementation has been hampered by industry incumbents. Eskom has played a major role in this regard. Eskom's top management refused to sign 37 PPAs awarded in Round 6 (REI4P BW 4), citing an oversupply of electricity from its own generation, and reservations regarding what, in its judgement, appeared to be elevated tariffs proposed by IPPs. Eskom further claimed that this capacity excess would have negative implications for its future financial performance. This procurement impasse was happening amidst renewables becoming the cheapest form of new-build power available to Eskom. The hiatus effectively lasted until April 2018, undermining investor confidence in the sector and creating uncertainty regarding the future of the programme (Filipova & Wewege, 2019). This hiatus created a funding shortfall and forced the IPP Office – which is self-funded – to reduce its staff complement. While the resumption of new procurement rounds has opened funding opportunities for the unit, the loss of capacity and institutional memory has impacted upon the overall performance of recent auctions (Kruger & Alao, 2022). Given the size of the programme, and its increasing complexity, the urgency of South Africa's energy security challenge, and the volume of new power required, it is clear that far more advisory capacity is needed, alongside other skills. There is also current uncertainty regarding the IPP Office's future institutional setting, with the most obvious location being the independent transmission, system and market operator. This has, however, not yet been decided (Kruger & Alao, 2022).

In addition, there have been important co-ordination challenges and capacity constraints with regards to securing grid access (including costing), an issue that has been exacerbated by the explosion of distributed generation projects also all wanting to connect to the grid outside of the REI4P process (Kruger & Alao, 2022).

Finally, it is concerning that accusations have been made regarding impropriety in the bidding process and outcomes, specifically in Round 8 (RMI4P). These allegations largely concern the fact that the tender rules were designed to specifically favour gas-fired power projects and were adjusted throughout the bidding process to provide an unfair advantage to a specific company, namely Karpowership. These allegations concern the granting of local content exemptions to these bidders (which artificially increased their score on this front); the extension of the bid submission deadline at the last moment; the requirement that all facilities be greenfield (except for floating storage and regasification units, which the DMRE confirmed could be brownfield); the late decision to allow diesel as fuel, and a last-minute scrapping of the remaining local content threshold (Kruger & Alao, 2022).

3.2.1.3 Outcomes

South Africa's auction programme, particularly the initial REI4P rounds, enabled impressive realisation outcomes and, in the later rounds, competitive price outcomes. These successes are even more notable when considering the substantial economic development commitments which were included in the bids.

Market-readiness in the maiden auction round was significantly overestimated, resulting in limited competition and high prices. The tendered volume was lowered in subsequent rounds, resulting in greater competition and lower prices. Awarded prices have routinely been below Eskom's average cost of supply since Round 6 (REI4P BW 4), and the most recent rounds have seen prices below Eskom's average cost of generation (PFL, 2023). This is a significant outcome for a country whose power system is dominated by coal, resulting in a least-cost power system planning model now picking solar and wind as the main sources of new generation. The price for wind projects declined by 84%, from US$c 14 to US$c 2.27/kWh, while that of solar PV projects fell by 93%, from US$c 35 to US$c 2.5/kWh (PFL, 2023).

Possibly due to the increased price competition, recent rounds have witnessed increased market concentration among awarded bidders and especially B-BBEE partners. This market concentration has thus far neither resulted in market domination (with competition levels remaining high enough for market power), nor led to price increases (Kruger & Alao, 2022).

Prices in future tenders are potentially likely to be less competitive compared to the tariffs that the country has become accustomed to; after all, network constraints in high renewable resource regions could result in projects with slightly poorer resource profiles being selected, and in less competition in general in the bidding round (Kruger & Alao, 2022). This situation is already evident in the most recently completed tender – Round 10 (REI4P BW 6) – where there was a dramatic reduction in bidder turnout compared to the previous round. No wind power projects were awarded in the tender due to grid constraints in the Eastern and Western Cape supply areas where these projects were situated; this was because of a costly lack of co-ordination with Eskom's grid access unit. All the spare capacity in these regions was assigned to IPPs with corporate PPAs in the period between bid submission and award – a sign of the rapidly growing private off-take market in the country (Alao & Kruger, 2023).

Project realisation rates in the REI4P rounds have been some of the highest in the world, in large part due to the programme's design features aimed at ensuring project financing and due diligence (Kruger & Alao, 2022). All REI4P projects contracted between BWs 1 and 4 have been fully financed, except for the Mkuze biomass project. Only two of the funded IPPs are yet to come online: the 102 MW Copperton wind farm, and the 25 MW Ngodwana biomass power plant (PFL, 2023).

The SP-I4P was less successful. None of the awarded projects had their PPAs signed by Eskom and were eventually cancelled in 2022; a surprising outcome considering that these projects experienced the same impasse that had prevented the Round 6 (REI4P BW 4) projects from advancing (although this was resolved in 2018). No official reasons were communicated for the cancellation of the contracts. This outcome exposes the discrepancies between what the government often touts as its priorities, and the actual reality. These projects were specifically designed to help stimulate and support the local market, yet they seem to have fallen by the wayside (Filipova & Wewege, 2019; Kruger & Alao, 2022).

The procurement impasse, caused by a lack of policy and investment uncertainty, is now haunting the latest procurement window, and at a time when local manufacturing capacity, technical skills and the expertise needed to meet the country's urgent energy needs have been decimated; this, in turn, is bound to delay and undermine the rollout of future procurement programmes (Kruger & Alao, 2022).

The outcome of the RMI4P has been less promising. Most of the contracted capacity in the tender was awarded to three gas-fired power ships that have zero local content (after receiving certain ED/SED exemptions), are relatively expensive (with gas costs being passed on to electricity consumers, along with currency fluctuations), and are responsible for emitting methane, a potent greenhouse gas. The implementation of the power ships experienced delays and has now been officially cancelled following the expiration of their grid connection budget quotes. The setbacks were due to their failure to secure environmental permits (after an emergency environmental permitting exemption was retracted), as well as permits from the local port authorities (Kruger & Alao, 2022; PFL, 2023). These floating power plants are a symbol of major failures in the country's long-term power sector planning-procurement strategy, as these facilities are in any event only employed in emergency settings and not regarded as long-term power plants. Moreover, utilising emergency procurement to address supply crises could create opportunities for inflated pricing, kickbacks, mismanagement of funds, and nepotism, as evidenced in the Kenyan and Ghanian power sector sagas (Festus, 2019; Festus & Aled, 2019).

Of the RMI4P projects, only the Kenhardt portfolio developed by the Norwegian company, Scatec, managed to meet the initial deadline. Impressively, it reached financial close and completed construction despite being awarded 'Additional Preferred Bidder' status three months after the other projects in the round. By the final deadline, four more projects had progressed past commercial or financial close. It is worth noting that only Scatec's projects and another facility, named Oya Energy, were earlier designed as wholly renewable. However, as of the time of writing, the remaining projects which have met the DMRE's deadline are those that transitioned to entirely renewable projects, abandoning conventional gas or diesel fuel in their hybrid portfolios. The Umoyilanga project removed 'LPG' from its original portfolio before reaching financial close. The Mulilo Total Hydra Storage project ditched the 'diesel' component in its hybrid project prior to financial close. ACWA Power's DAO reached commercial close only after dropping the 'diesel' composition from its original portfolio. That these projects are front-runners in an auction

designed to contract dispatchable power attests to the considerable competitiveness of renewables in the sector. Design and institutional co-ordination flaws, unnecessary complexity, legal challenges, and substantive allegations of undue influence continue to taint the programme and have effectively led to the sinking of the power ships and another hybrid project which includes gas and batteries (Kruger & Alao, 2022; PFL, 2023).

Round 9 (REI4P BW 5) also experienced considerable setbacks. Preferred bidders did not meet the financial close deadlines set by the DMRE. One of the main reasons for this was the delay in securing accurate budget quotes from Eskom for grid connections. Half (12 in total) of the awarded projects – all submitted by a Globeleq-Mainstream consortium – failed to reach financial close and have now been cancelled. At the time of announcement, global value chains were already under pressure due to the global pandemic, and commodity prices were on the rise. In the intervening period, the Russia-Ukraine war has caused global inflation spikes and put global value chains under even more pressure. Only nine out of the original 25 awarded projects managed to reach financial close due to overly aggressive pricing assumptions.

This situation highlights the increasing importance of incorporating more structured, transparent, and fair flexibility in the procurement process. A pre-set tariff adjustment methodology, based on observable and quantifiable changes in market conditions, could ensure more projects reach completion. Ultimately, the success of an auction lies in the eventual delivery of competitively priced power and, as such, it is important that contingencies are in place to support the execution of contracted projects. It is uncertain whether bid bonds will be called on the BW5 projects that have failed to progress, but their cancellation should at least open up significant grid capacity for use in future rounds. At this stage, it seems unlikely that the market will repeat the mistake of overly aggressive pricing assumptions, as the high level of competition in Round 9 (REI4P BW 5), following over four years of procurement hiatus, as well as the spikes in commodity and input prices converging at a difficult time for the market. (Socio)-economic development commitments have been another remarkable outcome of most of the procurement rounds, particularly the REI4P (Appendix F: SED commitments in South Africa's REI4P). Local content requirements play a crucial role in the programme – potentially stimulating local manufacturing investment and sustainable job creation. This is particularly important in a country with severe inequality, particularly rooted in the apartheid era, which has left a legacy of economic disparities and joblessness that persist to this day. However, local content requirements have not necessarily resulted in the establishment of a robust renewable energy industry as initially planned, mainly due to the stop-start nature of the procurement programme – in particular the 2015-2018 hiatus, which caused several factories to close their doors, thus diminishing local manufacturing capacity (Filipova & Wewege, 2019; Kruger & Alao, 2022).

The programme has also reportedly created at least over 40,000 job years[14] for South African citizens. Between BWs 1 and 4, the share of black citizens employed during construction was 79% and, in operations, 83%. Additionally, the reported share of local community members as a share of South Africa-based employees was 49% and 67% for construction and operations respectively. There are concerns regarding market concentration among B-BBEE investors, especially in the latest rounds, which undermine the broader empowerment objectives of the programme, as well as the B-BBEE policy itself. Considering the South African government's goal of promoting wider participation in the sector, it is good to see the IPP office incorporating auction design measures in new rounds which specifically address and mitigate concentration amongst B-BBEE investors. The repeated rounds of procurement allow for iterative changes in the programme to address emergent problems, one of the great benefits of a long-term, predictable auction programme.

The success of South Africa's auction programme, especially the early REI4P rounds, can be attributed to several factors, including the presence of a mature and sufficiently deep capital market, policy certainty and an associated investment strategy, consistent and coherent plans which translate into competitive procurement, effective co-ordination among government entities, and an independent and capacitated procurement authority. However, the subsequent start-stop-start, delayed procurement process has eroded investor confidence, leading to

[14] A job year is the equivalent of a full-time employment opportunity for one person for one year.

negative impacts across the value chain, such as the reduced capacity of the auctioneer, diminished ability of local manufacturing, and uncertainty around the institutional setting and procurement rules, amongst other factors. The most obvious effect of the procurement impasse has been the declining reliability of the power system, with the country now experiencing its worst frequency and duration of load-shedding to date (Alao & Kruger, 2023). The recent failures provide a clear and simple lesson – trust is difficult to gain but easy to lose (Filipova & Wewege, 2019). One of the most important objectives for any auction should be to establish and maintain trust, as it is crucial for the programme's success.

A final note on the legacy of the programme: despite its recent problems, REI4P has arguably provided South Africa with the best option for saving its electricity system and, consequently, its economy. Thanks to the track record and capacity built-up via the programme, the country's private sector is now investing heavily in renewables, with recently reported figures from private off-takers eclipsing REI4P volumes. REI4P (and its various manifestations) also still offer the best public procurement option for addressing the country's power crisis, placing the country in a much stronger position than it would have been in its absence.

3.2.2 Mauritius: a silent achiever

Mauritius presents an interesting case of a nation that has achieved considerable success with minimal fuss in terms of accelerating renewable energy investments through private power competitive procurement. The country is a small island developing state situated in the southwest Indian Ocean (Dinesh & Pravesh, 2017; Statistics Mauritius, 2015). It has a population of 1.26 million, with a GDP of US$ 12.9 billion (World Bank, 2020c; World Bank Group, 2021).

Mauritius has experienced sustained economic growth over the past few decades, averaging a growth rate of around 3% year-on-year from the mid-1980s to date (World Bank, 2022). The key sectors that have contributed to the country's economic growth include tourism, textiles and apparel, financial services, information and communication technology, and offshore banking (ITA, 2023). Mauritius has also generally maintained macro-economic stability over the years. The government has implemented sound economic policies, including fiscal discipline, inflation targeting, and prudent monetary management. The country has a relatively low inflation rate and has managed to maintain a stable exchange rate. It has also made efforts to diversify its economy and reduce dependency on traditional sectors, thus contributing to overall stability (BTI, 2022b; ITA, 2023). Mauritius has a long history of political stability and peaceful democratic governance. The country gained independence in 1968 and has since enjoyed a stable political environment. It operates as a parliamentary democracy, with regular free and fair elections. It has a multi-party system and power transfers have occurred peacefully by means of democratic processes. Political stability has contributed to the country's economic success and investor comfort (BTI, 2022b; UK Government, 2023).

Mauritius mainly relies on imported fossil fuel to meet its energy demands, exposing it to external shocks in the international market, such as the soaring oil and coal prices in 2022 due to the Russian invasion of Ukraine (Dinesh & Pravesh, 2017; Zumar, 2018). Renewable electricity investments have accelerated in the last decade, propelled by the 2009-2025 national Long-Term Energy Strategy and the Renewable Energy Roadmap 2030 for the electricity sector. This roadmap was initiated to increase the share of renewables to at least 37% of the energy mix by 2025 and 60% of the energy mix by 2030 (CEB, 2015; MEPU, 2022). There was no utility-scale wind or solar power generation in the country at the time of the enactment of the strategy, but renewables currently account for 35% of the total installed generation capacity (MEPU, 2022). Most of this capacity is supplied by IPPs, contracted through competitive auctions.

Commencing in 2011, Mauritius implemented several tenders for grid-connected large-scale IPPs (Table 3) (CEB, 2014). The first renewable energy tender was launched in 2011 for wind generators, leading to the award of 29.4 MW capacity (CEB, 2013). A second auction round was held for solar PV in March 2012, awarding 10 MW generation capacity. The competitive tender hiatus between 2012 and 2015 featured a few unsolicited bids. In May 2013, CEB entered into a PPA with a private developer for a 15 MW solar PV project through direct procurement. In July 2013, another contract was signed, through direct procurement, for a 9.35 MW onshore wind farm. In 2014, the off-taker undertook a grid absorption study, by means of a consultancy, to provide measures for integrating more intermittent renewable energy into the insular grid. Based on the outcome of the study, two rounds of auctions were conducted for large solar PV plants, awarding 40 MW (Oct 2015) and 13 MW (Feb 2016).

In August 2018, the CEB commissioned 4 MWh battery storage projects at two 66 kV substations to enable greater injection of renewable energy. In December 2021, the CEB commissioned another 14 MWh battery storage projects at another four 66 kV substations. These storage facilities ushered in fresh rounds of auctions in 2021: a 30 MW wind farm (Round 5), which was eventually cancelled due to unresponsive/uncompliant bids, and a 3 x 10 MW solar farm (Round 6), which awarded two units. A seventh auction round was held in March 2022 for 100 MW utility-scale renewable capacity which included battery storage (CEB, 2022a, 2022b). Finally, an eighth round was held in March 2022 for 40 MW small-scale renewable energy hybrid facilities (solar PV and battery storage).

Table 4: Overview of the renewable energy auction design and outcome in Mauritius

Auction Rounds	Initiation Year	Volume Requested (MW)	Project-Size Limits (MW)	Technology Requested	Capacity Procured (MW)	Lowest Price (US$c/kWh in Award Year)
Round 1	2011	29.4	Option 1: 10 and Option 2: 30	Wind	29.4	11.89
Round 2	2012	10	2	Solar PV	10	15.5
Round 3	2015	45	10 to 15	Solar PV	75	10
Round 4	2016	20	1 to 9	Solar PV	13	9.4
Round 5	2021	30	10 to 30	Wind	0	Cancelled
Round 6	2021	30	10	Solar PV	20	4.94
Round 7	2022	100	10 to 30	Solar PV and battery storage	90	9.9
Round 8	2022	40	1 to 10	Solar PV and battery storage	40	10.4

Table 5: Overview of Mauritius' renewable energy auction key implementing agencies

Policy and regulation guidelines	Ministry of Energy and Public Utilities (MEPU)
Regulatory authority	Utility Regulatory Authority
Procurer	Central Electricity Board (CEB)
Off-taker	Central Electricity Board (CEB)

3.2.2.1 Design

Competitive procurement programmes in Mauritius are generally designed as sealed-bid, pay-as-bid, technology-specific tenders conducted in two stages: an expression of interest, or request for information, followed by a request for proposal (CEB, 2013, 2015, 2016, 2022a, 2022b). The auctions are typically location-agnostic, with bidders having to find, secure and prepare project-sites prior to bidding. Nevertheless, projects can only connect to certain eligible, country-wide substations, where provided.

Qualification is based on pass/fail mandatory requirements to theoretically ensure that only capable bidders, who can implement the project within the development time-frame, are selected. The financial requirements typically include confirmation of the bidder's financial capabilities, covering average annual turnover and net worth. Bids must include signed letters of intent from all funders (debt and equity) confirming their understanding and acceptance of the project agreements, and their plans to fund the proposed project. However, unlike South Africa which requires letters of commitment from funders, the arrangement in Mauritius is non-binding. As such, projects do not undergo major due diligence from investors prior to bid submission. The technical requirements include experience and expertise in the design and installation of the specific renewable energy technology, and the quality and durability of the proposed components. In Round 2, the technical requirement is included in the scoring for winner selection, rather than as a qualification requirement for a responsive bid. However, since Round 3, this requirement now falls under the pass/fail stage. Although the technical requirements are stringent, they can be met through sub-contractors, e.g. EPC, thus weakening the compliance criteria.

Other qualification requirements include the securing of a land reservation letter or lease agreement, and the posting of a bid security through a local commercial bank (e.g. US$ 28,000[1]/MW in Rounds 3 to 6). This bid security can be called on by the procurer if bidders withdraw their bid after the submission deadline, or after being successful, fail to sign the project agreements, provide a performance/development security, or abide by commitments in their bids. Following the award and signing of the PPA (spanning 20 years for Round 1 to 6, and 25 years for Rounds 7 and

[1] Exchange rate at the time of the tender: US$ 1 = MUR 35.84.

8) with the successful bidders, this bid security is replaced by a performance/development security, which can be redeemed a few months (three months for Rounds 5 and 6) after commercial operation.

Bid ranking is primarily based on price, which can be denominated in the local currency (MUR) alone, or in a mix of MUR and US$ (Rounds 1 to 4), or MUR, US$, and EUR (Rounds 5 and 6). The inclusion of MUR is designed to minimise currency exchange risks, although, as mentioned, exchange rate risk is limited due to the country's sound economic policies, including fiscal discipline, inflation targeting, and prudent monetary management. The US$, EUR denominations can typically comprise up to 80% of the tariff (CEB, 2013, 2015, 2016, 2022a, 2022b). Essentially, bidders can make an offer based on any of the currencies, but not more than the prescribed cap for foreign denominations. The MUR component of the bid typically includes an escalation in MUR/US$, forecast to align with future exchange rates over the PPA term. The mix between the local and foreign currency effectively ensures that currency risk is shared between the off-taker and IPP. The tariff in foreign currency is converted into local currency using an exchange rate. The off-taker pays the IPP in local currency monthly in line with the PPA. IPPs can convert the local currency into foreign currency at local banks. It is important to note that the Bank of Mauritius is responsible for overseeing and regulating the foreign exchange operations within the country.

In Round 2, bids were weighted at 70% based on their financial offer, and 30% on their technical offer, comprising technical capability, module type, inverter efficiency, and the suitability of the interconnecting substation (CEB, 2015). In Rounds 3 to 6, the tender is designed to score bids entirely based on their proposed tariff after the initial pass/fail assessment at the qualification process.

Since 2014, the government has ceased providing sovereign guarantees for power projects for two main reasons. Firstly, this commitment becomes a contingent liability on the government's balance sheet, impacting upon its overall financial health and credit-rating[2]. Secondly, the CEB has proven itself as a creditworthy off-taker[3] and has never defaulted on its contractual payment obligations with existing IPPs.

3.2.2.2 Implementation

The electricity market structure in Mauritius is characterised by a vertically integrated utility model, with the state-owned Central Electricity Board (CEB) operating under the aegis of the Ministry of Energy and Public Utilities (MEPU), and being the sole entity responsible for the transmission and distribution of electricity. Comprehensive electricity reforms are gaining traction in Mauritius with plans to vertically unbundle the CEB and to establish a new regulator, the Utility Regulatory Authority (URA). The URA was established in 2016, but only recently began fully acting on its mandate of licencing, tariff, rate-setting and so forth, tasks previously managed by the CEB.

The CEB has historically dominated the electricity generation market, with IPPs playing a relatively small role (Dinesh & Pravesh, 2017; Zumar, 2018). However, since the 2000s, the number of IPPs in the country has gradually increased, beginning with power projects in the sugar industry. Currently, the CEB produces about 40% of the country's total power requirements from its four thermal, and ten hydroelectric, power stations, with the remaining 60% being supplied by IPPs. With an increasing focus on renewable energy, and the launch of tenders for solar and wind projects, the contribution of renewable IPPs has been gradually growing.

The CEB is responsible for implementing renewable energy competitive auctions in the country. Successful IPPs are awarded PPAs for a period of 20 years (MEPU, 2022), except for the last two rounds of auctions whereby the PPAs were awarded for a term of 25 years. The projects are contracted on a build-own-operate (BOO) basis (PFL, 2023). The CEB is generally considered a credible, bankable and relatively trustworthy procurer, but it was embroiled in a power procurement scandal in 2018 known as the 'Saint Louis Gate scandal'. This involved allegations of corruption and

[2] All credit-ratings in the report are based on Moody's, whose scoring approach is outlined in Appendix C: Moody's Long-Term Credit-Rating Methodology

[3] Although there is presently no credit-rating available for the CEB, Mauritius boasts one of the healthiest credit-ratings on the continent, standing at Baa3.

favouritism in the awarding of contracts for the redevelopment of an old power plant owned by the CEB. This scandal is not linked to the procurement of electricity from IPPs by way of PPAs. However, stakeholders in the industry are concerned that this incident could reduce trust in the CEB from the private sector in future tenders (African Energy, 2022; ISS, 2020).

3.2.2.3 Outcomes

Mauritius has procured 258 MW capacity from wind (29.4 MW) and solar (229 MW) through its renewable energy auction programmes. Most rounds have been oversubscribed by between two to four times the requested volumes (CEB, 2013, 2015, 2016, 2022a, 2022b). To achieve low tariffs, the CEB encourages preferred bidders to match the lowest-price offer, but this request is not mandatory and has not always materialised, especially in recent tenders. Preferred bidders between Rounds 1 and 3 were required to match the lowest-price offer, but this has not been the case since Round 4, as bidders have opposed this approach due to the disparity between the different projects-sites, grid connection points, equipment type, etc. The technology composition of the two latest tenders (Round 5 and 6) permitting renewable energy hybrid generation makes such price matching even more difficult to accomplish.

Despite Mauritius' implementation of multiple auction rounds, prices have not experienced a significant decline compared to its auction front-running peer, South Africa, and this can be partly attributed to the country's smaller market-size, leading to fewer economies of scale. The lack of a predictable programme, the struggles of awarded projects to reach financial close, and the regulatory uncertainty in the sector, further contribute to lower levels of competition and higher cost of capital, unnecessarily exerting upwards price pressure.

Many of the contracted projects in the auctions have reached financial close and come online, but a few have been abandoned. The most notable is the sole wind farm procured through the tenders – the 24.9 MW Plaine Sophie Wind farm. The power station was awarded to a consortium consisting of an Indian multinational company – Suzlon Group (26%) – and a Mauritian-based firm, PADGreen (74%). The project-site was provided by the government in the tender, but was later discovered to have been situated on state land, with a national forest and near a catchment area, which created delays in the site-permitting. Numerous extensions were provided to the developer to implement the project. Plaine Sophie eventually reached financial close and commenced construction in 2014, having secured project debt funding from the following DFIs: the Eastern and Southern African Trade and Development Bank, and the Export-Import Bank of India (India Exim Bank). There were additional delays with the commissioning due to the financial position of the shareholders. One of the equity shareholders was the wind turbine supplier, through a sister company (technical shareholder). The turbine supplier experienced financial difficulties and had to undergo a process of financial administration. The other equity shareholder expressed their desire to replace the turbine supplier and also requested the removal of the latter's shareholding in the special purpose company. However, these plans did not materialise, as the entity was subsequently embroiled in the Saint Louise Gate scandal that led to its debarment. All of these setbacks ensured that the developers could not complete the project within the time-frame provided by the contract. The CEB called on the development securities.

Overall, Mauritius's renewable energy auctions results are commendable, given that the government does not provide credit enhancement and risk mitigation support for procured projects sitting with long-term PPAs. In summary, the success of the auctions in Mauritius can be attributed to a combination of factors, including clear policy goals and a regulatory framework, transparent and competitive auction processes, and a macro-environment which is attractive to international investors. Despite some challenges, Mauritius's renewable energy auction programme has been successful, demonstrating the country's ability to attract private sector participation and achieve its renewable energy targets.

3.2.3 Botswana: a toe in the water

Botswana appears close to finally breaking into the renewable energy market with its inaugural solar PV IPP. It is a mineral-rich, landlocked country in southern Africa, bordered by South Africa, Namibia, Zambia, and Zimbabwe (Reuters, 2021). With a population of approximately 2.4 million, it is one of the least populous countries on the continent, but boasts one of the highest GDP per capita (World Bank, 2020b, 2020c; World Bank Group, 2021). Botswana's economic growth has been primarily driven by its diamond mining industry. The government has implemented policies to ensure that revenues from diamond exports are efficiently managed and reinvested in diversifying the economy. Botswana has made efforts to develop other sectors, such as tourism, agriculture and manufacturing, to reduce its dependency on diamonds and promote sustainable growth. It has maintained macro-economic stability, thanks to responsible fiscal and monetary policies contributing to low levels of public debt (with an A3 credit-rating – the strongest in Africa), and a favourable investment climate for foreign direct investment (Freedom House, 2020; World Bank, 2022). Botswana is widely regarded as one of Africa's most politically stable countries. Since gaining independence in 1966, the country has enjoyed a multi-party democracy and a peaceful political environment. Regular elections have been held, and power transitions have taken place smoothly (BTI, 2022a; Freedom House, 2020).

Botswana has witnessed a substantial increase in its electrification rate over the past decade, from 58% in 2013, to 76% in 2021, a transformation that has been primarily driven by robust and sustained GDP growth (World Bank, 2020a, 2022). Only a fraction of the installed capacity (450 MW) is available for power generation, while the remaining demand is satisfied by electricity imports. Morupule A (132 MW) and B (600 MW) coal-fired power stations are the main power generators in the sector, but, due to technical challenges, only a portion of their volumes are available to serve demand. Two diesel-fired peaking plants, Orapa (90 MW) and Matshelagabedi (70 MW), help to balance the fluctuating power requirements in the electricity network and operate during periods of high-level demand for electricity, or shortfalls in the electricity supply.

Botswana's economic growth is necessitating power system expansion, especially given its reliance on imports from South Africa, which itself is facing an energy crisis (Ugochukwu, 2020; USAID, 2023). The country has attempted to achieve this expansion through additional coal-fired power stations (primarily through a 300 MW extension of Morupule B) owing to its massive coal reserves, but it is struggling to secure funding.

The existing generators are all situated in the north, while an abundance of solar energy resources, mainly in the south, and vast tracts of land for renewable development, remain underutilised. The country has set a national target of 15% of its power to be generated by renewable energy by 2030, but has only recently concluded financing of its first utility-scale renewable energy plant (Bellini, 2017; IRENA, 2021a; Mooiman & Matlotse, 2016; RenewAfrica, 2022; Reuters, 2021). After many years of struggling to deploy utility-scale renewable projects – initially using feed-in tariffs and later through competitive tenders – it seems that the country might finally see its first utility-scale solar PV plant being constructed.

Table 6: Overview of the renewable energy auction design and outcome in Botswana

Auction Rounds	Initiation Year	Volume Requested (MW)	Project-Size Limits (MW)	Technology Requested	Capacity Procured (MW)	Lowest Price (US$c/kWh in Award Year)
Round 1	2015, relaunched 2017, and again in 2019	100	50	CSP or PV	50 MW	N/A
Round 2	2015	100	100	CSP	Nil	Nil
Round 3	2018	N/A	N/A	Solar PV	Nil	Nil
Round 4	2022	N/A	N/A	Solar PV	Nil	Nil
Round 5	2022	200	100	CSP	Nil	Nil

Round 6	2023	N/A	N/A	Solar PV	Nil	Nil

Table 7: Overview of Botswana's renewable energy auction key implementing agencies

Policy and regulation guidelines	Ministry of Mineral Resources, Green Technology and Energy Security (MMGE)
Regulatory authority	Botswana Energy Regulatory Authority (BERA)
Procurer	Botswana Power Corporation (BPC)
Off-taker	Botswana Power Corporation (BPC)

3.2.3.1 Design

Botswana's renewable energy auctions are typically sealed-bid, location-specific, two-stage competitive tenders (Mooiman & Matlotse, 2016; PFL, 2023). Project-sites are specifically selected and prepared by BPC and include a transmission connection point. The requirements at the expression of interest, or pre-qualification stage, are stringent, mandating bidders to demonstrate their capability, experience, and qualification to execute the project (BPC, 2017; PFL, 2023). An expensive bid bond (up to US$ 1 million) is also required. The costs of meeting the qualification requirements (including the bid bond) are significant, only adding to the sense of grievance and loss of trust when these auction rounds end up being cancelled. Bidders need to replace the bid bond with an even more expensive performance bond (US$ 4 million) upon being awarded preferred bidder status. This performance bond stays in place until the project reaches commercial operation.

Bidders are scored on a combination of price and economic development, and compete for a 25-year power purchase agreement with BPC. The PPA price is partially indexed to local inflation and the Pula/US$ exchange rate, providing some hedging against currency depreciation and inflationary risks. No sovereign guarantee is provided – deemed to be unnecessary given the Botswanan government's role as shareholder of BPC. There is, however, a three-month liquidity facility provided, as well as a letter of comfort from the government. Proposed projects need to include at least 40% local ownership, but it is not immediately mandatory. This requirement becomes applicable only if there is a demonstrated level of interest and capability in the local capital market.

3.2.3.2 Implementation

The Botswanan electricity market is vertically integrated and based on the single-buyer model (IRENA & AfDB, 2022). The three institutions which are central to Botswana's renewable energy auction programmes are: the Ministry of Minerals, Green Technology and Energy Security (MMGE), the Botswana Energy Regulatory Authority (BERA), and the Botswana Power Corporation (BPC). MMGE is the lead energy policy-making authority in the country, whilst BERA and BPC operate under its purview (Botswanan Government, 2023). BERA regulates the market, developing the energy plans and framework, and granting generation licences to private power producers (Ugochukwu, 2020). The Botswana Power Corporation (BPC) – the state-owned power utility overseeing electricity generation, transmission, and distribution – designs and implements the renewable energy auctions in the country under the purview of the Ministry (MMGE) (BPC, 2022; Ugochukwu, 2020). BPC procures the resulting capacity and evacuates the physical power under a long-term PPA (BPC, 2017, 2018, 2022). Capacity expansion planning seems to only be loosely linked to renewable energy targets and procurement windows. Botswana's IRP (2020) lacks robust infrastructure expansion measures to meet the present targets. Furthermore, there appears to be limited co-ordination between generation procurement and system needs. For instance, the lack of battery storage and synchronous generators in the southern region of the country poses operational challenges for solar and wind power integration.

Botswana does not possess a grid code which is conducive for renewable power generation, that is, one that prioritises their access to the grid and incentivises despatch based on marginal cost (IRENA, 2021a). BPC also has a limited number of trained engineers who are familiar with transmission and connection planning. Lastly, BERA is a relatively young and inexperienced regulator (AfDB, 2019b), and thus possesses limited capacity in the formulation of

plans and regulations supporting independent renewable energy production.

After two previous unsuccessful tenders for 2 x 50 MW solar PV projects in 2015 and 2017, BPC engaged several international and local financial, technical and legal advisors to implement the 2019 tender. This extensive team was assembled to provide support and mitigate potential risks for the relaunch of the tender, which included the Selebi-Phikwe and Jwaneng projects, each with a capacity of 50 MW (IFC, 2024; PFL, 2023) . As a result of their efforts, project documents were generally considered to conform to lender bankability requirements, including on risk allocation. There nevertheless still appear to have been some problems with the award of the Jwaneng project; this is discussed in more detail below.

3.2.3.3 Outcomes

Botswana has attempted to procure more than 500 MW of solar power capacity by means of competitive tenders since 2015, but has only awarded 50 MW thus far. There has been momentous interest in most of the tenders, given the country's investment grade credit-rating and stable political environment. The maiden tender for solar power in 2015 attracted 118 consortiums for just 2 x 50 MW available capacity (Mooiman & Matlotse, 2016). This tender was relaunched in 2017, attracting 166 bids (BPC, 2017).

The 50 MW Selibi-Phikwe project was awarded in August 2021 to a consortium led by Scatec at a very competitive tariff (although details of the tariff have not been released) (IFC, 2024). The project had its PPA signed in August 2022 and reached financial close in December 2023 (PFL, 2023). The IFC provided a loan of US$ 16.4 million, and mobilised US$ 15 million equivalent in Pula (BWP 206 million) from the First National Bank of Botswana, acting through its Rand Merchant Bank (RMB) division. A second project award – part of the same tender – was challenged in court and eventually set aside. To fulfil local content requirements, Scatec intends to sell-down 40% of its shares in the project company to local Botswanan investors within five years after commercial operations on a best-effort basis (IFC, 2024; Scatec Solar, 2023).

Overall, Botswana's procurement approach and strategy seem disjointed. The inaugural tender in 2015 was structured as an IPP, but later suspended. It was relaunched twice, first in 2017 as a PPP/JV, and later in 2019 as an IPP (BPC, 2017; Mooiman & Matlotse, 2016; Reuters, 2019). The government also initially favoured CSP technology, including an option for CSP or PV in the earliest tender, and CSP alone in the second auction programme. However, this ambition was cut short, citing the high cost and low scalability of CSP technology, and the need to prioritise more affordable energy solutions (SPW, 2016). Nevertheless, a CSP tender was again announced in 2022, highlighting Botswana's inconsistent approach to renewable energy procurement backed by a clear planning framework (BPC, 2022). A few further rounds have been announced with no details about how much volume is intended to be procured (PFL, 2023), an approach that does not provide a solid basis for private sector competition. Renewable energy auctions require a stable and predictable policy environment to attract investment and encourage competition. The Selibi project has the potential to transform Botswana's approach to renewables, providing a viable alternative to the struggling coal power plants (incl. those from South Africa).

While Botswana's pursuit of renewable energy through auctions has encountered significant challenges, it still offers valuable lessons for other countries. Despite its rich mineral resources, stable political environment, and favourable investment climate, the country required a dedicated, well-resourced procurement programme to realise this potential. The continued roll-out of procurement windows in a transparent, predictable manner will be critical for realising the long-term benefits of the country's substantial solar resources.

To attract investment and foster a thriving renewable energy sector, the country needs to adopt a more integrated and comprehensive approach which includes a clear and long-term renewable energy strategy, streamlined regulations, transparent auction processes, and enhanced financial and technical support for renewable energy projects. By addressing these key areas, Botswana can create a favourable environment that attracts investors, encourages competition, and facilitates the successful implementation of utility-scale renewable energy projects.

3.2.4 Ethiopia: a promising scheme yet to deliver on its investment

Ethiopia exemplifies an auction scheme that was once considered promising, but has failed to deliver investments. As the oldest independent nation in Africa, the country has a rich history, with its only period of colonial rule being a six-year occupation by Italy in the early to mid-1900s (Kruger, Stuurman, et al., 2019). With a population of more than 105 million, Ethiopia is the most populous landlocked nation in the world and Africa's second most populous country (World Bank, 2020c). Despite its large population, Ethiopia is still a predominantly rural country, with more than 80% of the population engaged in agriculture. However, the country has experienced significant economic growth and development in recent years, with a focus on industrialisation, infrastructure development, and the expansion of social services (AfDB, 2019a; RMB, 2017).

Until recently, Ethiopia was regarded as Africa's fastest growing economy, a boom that was primarily driven by public sector spending (World Bank Group, 2021). However, economic growth has been reduced by COVID-19's impact on the travel industry, and the ongoing civil war in the Tigray region, situated in the northern part of the country. The conflict, which is one of a series of internal insurrections and external aggressions that have bedevilled Ethiopia over several decades, began in 2020 and has escalated into a humanitarian crisis, deepening the country's development challenges which include high poverty rates, unemployment, and a limited supply of electricity (Badwaza, 2018; Goyal, 2022).

The power system struggles to maintain the supply quality and meet rising energy demands, propelled by the country's economic growth rate. This shortfall is exacerbated by weather-related events, such as droughts, that impact upon the power generation network which is dominated by large hydropower plants (Dorothal, 2019). The government has sought to increase renewable energy capacity, such as geothermal, wind and solar power, to improve system resiliency. It has also implemented reforms aimed at attracting private investment, including the use of PPPs, IPPs, and renewable energy auctions (Kruger, Stuurman, et al., 2019).

Ethiopia's renewable energy auction programmes were once touted as having the potential to become an example of regional best practice. However, seven years after the launch of the maiden programme, the country is yet to welcome any investments from the schemes (PFL, 2023). The programme's relapse was initially hindered by various causes inherent in the auctions' design and implementation. More worrying is the fact that, even if these issues were resolved, this would not immediately translate into foreign direct investments due to the current political instability in the region.

The following sections will investigate the design and implementation choices of, and the challenges faced by Ethiopia's renewable energy auctions. This will shed light on the country's intricate shift towards the private-sector driven development of power capacity.

Table 9: Overview of the renewable energy auction design and outcome in Ethiopia

Auction Rounds	Initiation Year	Volume Requested (MW)	Project-Size Limits (MW)	Technology Requested	Capacity Procured (MW)	Lowest Price (US$c/kWh in Award Year)
Round 1	2016	100	100	Solar PV	100*	5.7
Round 2	2017	250	125		250*	2.5 - Cancelled
Round 3	2019	750	150		N/A	Yet to be awarded

*None of the awarded projects have reached financial close or started construction

Table 10: Overview of Ethiopia's renewable energy auction key implementing agencies

Policy and regulation guidelines	Ministry of Water, Irrigation and Energy (MoWIE)
Regulatory authority	Ethiopian Energy Authority (EEA)
Procurer	Ethiopian Electric Power (EEP)/PPP directorate general
Off-taker	Ethiopian Electric Power (EEP)

3.2.4.1 Design

Ethiopia has conducted three renewable energy auction programmes to date. All three rounds were focused on solar PV, mainly due to the simplicity of the technology and the country's good solar resources[1]. The first (Round 1) tender, (Metehara), was fully government-led, whereas the other two (Rounds 2 and 3) were initially run under the Scaling Solar initiative, before the IFC withdrew its participation in Round 2 at the last minute due to bankability/foreign currency availability challenges. Scaling Solar represents a more mature and potentially 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.

The Ethiopian auctions comprise a two-step bidding process: a pre-qualification stage, followed by a full request for proposals being issued to shortlisted firms. They are site-specific, with the government selecting the project-site and providing bidders with geotechnical studies and a detailed environmental and social impact assessment. They are also volume-specific, with Ethiopia being one of the earliest countries in SSA to tender volumes greater than 100 MW, designed to maximise economies of scale and lower tariffs.

Bidders are required to comply with certain legal, technical, financial, commercial, environmental and social requirements to succeed in the pre-qualification stage. The aim of this phase is to prove that bidders have the capacity to implement their bids. The technical requirement asks bidders to prove that the project partners, their proposed contractors, as well as equipment suppliers, have adequate experience and capacity. The financial and commercial requirements are designed to demonstrate that bidders are able to mobilise sufficient funding to develop the project. Credit-committee approved, signed term sheets were required from bidders for the Scaling Solar projects, subject to final due diligence-based approval.

The Metehara project, however, had no such requirement, with bidders only needing to present a financing plan without specific indications of commitment by either equity, or debt providers. Furthermore, the financial and commercial requirements included penalty mechanisms to encourage bidder compliance and commitment. A bid bond was required to be posted, which was to be replaced by performance bonds once the project was awarded.

The environmental and social requirements mandate the use of local content (15% of the project's CAPEX) and incorporating local ownership (15% shareholding) into the project company. The most recent tender requested bidders to commit to training and hiring Ethiopians (although this was 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 PPP tenders for a period of five years.

Prequalified bids were thereafter scored and ranked, based on both technical and financial criteria on a 30:70 basis for the Metehara (Round 1) tender, and financial criteria alone for the Scaling Solar (Round 2) programme. The technical criteria included bidder and component track record and local content and ownership, while the financial criterion was simply the lowest price offered. For this reason, Scaling Solar's technical qualification requirements were more substantial than Metehara's. Successful bids were provided with 20-year take-or-pay PPAs, denominated

[1] Plans for a 'Scaling Wind' programme, supported in part by wind-mapping by the Danish Energy Agency, were scuppered, or at least delayed, when the initial Scaling Solar procurement rounds ran into problems.

in US$ (but to be paid in Birr).

The Scaling Solar (Round 2) bidding process provided for the possibility of a single bidder submitting the lowest price for both projects. In such a case, the next lowest bidder(s) would be asked to meet the lowest price that had been bid for that project. If none of these bidders could meet this price, both projects would be awarded to the lowest bidder. It appears that the programme employed this approach (to minimise the risk of projects not being developed) by awarding contracts to two different bidders, while preserving the cost benefit[2].

Beyond performance bond commitments, other potential penalties also applied to bidders after the project was awarded. The project PPA included a liquidated damages clause for each day that the project failed to reach its commercial operation date, as well as a generation underperformance penalty. 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 decommissioning bond one year before the end of the PPA.

IPPs in Ethiopia face various risks, but the two main risks affect the off-taker (EEP) and the currency. The government provides sovereign guarantees that cover debt (principal and interest), equity (outstanding and forecast return), termination costs in the case of off-taker default, and debt plus equity not yet contributed in the case of *force majeure*. It also provides six months' worth of payment guarantees in the form of commercial bank letters-of-credit from EEP. These guarantees are furthermore supported by the World Bank Group through a dedicated Ethiopian Renewable Energy Guarantees Programme 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 MIGA moreover provides optional cover for up to 90% of the projects' equity, and 95% of the debt in the case of expropriation, war, or civil disturbance. For Metehara (Round 1), these World Bank guarantees were only made available post-award, while they formed part of the RFP package for the Scaling Solar (Round 2) projects. Currency convertibility and availability risk were 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[3]. The Ethiopian central bank's refusal and/or inability to provide this kind of guarantee, for reasons that will further be explained in the Implementation section, ultimately undermined this principle and led to the withdrawal of IFC finance from the Scaling Solar programme, along with its PRG and MIGA inconvertibility guarantees against currency exchange and inconvertibility risks. The Ethiopian government has recently affirmed its commitment to provide foreign exchange guarantees to foreign companies engaged in joint ventures with the government or private companies on projects identified as key or strategic, including power generation and mining (Ethiopian Reporter, 2023). In light of this, the National Bank of Ethiopia enacted Directive No. FXD/86/2023, aimed at attracting strategic investors across multiple sectors through the opening of offshore accounts, currency convertibility guarantees and modified debt-to-equity ratios (EY, 2023). It remains to be seen whether all the IPPs will qualify to benefit from this provision.

3.2.4.2 Implementation

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. Whilst 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 disorientating. Scaling Solar's RFP process was delayed by almost a year when Abyi 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 (Round 1) project, EEP's central role in the procurement

[2] This approach differs from Zambia's Scaling Solar programme, where the RFP documentation explicitly states that only one project could be awarded to each bidder.

[3] Currency convertibility risk would always be a key potential impediment for any procurement programme, given the country's balance of payments and currency convertibility challenges.

process was replaced (or at least diminished) by institutions created through new PPP legislation. This included a new PPP board, which took on the responsibility of approving new projects and determining their risk allocation. The board is chaired by the Ministry of Finance and Economic Co-operation (MFEC) and comprises members from various government entities such as 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, and the Ministry of Federal and Pastoralist Affairs. Additionally, two members representing the private sector are also included in the board, ensuring private sector involvement and perspectives. The board is served by a newly created secretariat – the PPP directorate general – and 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 between these key decision-makers during the procurement processes. For example, despite the fact that the bidding documents for the Scaling Solar programme stated that all foreign exchange provisions in the documents were subject to approval by the National Bank of Ethiopia (NBE), they themselves were only consulted around 4-6 weeks before the submission deadline. The 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 the NBE's rationale 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. When it became clear that these forex provisions would not be met, the IFC had indicated, just one day before the bid submission deadline, that it considered the projects non-bankable and subsequently withdrew its term sheets. This effectively meant that four out of the five bids were now incomplete and thus consequently disqualified. The government apparently allowed these bidders an extra two weeks to find alternative financiers. During this time, new lenders, including the IFC, presented term sheets, but with the requirement that foreign exchange risk be adequately mitigated. As a result, all the bidders were disqualified, except for ACWA, whose documents did not include this condition. However, it is worth noting that ACWA Power later requested the mitigation of foreign exchange risk after submitting their bid.

Despite some teething problems, the temporary uncertainties and gaps created by the various reforms will hopefully 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, as well as the growing regional instability created by the civil war. 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, which 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 itself 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 to the approaches taken by Zambia, Uganda and, to some degree, South Africa, where foreign and/or private-sector advisers play a key role in shaping, implementing, and advising on auction design, bid evaluation and approval processes (Kruger & Eberhard, 2018). Communication with the private sector – including bidders and their lenders, but also advisers – 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 played a prominent role in 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. Furthermore, the US department of commerce has been providing support to the new PPP directorate and board on PPP legislation. Denmark has 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 the Danish Energy Agency have been supporting wind mapping and measurement efforts, capacity-building efforts on renewable energy auctions and project finance, whilst also 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. Following extensive discussions between the World Bank Group and the government, the government decided to adhere to the National Bank of Ethiopia's Directive, which does not allow for a government guarantee of foreign exchange convertibility and transferability. The IFC was thus unable to proceed with the standard scaling solar programme financing. As a result, the transaction is no longer a Scaling Solar transaction. The IFC has, however, been mandated to advise the government on how it can address these problems, which could lead to a re-launch of the Scaling Solar and Scaling Wind processes.

Ethiopia confirms the central role of trust in both the bidding process and in the implementing institutions. The ongoing uncertainty, and lack of open engagement, have 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.

3.2.4.3 Outcomes

The private sector signalled its willingness to enter the Ethiopian power market, with affordably priced, renewable energy projects, by means of the country's two completed auction programmes. Metehara (Round 1) 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. Round 2 (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 consist of large, international companies with substantial experience and financial backing. In fact, the qualification criteria appeared to have been set so high, that only three of the biggest companies – ENEL Green Power (EGP), Scatec Solar and Mitsui – were able, or willing, to qualify on their own merits (without forming part of a consortium). Of the 12 prequalified consortia, only five decided to submit a full proposal.

Both the Metehara (Round 1) and Scaling Solar (Round 2) projects were awarded to two of the biggest renewable energy IPP companies in the world. Metehara was awarded to EGP at a price of US$c 5.89/kWh – the lowest in Sub-Saharan Africa (outside of South Africa) at the time of award. Interestingly, the Enel Green Power consortium's bid was not the cheapest, indicating that local ownership and local content evaluation criteria played a determining role in the award decision. Metehara represents Ethiopia's first competitively procured IPP and it 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 seven 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. A key issue during the initial years post-award was the project-site: local communities were unhappy about the potential location, resulting in conflict and the delay of the project development and due diligence activities. It is not clear if this was ever resolved. It also seems that the announcement of the much cheaper Scaling Solar projects diminished the government's appetite for finalising the relatively more expensive Metehara project.

Both Scaling Solar projects were awarded to ACWA Power based in Saudi Arabia. The awarding of the two Scaling Solar projects has been controversial, not only because both projects went to the same bidder – in contrast to that which the RFP appears to have intended – but mainly because ACWA was the only bidder not to be disqualified. The

first round of Scaling Solar in Ethiopia has been shrouded in confusion and uncertainty, despite the awarded projects again breaking African solar PV price records (Hamilton, 2019). ACWA's submitted tariff in Ethiopia was equally record-breaking for the continent at US$c 2.5/kWh. 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 incentives for tariff reduction. All the companies which submitted bids, with the exception of ACWA Power, decided to make use of this financing package with such exceptional concessions. When the IFC withdrew their commitment to provide financing one day before the submission deadline, due to the unavailability of currency convertibility guarantees, these bidders were unable to provide credit-committee approved term sheets, which was a key qualification requirement. Despite being granted a two-week extension to secure alternative financiers, the bidders were unable to do so, because the lenders insisted on sufficient measures to mitigate foreign exchange risk.

ACWA Power decided not to make use of the IFC's loan package, instead bidding with a loan package from the Bank of China, which did not include any condition for the mitigation of foreign exchange risk. Post-award, ACWA had apparently been in discussions with the likes of the African Development Bank (AfDB), the Bank of China, and various Saudi funds to finalise the loan terms. In the end, the company was unable to reach financial close (as the lenders still required foreign exchange mitigation), and the project was terminated in 2022 by the PPP board due to the ACWA's inability to progress (after several extensions). This illustrates the importance of not only including stringent qualification criteria as part of bid packages, in particular binding lender commitments where possible (as was, for example, required in South Africa), but also adequate preparation and co-ordination work being done beforehand to ensure the overall bankability of the programme.

The Scaling Solar award tells a crucial story about the importance of building and retaining the trust of the market. Ethiopia, 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 witness 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.

A second phase of Scaling Solar (Round 3) was expanded in April 2019 to 500 MW across four projects. An additional 250 MW was included in May 2019, resulting in a total tendered capacity of 750 MW, allocated across six projects (World Bank Group, 2019). No progress or further announcements have been made. Overall, uncertainty, disruption and limited trust, at both the institutional and political-level, is at the heart of Ethiopia's apparent failure to realise its private sector-led renewable energy ambitions. The Metehara and Scaling Solar tenders have been marked by seemingly intractable challenges, which has led to them being unable to meet international investor and lender requirements, with the result being that no IPP has been able to reach financial close to date. What is even more worrying is the fact that, even if these issues are now resolved, it may not immediately translate into direct foreign investment due to the current political and social climate.

3.2.5 Morocco: North Africa's shining light

Morocco is an emerging economy in North Africa which, in recent years, has taken significant strides to expand its renewable energy capacity to not just meet its growing demand, but also reduce dependence on imported fossil fuels (Luigi et al., 2016; Mansita Njie, 2019).

Morocco has experienced notable economic growth and attained stability in both its macro-economy and political landscape. The country has implemented reforms to foster development and attract foreign investment. Morocco's economic growth has been consistent, with a focus on diversifying sectors, such as manufacturing, tourism, agriculture and renewable energy. The government's prudent fiscal policies have contributed to macro-economic stability by reducing budget deficits (credit-rating: Ba1) and implementing structural reforms. The country has maintained stable monetary policies through its central bank, ensuring currency stability and the managing of inflation. Politically, Morocco has a constitutional monarchy with King Mohammed VI as the head of state, providing relatively stable leadership compared to many other countries in the region. The government has undertaken political reforms to enhance democratic governance and promote political participation and human-rights. Social development programmes have also been implemented to address socio-economic challenges. However, no country is entirely devoid of political challenges, and Morocco still faces socio-economic issues, such as unemployment, poverty, and income inequality, amongst others, that require attention (Atradius, 2021; BTI, 2022c).

Until the late 2000s, Morocco met virtually all its energy needs from imported fossil fuels, exposing it to volatile international energy prices (Clean Technica, 2016; Luigi et al., 2016). The development and implementation of the National Energy Strategy (NES), Solar Plan (MSP), and the Integrated Wind Energy Programme (IWEP) between 2009 and 2010 served as the impetus for the country's shift towards renewable energy development (Mansita Njie, 2019; Roberto & Karen, 2019). These plans were followed by an ambitious target for renewables to constitute 42% of power capacity by 2020 rising to 52% by 2030 (BNEF, 2023; Parkinson, 2016; Luigi et al., 2016).

The country further liberalised its electricity industry and began procuring new solar and wind capacity through auctions to meet its renewable energy targets (IEA, 2016). Before Morocco's renewable energy goals were announced, the country had only 280 MW of wind capacity, but by 2023, it had more than 2 GW of renewable energy installed capacity (BNEF, 2023). Morocco's shift towards green growth has effectively positioned it as North Africa's renewable energy leader (Roberto & Karen, 2019). It has twice broken the world tariff record for renewable energy and hosts some of the world's largest and most innovative renewable energy facilities, as seen in its auction programme summary in Table 10 and Table 11.

Table 10: Overview of the renewable energy auction design and outcome in Morocco

Auction Rounds	Initiation Year	Volume Requested (MW)	Project-Size Limits (MW)	Technology Requested (MW)	Capacity/ Technology Procured (MW)	Lowest Price (US$c/ kWh in Award Year)
Round 1 (Noor Ouarzazate I)	2010	160	N/A	CSP	160	15.9
Round 2 (Taza)	2012	150	N/A	Wind	150	N/A
Round 3 (Noor Ouarzazate II)	2014	200	N/A	CSP	200	13.6
Round 4 (Noor Ouarzazate III)	2014	150	N/A	CSP	150	14.2
Round 5 (Noor Ouarzazate IV)	2016	70	N/A	CSP	70	N/A
Round 6 (Projet Eolien Intégré)	2016	850	N/A	Wind	850	2.5
Round 7 (Noor I PV)	2016	170	N/A	Solar PV	170	4.59

Round 8 (Noor Midelt I)	2018	800	N/A	CSP and PV	800	7 (CSP-PV)
Round 9 (Noor Midelt II)	2019 (re-tendered in 2021)	230	N/A	CSP and PV	N/A	Yet to be awarded
Round 10 (Noor II PV, phase 1)	2022	400	N/A	Solar PV	333	N/A
Round 11 (Noor Midelt III)	2022	400	N/A	Solar PV	N/A	Yet to be awarded

Table 11: Overview of Morocco's renewable energy auction key implementing agencies

Policy and regulation guidelines	Agency for the Development of Renewable Energies and Energy Efficiency (ADEREE)
Regulatory authority	Agence Nationale de Régulation de l'Energie (ANRE)
Procurer	Solar: Moroccan Agency for Solar Energy, now known as Moroccan Agency for Sustainable Energy (MASEN) Wind: Previously Office National d'Electricité (ONEE), but now MASEN
Off-taker	Agency for the Development of Renewable Energies and Energy Efficiency (ADEREE)

3.2.5.1 Design

Morocco has two auction programmes for renewable energy projects: the Integrated Solar Energy Project, also known as the Noor Solar Plan, and the Wind Energy Programme for contracting wind capacity (Kruger et al., 2018b; Roberto & Karen, 2019). The tenders are designed as sealed-bid, pay-as-bid, technology-specific, two-stage auctions. The auctions are generally site-specific, with sites being secured and prepared (including grid provision) by a government agency (Kruger et al., 2018b; Luigi et al., 2016).

The prequalification phase requires bidders to demonstrate their experience, as well as their technical and financial capacity, to develop and operate the renewable energy project. As part of this stage, bidders are also required to post bid bonds (AURES, 2019; IRENA, 2013). Prequalified bidders are invited to the evaluation phase where they submit their bids, including a proposed price for the energy generated by the project, and other technical, financial, and industrial integration (e.g. local content requirements) details (AURES, 2019; IRENA, 2013). For example, in the NOOR I tender (2016), a 42% local content portion was included. Winners are selected based on their performance in the evaluation phase, with the lowest offers typically favoured to win the auction (AURES, 2019; Hochberg, 2016).

The posted bid bond is converted into a performance guarantee for preferred bidders to ensure that projects meet their implementation obligations under the contract. Preferred bidders are provided with stapled concessional debt financing from multilaterals or development finance institutions (DFIs) (Hochberg, 2016). The government also provides a guarantee to hedge against off-taker payment default on the PPA contracts (AURES, 2019), whose duration is usually 20 years for wind, and 25 years for solar (PFL, 2023). PPA payments are indexed to the EURO and/or US$ and paid in Moroccan Dirham (MAD).

3.2.5.2 Implementation

Morocco's power sector experienced increased liberalisation following the 2010 reforms, but the fundamental structure and operation of the electricity market remains unchanged. The market is vertically integrated and based on the single-buyer model (Karim et al., 2017; Luigi et al., 2016; Mansita Njie, 2019). The National Office of Electricity and Drinking Water (ONEE) is the state-owned electric utility and is responsible for the production, transmission, and distribution of electricity (AURES, 2019). The Moroccan Agency for Sustainable Energy (MASEN) oversees and organises the implementation of the country's solar and wind energy auction programmes (Luigi et al., 2016). MASEN effectively acts as the procurer, while ONEE – the custodian of the physical transmission infrastructure – is the off-taker of power produced by the IPPs (AURES, 2019).

ONEE was initially responsible for organising wind auctions and procuring the resulting capacity, while the Moroccan Agency for Solar Energy – established in 2010 with a mandate to mobilise the necessary public and private finance for solar development – was responsible for solar power procurement (Karim et al., 2017; Mansita Njie, 2019). MASEN would sign back-to-back PPAs with preferred bidders, and ONEE. MASEN was not only the procurer of solar electricity, but also a minority equity partner (under a PPP) which mobilised the debt financing for the projects through multilateral and development finance funds borrowed by the Moroccan government.

Under the PPA, most technical and performance risks are assigned to the private parties involved in the project (developer and contractors). Meanwhile, all risks related to power market fluctuations, including price and demand, are assumed by MASEN. MASEN commits to procuring all the power generated at a fixed price throughout the duration of the agreement. MASEN also takes on the currency risk, given that the PPAs are indexed in dollars and euros (Karim et al., 2017; Luigi et al., 2016). In 2016, the Moroccan Agency for Solar Energy was restructured as the Moroccan Agency for Sustainable Energy (MASEN), with an extended scope to cover all renewable energy projects across the country, including wind power (Karim et al., 2017; Roberto & Karen, 2019).

3.2.5.3 Outcomes

Since 2010, seven renewable energy auction rounds have been implemented in Morocco, resulting in the procurement of 2,883 MW solar and wind capacity (IEA, 2016; PFL, 2023). Competition in the tenders have been modest. Many of the rounds were reasonably oversubscribed. However, most of them had one, or just a few, large consortia implementing all the projects. This outcome is not surprising given the importance of deep technical know-how in developing some of the more innovative technologies, such as CSP. For this reason, and in some cases, the Moroccan government encouraged bidders to include their EPC provider as part of the consortium shareholding structure (ONEE, 2012).

The build time for the contracted projects has been fairly reasonable. It took up to seven years for the projects contracted in the earlier tenders to reach financial close, but this lead time has been significantly shortened in recent tenders. It took barely two years for the most recent project (Round 5 – Noor Midelt 800 MW solar complex) to reach financial close after it was awarded. Morocco's tender prices have also twice broken the world record tariff for renewable energy. The third round of the tender (Projet Eolien Intégré) for wind power saw an average bid of around US$c 3/kWh, and a lowest bid of US$c 2.5/kWh, a world record at the time of the award (IEA, 2016). The fifth round (Noor Midelt Phase 1) broke the record for CSP-PV at US$c 7/kWh (Susan, 2019). These remarkable auction outcomes have established Morocco as a regional renewable energy leader and provides an example for other North African states.

04

Learning from Case-Study Countries

4. Learning from Case-Study Countries

The successes and failures of the investigated renewable energy auctions powerfully illustrate the importance of the contributing elements of success for IPPs at the country, project, and programme-levels, some of which are discussed in the following sections. Adhering to these principles explains why countries, such as South Africa, Mauritius and Morocco, have been able to attract competitive IPP investments through auctions, whilst others, such as Botswana and Ethiopia, have struggled to secure IPP funding. The key features and outcomes of the renewable energy tenders in the case-study countries are shown in Table 7.

Table 12: Main features and outcomes of renewable energy auction programmes in case-study countries

	South Africa	Mauritius	Botswana	Ethiopia	Morocco
Year of Introduction	2011	2011	2015	2016	2010
Auction Demand	18,894 MW (11 rounds)	244 MW (6 rounds)	Over 400 MW (6 rounds)	1,100 MW (3 rounds)	3,180 MW (7 rounds)
Technology	Solar PV, Wind, CSP, Biomass, Biogas, Landfill Gas, Small Hydro, and Battery Storage	Solar PV, Wind, and Battery Storage	Solar PV and CSP	Solar PV	Solar PV, Wind, and CSP
Procurer	Independent	Utility	Utility	Independent/Utility	Independent
Bidding stages	One	Two	Two	Two	Two
Site selection	Developer	Developer	Selected by government	Selected by government	Selected by government
Local content	40% min.	None	40% min.	15% min.	Up to 40%
Evaluation	Earlier – 70:30 (Price: ED), Recently – 90:10 (Price: ED)	Earlier – 70:30 (Price: Technical), Recently – 100% price	N/A	70:30 (Price: Technical)	N/A
PPA	20 years, 25 years for battery storage	Earlier – 20 years, recently – 25 years	25 years	20 years	20 years for Wind and 25 years for Solar
Credit-rating (Moody's)	Country, Ba2 Utility, B2	Country, Baa3 Utility, n/a	Country, A3 Utility, Baa3	Country, Caa3 Utility, n/a	Country, Ba1 Utility, n/a
Risk covers/ Guarantees	Sovereign guarantee	None	None	Sovereign & payment guarantees, & political risk cover	Payment guarantee, currency risk cover
Lowest price (US$c/kWh)	2.3	9.9	N/A	2.5	2.5
Currency	ZAR (indexed to US$)	MUR, USD, EUR	Pula (partially indexed to US$)	US$ (but payment in ETB)	MAD (indexed to EUR and/or US$)
Financial close	8,342 MW	105 MW	50 MW	No	1,841 MW
Commercial operation	7,064 MW	75 MW	No	No	690 MW

In summary, a brief evaluation of the elements that proved successful, and those that fell short in the context of the case-study countries, are described.

South Africa

South Africa's renewable energy procurement programme has witnessed successes and challenges. Its achievements, particularly in the early REI4P rounds, can be attributed to a mature capital market, policy clarity, consistent plans, effective government co-ordination, and a capable, well-resourced procurement authority. However, subsequent procurement delays have damaged investor trust, impacting upon the auctioneer's capacity, local manufacturing, and institutional rules. Furthermore, implementation challenges, including policy and investment uncertainty, grid access issues, and allegations of impropriety, have hindered the programme's progress and its ability to effectively address the country's energy needs. The energy crisis, characterised by frequent load-shedding, has had a detrimental impact on the economy; furthermore, Eskom's financial challenges and dependence on government bailouts pose additional risks. Trust, once gained, has been difficult to maintain, and this naturally has an impact upon investor confidence and the overall reliability of the power system. Nevertheless, the programme remains a critical component of South Africa's energy future, and its success is essential for the country's economic and energy security.

Mauritius

Mauritius has exhibited several strengths in its approach to renewable energy auctions. The presence of clear policy goals provided a solid foundation for renewable energy procurement. The country's auction programme was recognised for its transparency and competitiveness and featured well-defined rules and timelines, creating an equitable environment for all bidders. The credibility of the CEB as a procurement authority also played a pivotal role in attracting private sector investment. The strong interest from domestic and international investors, reflected confidence in the country's stable macro-economic foundations, bolstered by political stability and democratic governance. The practice of using both local and foreign currencies in bid submissions helped to reduce currency exchange risks, promoting stable and sustainable investments.

Despite its achievements, Mauritius has encountered some challenges in its renewable energy journey. Notably, instances of project abandonment highlighted issues with permitting delays, caused by inadequate site preparation, and financial challenges faced by developers. The absence of credit enhancement and risk mitigation support was not a deal-breaker for bidders due to the country's political and macro-economic stability. However, the availability of these products could have further enhanced investor confidence, considering the long-term nature of PPAs. Delays in implementing regulatory reforms, such as the establishment of a new regulator, is also a shortcoming of the sector.

Botswana

Botswana has faced numerous challenges in implementing its renewable energy auction programmes, but seems to be emerging as a viable investment destination. Botswana's inconsistent policy approach, coupled with changes in technology preferences and auction types, has created confusion and uncertainty among investors. Legal challenges to awards serve to further undermine confidence in the sector. On the positive side, the country has managed to generate substantial private sector interest and participation, thanks to its stable political environment and clear policy intent to promote renewable energy. To move forward and truly unlock its renewable energy potential, Botswana needs to adopt a more integrated, consistent, and supportive approach. A strengthened planning-procurement nexus, and co-ordination between generation procurement and the grid are vital steps to attract investment and translate auction programmes into tangible renewable energy generation.

Ethiopia

Ethiopia's renewable energy auction programme has shown promise in several aspects. Firstly, its economic growth, commitment to reforms, and regulatory framework development efforts enabled it to attract significant interest from the private sector. Additionally, established and experienced international companies participated in the auctions, demonstrating confidence in the country's potential. Lastly, support from international agencies played a crucial role in providing technical assistance, advisory services, and financing support to boost investor confidence

in the process and sector. Despite these positive developments, Ethiopia faced significant challenges. Political and institutional instability due to ongoing reforms disrupted decision-making and created uncertainty. Ethiopia's centralised and tightly controlled approach to development hindered collaboration with the private sector, and a lack of trust in foreign investors resulted in limited communication and collaboration. Currency risks, including concerns about foreign exchange guarantees, undermined investor confidence and ultimately led to the withdrawal of international support. Finally, the lack of co-ordination and delays in decision-making amongst, and between, implementing institutions and decision-makers were additional obstacles. Addressing these issues will be crucial for Ethiopia's future success in the renewable energy sector.

Morocco

Morocco's experience stands as a valuable model for other nations in the Maghreb region aiming to embark on a renewable energy expansion journey. The country's renewable energy auction programme has exhibited several key strengths which have contributed to its success. Most importantly, political commitment, backed by a clear policy framework, have been pivotal in the country's transition to renewable energy. Furthermore, clear and ambitious renewable energy targets, supported by effective policy implementation and a commitment to liberalise the electricity market, have provided a robust foundation for renewable energy development. Government support through guarantees, and an investor-friendly environment have also reduced perceived risks and attracted financing.

4.1 Country-Level Factors

4.1.1 Investment Climate Which Attracts IPP Investment

The IPP literature posits that a favourable investment climate, which leads to both increased investor interest (thereby improving competition), and a lower cost of capital (through improved sovereign credit-ratings), should ideally have a number of macro-economic fundamentals in place. These include low inflation rates, moderate national-debt levels, strong national wealth (GDP/capita), a large economy and well-developed, deep local capital markets. Property rights, contract enforcement and the integrity of the procurement processes should, furthermore, be protected by a strong, independent judiciary. Also relevant, are high levels of economic growth, an educated and productive labour force, tax incentives, low corruption levels and political stability (Eberhard et al., 2016b; Eberhard & Gratwick, 2011; Vaaler et al., 2008; Woodhouse, 2005b).

The analysed cases broadly support the importance of these factors in determining investment interests and, to some degree, outcomes. All the investigated cases feature either significant levels of economic growth (e.g. Ethiopia, Botswana, Mauritius, & Morocco), and/or macro-economic stability (South Africa). This, in turn, leads to significant investor interest in their respective auction programmes. Ethiopia had one of the highest economic growth rates at the time it organised its tenders. Botswana, Mauritius, Morocco and (until recently) South Africa featured some of the best sovereign credit-ratings in Africa.

In practice, this saw Botswana attracting more than 100 bidders for its numerous attempts at renewable energy auctions, while Mauritius was able to stimulate significant levels of competition in its auctions, despite a relatively small market. South Africa maintained significant private sector interest in its sector in large part due to the size of its economy and the support of the well-developed local financial sector, despite several challenges in the sector and the broader economy.

This is not to say that economic conditions automatically create favourable price outcomes. The continent is home to a number of competitive auction price announcements made amid deteriorating economic conditions (e.g. GETFiT Solar in Zambia at US$c 4.9/kWh). However, some level of economic stability is necessary to ensure that these competitively-priced bids are realised as illustrated by the eventual undoing of the initial Zambian GETFiT programme's solar bids. Ethiopia's inability to realise any of its competitively-priced IPP investments is largely due to the country's balance of payments and resulting foreign exchange availability problems. These issues have been

exacerbated by the multi-year state of emergency and growing unrest, which is not only making it more difficult for awarded projects to secure funding, but is also having an impact on economic growth more broadly, constraining new funding.

4.1.2 Enabling Policy and Regulatory Environment

Beyond the investment climate, the context for accelerated and sustained IPP investment is further strengthened by an enabling policy and regulatory framework that should, at the very least, make space for the private sector's participation in power generation. This is enabled by a regulatory framework of IPP legislation which allows private investors to generate and sell electricity. It also ideally clarifies the roles of private vs. public sector entities, and specifies how, and by whom, IPPs should be procured (Eberhard et al., 2017; Eberhard & Gratwick, 2011; Urpelainen & Yang, 2017). This enabling framework is further strengthened by means of policies that clarify governance arrangements for state-owned utilities and the presence of an independent sector regulatory agency. An independent and capable regulator, which is not dependent on government funding and is able to make its own staffing decisions, can play an important role in ensuring the sector's financial health through setting cost-reflective consumer tariffs; furthermore, it can streamline IPP investments by implementing transparent, predictable generation-licencing and PPA approval mechanisms (Eberhard et al., 2016b; Kapika & Eberhard, 2013).

South Africa's experience shows that policy objectives and targets alone are not sufficient to attract investments. Renewable energy targets were in place for almost a decade before the introduction of the REI4P, but these did not result in any new investments. The initial success of the REI4P was the result of a clear policy on the role of renewable energy, and how it was going to be procured and connected to the grid. The certainty which surrounded the REI4P in the beginning has been materially diminished: the lack of clear decisions, changes in top leadership positions, threats to renegotiate prices and inconsistencies in the institutional setting and procurement rules and processes have collectively contributed to a riskier investment environment for the country.

Ethiopia's situation is similar to South Africa's recent experience: the country's ambivalent stance on private sector participation in the broader economy, and the energy sector in particular, has resulted in a lack of co-ordination, poor communication and slow decision-making, thus ultimately derailing the promising auction programmes. Whilst Botswana has established renewable energy targets, the specific policies required to realise those targets are largely absent. This lack of clarity regarding the quantity of renewable energy to be contracted within a specific time-frame, the method of procurement, and the required technologies, have impeded the country's progress in meeting its renewable energy goals. Many of the key regulations required for successful project implementation were also still in the early stages of development when the country ran most of its tenders, resulting in considerable regulatory gaps and risks for investors. The government of Mauritius, on the other hand, set clear targets for renewable energy generation and developed a well-defined policy and regulatory framework to encourage investment in the sector; this provided a clear path to market and the policy consistency required by investors. Morocco similarly backed its renewable energy ambitions with the relevant legal framework and reforms that progressively opened up the market to private sector players and competition.

Overall, a country's energy policy framework needs to include clear objectives and an implementation strategy which is linked to electricity planning and timely procurement if it is to realise successful investment outcomes.

Political will has also emerged as a key determinant of outcomes, as it ensures that policy and reforms are translated into tangible action, even in challenging investment circumstances. The Moroccan government (the king) demonstrated a strong commitment to renewable energy development and set ambitious targets for the sector. This unwavering commitment helped to create an environment conducive to renewable energy investment and sent a clear message about the country's genuine renewable energy aspirations. South Africa's decade-long RE IPP procurement experience powerfully illustrates how political will (or, rather, the lack thereof) can make or break the auction programme. Political support played a crucial role in launching the REI4P, but was severely diminished, as the programme became the site of fierce contestation about the country's energy future; REI4P was perceived as a threat to the powerful interests in the coal and nuclear sectors. The resulting procurement impasse undermined investor

confidence and created uncertainty regarding the programme's future. Ethiopia's experience also emphasised the importance of political will, but showed that such support must be complemented by clearly mandated and co-ordinated leadership.

4.1.3 Planning and Procurement Nexus

Ideally, a regularly updated power sector expansion plan should project demand, establish a system reliability standard, select the technologies that can meet demand at the lowest cost (including alternative scenarios) and make clear the basis on which new-build opportunities are to be allocated to either the private sector, or to state-owned utilities. To be effective, the plan needs to be translated into international competitive bidding rounds on a timely and regular basis. The planning and procurement functions should preferably be automatic – which involves plans being frequently updated as a matter of course and translated into procurement rounds without requiring political approval (Eberhard et al., 2017). This approach aligns with the notion that minimizing political decision-making in the process enhances predictability and reliability, as it relies more on technical planning and procurement methods. It is important to acknowledge that political guidance and co-ordination may still play a significant role in promoting decarbonisation, especially in light of the comprehension and acceptance of global environmental imperatives. Nevertheless, renewable energy sources have now generally been proven to be the least-cost source of electricity.

This ideal framework was not in evidence in any of the case-study countries, and plans have generally failed to keep up with price and technological developments. South Africa's renewable energy auctions generally followed ministerial determinations, which were based on an Integrated Resource Plan (IRP), considered to be robust compared to most of its regional counterparts. A strong connection between planning and procurement existed in the earlier REI4P rounds, and contributed to the tenders' success. However, lengthy delays between the 2011 IRP, and subsequent 2019 IRP, resulting from contestation around the plan's outcomes, has ultimately produced a plan which is disconnected from a rapidly changing power sector and deepening energy crisis. The rigidity of the IRP has effectively restricted the market's ability to respond flexibly and promptly to demand, ultimately necessitating unsuccessful emergency procurement. The recent absence of grid expansion investment and co-ordination is also limiting competition in the country's renewable auction, as bids in high-resource areas are being overlooked due to network constraints.

Ethiopia possessed a five-year generation expansion plan, but the capacity addition targets were considered unrealistic, thus undermining its legitimacy for investors. The implementation of the plans has also been uncoordinated which was evident in the frequent revisions of the tendered projects and volumes in its procurement programmes. Botswana published its first IRP in 2020, which paved the way for the procurement of 235 MW solar PV, 200 MW CSP and 50 MW wind by 2027, as well as 300 MW of new coal. However, the plan lacked sufficient robustness in terms of infrastructure expansion to meet the present targets. There has also been little to no co-ordination between generation procurement and the grid, an issue that requires careful assessment due to the power system design, where the RE-rich region is constrained by the absence of flexible generation. Botswana also does not possess a grid code with which to align and manage network use and potentially new IPP connections. The planning-procurement link in the country needs to be strengthened for its power sector plans to provide the investment certainty needed for significant project pipeline development.

4.2 Programme-Level Factors

4.2.1 Auction Design Built on International Best Practice

A well-designed renewable energy auction programme should be fair and transparent; encourage competition; appropriately allocate risks between the government and private sector; include high-quality, bankable documentation and contracts; possess robust evaluation and selection criteria, and speak to the realities of the host country.

4.2.1.1 Ensuring effectiveness

Auction effectiveness can be strengthened by using appropriate qualification criteria, penalties, and access requirements. Qualification criteria can be classified as either physical, such as permits, land, transmission access, equipment standards, projected project performance or financial, for example, bid bonds. These requirements would need to be met for a bid to be considered compliant. The aim of using qualification criteria is to ensure that submitted projects are well-prepared, and that bidders are committed. Qualification criteria serve an important purpose in establishing a level and equitable playing field for all bidders. When appropriately designed, these criteria not only promote fairness but also contribute to improved project performance. High qualification criteria can lead to higher project-realisation rates, but can also reduce competition, which can lead to higher prices. A good auction design seeks an appropriate level of qualification (Del Río, 2017; Ferroukhi et al., 2015; Haufe & Ehrhart, 2018; Kreiss et al., 2016; Welisch, 2018).

Auction effectiveness can also be increased through using auction access criteria (Haufe & Ehrhart, 2018; Kreiss et al., 2016), such as requiring that bidders (or in the case of a special purpose vehicle, one or more of the shareholders) have a minimum level of prior experience and/or capacity, usually covering technical and financial areas. In general, auction access requirements aim to limit participation to competent bidders, resulting in realistic prices and high realisation rates. Staged bidding can be used to potentially decrease transaction costs for both auctioneers and bidders by screening-out unqualified bidders in a pre-qualification stage before they submit full bids, although this can reduce competition.

There are two main ways in which bidders' capacity is normally assessed. The first is through interrogating reference projects, which meet a minimum size requirement and are located in specific regions. The second is by bidders providing proof that they have either a track record of raising financing for similarly sized projects, or have sufficient assets to finance projects themselves. Auctioneers can, of course, also use both methods. Bidders can also be asked to provide proof of proposed EPC and O&M contractors' track records (usually reference projects) (Kreiss et al., 2018).

The empirical evidence suggests that setting high bid/project preparation physical qualification criteria can support high project-realisation rates, but at a potentially significant cost, at least initially, if auction volumes are too generous: after all, few projects are likely to be prepared enough to meet these criteria during the first bidding rounds, thereby reducing competition and pushing-up prices. South Africa's first auction rounds were, for example, undersubscribed, and delivered projects at high prices, in large part thanks to the demanding qualification criteria intended to ensure the timely realisation of projects which were heavily influenced by lender requirements. The qualification criteria included proof of land ownership, environmental and other permits and, most importantly, resource data. The resource data requirements meant that projects, which had not started measurements at least 18 months prior to the submission deadline, were unable to submit qualified bids, thus drastically reducing the number of eligible bidders in the first rounds.

This impact was mitigated over time, as more projects were prepared for later rounds, thereby increasing competition. The impact could also have been mitigated in initial rounds through the provision of project-sites, along with grid connections, permits and relevant data (for example, resources, geotechnical studies, and so on). This approach worked well in Morocco, leading to low prices and very quick realisation timelines. Evidence from other world regions, such as India, the Middle East and North Africa, appears to support the competition-enhancing, cost-reducing, timeline-shortening impact, even for large volumes, such as solar parks, at least in the initial rounds. The evidence also highlights the importance of a well-prepared and serviced-site-provision approach (Dobrotkova et al., 2018), and the need for a consistent, transparent planning-procurement framework that provides market predictability. If a site, and its associated data, is not prepared in line with bidder requirements, it can increase project risks and realisation timelines (Kruger et al, 2019).

Project-site selection and preparation remains a key challenge for African auction programmes and represents a growing risk for investors. Procurement programmes tend to overlook the importance of considering environmental and social performance during site selection and preparation processes, leading to inadequate assessments of

factors, such as wildlife presence and resettlement needs. Moreover, the initial evaluation of these elements might be too superficial, failing to capture their full significance in project development. The process of making land available, and securing it, can also give rise to bankability issues. While banks readily accept land ownership or lease agreements as viable collateral, the inclusion of usufruct rights (right of use) can introduce complexities. Additionally, it is important to consider the land required for the transmission line and access road within the same context. Despite often being neglected, these elements come with their own set of challenges. Dealing with multiple landowners, potential interference with local livelihoods, and the risk of political unrest are common obstacles associated with the acquisition of land for transmission lines and access roads.

The importance of site selection in the procurement process was apparent in the investigated countries. South Africa's experience primarily stemmed from constraints in the transmission and distribution network. In certain areas where renewable resources are abundant, the grid capacity has reached its maximum capacity. In addition, there are strong justifications for encouraging renewable energy projects in specific regions due to grid stabilisation and socio-economic impact concerns.

The sole competitively tendered wind farm in Mauritius never materialised, mainly due to site permitting delays. The project-site was provided by the government as part of the auction process, but was later discovered to have been situated on state land, with a national forest and near a catchment area. In Botswana, the absence of generators able to adequately provide system services in the southern region of the country poses operational challenges for solar and wind power integration due to the limited ability of renewables to provide some of these services, essential for security of supply. Yet, the country rolled out tenders for renewable power in this region without adequate assessment of the overall system needs. Mauritius provides useful lessons, having conducted system-studies on the capacity of the network, to handle additional renewables and the system needs required to support these generators (e.g. new battery installations) prior to initiating new auctions.

The Metehara (Round 1) tender in Ethiopia showcased the importance and difficulty of properly selecting and preparing a project site. The government-led site selection process presented significant challenges in the realisation of the project. Bidders were required to bid on a pre-selected site where the land lease agreements were yet to be finalised. This agreement never materialised, resulting in the selection of a new site, which again proved complicated to explore due to the potential displacement of hundreds of households. Ethiopia's and Mauritius' initial experience highlights the importance of leveraging private sector expertise and experience to enhance the effectiveness of site-selection processes and increase the chances of successful renewable energy auctions. Beyond the standard physical bid/project preparation qualification criteria normally assessed, the requirement for signed letters of support, or term sheets, from project equity investors and lenders also appears to be an important element of the bidding process. Investors were unlikely to provide these support letters or term sheets without having conducted due diligence on bids to ensure that projects were well prepared and sufficiently low risk by the time of submission to ensure prompt realisation.

Requiring bid bonds appears to have been necessary for timely project realisation, although the actual level of bid bond requirement has less influence on auction effectiveness (realisation), and efficiency (prices). The impact of the levels of bid bonds on competition levels also appears to be negligible relative to other factors, such as the size of the market, technical qualification criteria and the perceived capacity of the auctioneer. Evidence from other world regions, such as Germany, suggests that setting bid bond levels too low can lead to opportunistic bidding behaviour, thus lowering realisation rates and pushing-up costs as awarded bidders abandon bids (and opt to pay the bid bond) to secure higher prices in undersubscribed bidding rounds (Kitzing et al., 2021).

The auction literature generally views these qualification criteria as lowering competition by increasing the barriers to entry, which means that fewer bids are submitted (Del Río, 2017; Ferroukhi et al., 2015; Haufe & Ehrhart, 2018; Kreiss et al., 2016). While the case-studies illustrate that this is generally true when looking at the number of bids submitted, it is also clear that the impact on competition levels is not straightforward. If anything, the cases have shown that competition is driven as much, if not more, by the quality of competition – meaning the relative experience, financial health and size of bidders – as by the quantity of competition.

Stronger bidders view auctions with few access or qualification requirements, or indeed penalties, as risky, since the lack thereof will probably expose them to competition from less experienced bidders who are more likely to submit unrealistic bids, thereby decreasing the likelihood that the costs of bidding from the stronger bidders will be recovered through being awarded a project. Stronger bidders are thus less likely to submit bids for these programmes, thereby lowering the quality of competition and the likelihood of securing competitively priced, realistic projects.
All the cases illustrate that having stronger bidders as part of the bidding pool not only increases competitive pressures between bidders, but also lowers prices through these bidders' negotiating power relative to suppliers and service-providers. Prices are also lowered through the ability of stronger bidders to supply more elements of the project development, construction, and operations value chain in-house, thereby diversifying and increasing their sources of revenue (Kruger et al., 2021).

The use of penalties, such as performance bonds or liquidated damages clauses, and incentives, such as early connection payments, are further intended to encourage timely project realisation and improved project performance, technical and otherwise. However, they can also lead to higher costs, through increased risks and lower competition/market concentration, by acting as barriers to entry, thereby increasing prices (Ferroukhi et al., 2015; Haufe & Ehrhart, 2018; Kreiss et al., 2016; Kruger et al., 2021). Only South Africa's auctions appear to have levied penalties on projects by means of a punitive reduction in the PPA term for project implementation delays, as well as monetary penalties for underperformance in key socio-economic development areas. Ethiopia's auctions were considered to have had numerous and exorbitant penalties which were partly responsible for the depressed number of bid submissions.

4.2.1.2 Setting and Dividing the Auction Volume

Setting auction volumes, and dividing them between projects, bidders, technologies, and spreading them across time, is an important part of the auction design process which impacts upon competition, costs and effectiveness. Volumes should ideally be based on a least-cost, regularly updated, rational power expansion plan that matches demand with supply in a cost-effective manner (Eberhard et al., 2017). Theoretically, large auction volumes can attract more competition (Ballesteros-Pérez et al., 2016; Friedman, 1956), but if volumes are set too high, the auction runs the risk of being undersubscribed, resulting in low competition levels and high prices. A design option to address these concerns is to modify the auction's total volume, based on the available supply, to stimulate competition and avoid high-priced outcomes. This approach has been employed in Brazil, but is uncommon in Africa. Before the auction takes place, two specific parameters are established, but not revealed to the participants: *Total Demand*, which signifies the maximum amount of energy that can be procured across all technologies, assuming there is enough supply to meet it; and *Demand Parameter*, used to ensure that there is a minimum level of competition in the auction (AURES, 2016). Auctioneers can also decide to limit the amount of capacity or energy that can be awarded to a single bidder or project. Such limits can increase the costs of energy through limiting economies of scale and, in some cases, thus deterring bidders, but are often included owing to energy security considerations.

Ideally, auction volumes should also be bid-out over a number of subsequent rounds (Eberhard et al., 2014; Ferroukhi et al., 2015).This has been shown to increase competition, and lessen the impact of unsuccessful bids, by providing these bidders with the opportunity to resubmit bids in later rounds. Auction rounds should ideally be predictably scheduled to enable the development of a pipeline of quality projects that will increase, and maintain, competition-levels over time. The experience of South Africa, Morocco and, to a more limited extent, Mauritius, supports the competition-enhancing, cost-reducing impact of auction rounds.

Finally, auctions can be technology-neutral, which means that all technologies, RE and others, compete against each other, or the volume can be divided according to specific technology 'bands'. While a technology-neutral approach might lower auctions' price outcomes by awarding projects only to the most cost-competitive technologies, this needs to be done in a way that matches the power system's needs to the technical characteristics of different technologies to lower the overall cost to the system. A technology-specific approach, especially if in line with a policy

framework for renewable energy adoption, can increase energy security, improve system resilience and lower the overall costs for the system, by optimising the complementarity of various technologies. However, it is likely to lead to lower competition (De Mello Santana, 2016; Gawel et al., 2017; Haelg, 2020). South Africa's experience with the nominally technology-neutral RMI4P shows that ensuring a truly technology-neutral design is not easy to achieve, and can lead to sub-optimal outcomes. Nevertheless, the increased penetration of variable renewables in these African power systems is going to necessitate increasingly sophisticated auction designs for a range of products and services beyond the 'energy-only' auctions currently dominating the sector.

4.2.1.3 Determining winners

Auctioneers need to make several decisions regarding their approach to determining winners, including the auction format (sealed bid vs. descending-clock), the pricing rule (pay-as-bid vs. uniform pricing), and the criteria used for bid evaluation and scoring. Auctioneers also need to decide whether to set and/or disclose ceiling prices, also called price caps or reserve prices. A sealed-bid auction[1] format offers fewer opportunities for collusion since bidders cannot signal to each other through the bidding process; however, a descending-clock auction[2] can, theoretically, increase the realisation rate of projects since bidders are better able to benchmark their costing assumptions against their competitors (Haufe & Ehrhart, 2018; Hubbard & Paarsch, 2016; Klemperer, 2004). While pay-as-bid[3] and uniform[4] pricing approaches should, theoretically, deliver equivalent results, practice has thus far shown that the pay-as-bid rule generally delivers superior outcomes, mainly because it is more easily understood, and is seen as less risky, by auctioneers and bidders alike (Del Río, 2017f; Haufe & Ehrhart, 2018; Maurer & Barroso, 2011).

All the case-study countries elected to make use of the simpler and more straightforward sealed-bid, pay-as-bid approach. This decision seems necessary for competitive price and timely realisation outcomes for auctions in new contexts – considering that the technologies being procured are new in those contexts – where auctioneers want to minimise the risks of getting it wrong. The sealed-bid, pay-as-bid tendering format might be new to the power sector, but it is well established in most public procurement programmes and thus offers a known, less risky approach for entities embarking on their first RE auctions and, as a result, increases competition levels. As renewable energy auction programmes and power markets in the region mature, it is possible that we will witness more use of descending-clock or hybrid style approaches, such as those in Brazil and India, for example (Aquila et al., 2017; Rego & Parente, 2013; Shrimali et al., 2016b).

Ceiling prices, also called price caps, generally protect the auctioneer, and thus electricity consumers, from securing projects at prices that are considered too high; although how one should go about determining acceptable price levels is as much a political decision as a technical one. These prices can be set following an open consultation process. For instance, in Namibia's maiden tender, prospective bidders were required to provide an indication of their potential project price level, which eventually informed the auction's price ceiling (Wikus Kruger et al., 2019). If ceiling prices are set too low, they can depress competition and lead to very few projects being awarded which, in turn, can threaten energy security. Auctioneers also need to decide whether to publish ceiling prices which might lead bidders to anchor prices around these levels, but could also increase competition (Del Río, 2017; Haufe & Ehrhart, 2018; Hubbard & Paarsch, 2016).

Only South Africa has used price caps, and then only in the first three rounds of the REI4P. Part of the reason for dispensing with price ceilings in later rounds was the fact that bidders tended to bid close to these levels, rather than push for lower price boundaries. International auction results in Germany, Brazil and India, for example, show

[1] In a sealed bid auction, participants submit their bids privately and without knowledge of other participants' bids. These bids are typically placed in sealed envelopes, or submitted electronically. At the end of the auction, all the bids are opened simultaneously, and the lowest-priced bidder wins the auction.

[2] In a descending-clock auction, the auctioneer starts with a high asking price and gradually decreases it over time. Participants indicate their willingness to accept the current price by signalling their interest. The auction continues until there is no further interest from participants, and the final price at which the last bid is accepted becomes the winning price.

[3] In a pay-as-bid auction, each participant is awarded the quantity they bid for, at the price they bid.

[4] In a uniform pricing auction, all the winning participants pay the same price, which is determined by the highest price needed to clear the market.

that undisclosed price caps remain necessary to keep prices from escalating, and to eliminate opportunistic bidding behaviour (Bayer et al., 2018; Bose & Sarkar, 2019; Grashof et al., 2020; Winkler et al., 2018b).

To determine winning projects, bids can be scored on price only, which is generally regarded as a theoretically more efficient option (Estache & Iimi, 2012), or on the basis of other criteria alongside price, such as socio-economic development commitments, technical quality, project preparedness, quality of equipment, and so forth. This serves to incentivise additional performance on these metrics beyond that which is stipulated as the minimum qualification criteria (Ferroukhi et al., 2015; Haufe & Ehrhart, 2018) (Table 6.7). In general, the use of additional awarding criteria is fraught with potential problems, such as a lack of transparency or sub-optimal outcomes (Estache et al., 2009). Nevertheless, amongst the case-studies, only the Scaling Solar programme, and recent tenders in Mauritius, chose to make use of price as the sole awarding criterion, showing that this is not necessary for either competitive pricing (as observed in Figure 9 and Figure 10), or timely project realisation outcomes (PFL, 2023).

The consequences of employing additional criteria in deciding bid winners is nevertheless mixed. The use of technical criteria, such as project performance or realisation timelines, as additional awarding criteria, appears to have delivered little additional impact. A project's contribution to system losses is, however, a potentially important technical evaluation criterion that is likely to be used more frequently given recent international trends (for example, Mexico), as countries grapple with integrating larger shares of renewables in their power systems.

The use of socio-economic development evaluation criteria appears to have delivered positive outcomes other than just competitively-priced energy, and is becoming increasingly ubiquitous throughout the region. Projects' commitments on key SED metrics in SA's REI4P have generally increased over the bidding rounds to levels at, or beyond, the targets[5] set by the IPP office. This has led to greater socio-economic development benefits for the country and local communities, as opposed to what would have been the case had these only been used as qualification criteria. There are questions about how well these commitments have translated into actual results (Baker & Sovacool, 2017; Davies & Morar, 2016; Marais et al., 2018; Stands, 2015; Wlokas, 2015; Wlokas et al., 2012), or whether they have allowed for gaming of the system, as well as the impact on pricing – there is a broad consensus that prices have been pushed-up, but it is not clear by how much.

Local content and ownership requirements can contribute to inclusive economic development by promoting the participation of local businesses and labour. However, it is important to carefully evaluate and transparently implement local content and ownership measures to ensure their effectiveness. Transparent implementation mechanisms can help ensure accountability and fairness in the application of these requirements. By carefully assessing and implementing these measures, IPP investments have the potential to not only generate renewable energy, but also foster inclusive economic development, empower local communities, and create a sustainable and equitable energy transition. It is worth acknowledging the trade-off between local content requirements and the total cost of capital. While these requirements contribute to the localisation of the renewable energy sector, they may result in higher project costs.

4.2.2 Auction Implementation Needs to Emphasise Trust

Beyond auction design elements, the literature and empirical cases further foreground the importance of trust, in the auctioneer and in the bidding process, as a determinant of competition levels which impact upon pricing, and the effectiveness of auctions, by attracting stronger bidders. The auctioneer also functions as a co-ordinator, or at least as a neutral third-party (honest broker), to help projects reach financial close and commercial operation deadlines. To earn bidder trust, the institution designing and implementing the auction should ideally be well-resourced and politically supported, capable, and perceived as having integrity (Eberhard et al., 2014; Mayer et al., 1995). The

[5] The REI4P RFP specified both threshold levels (that is, qualification criteria) and targets for SED indicators. Targets differed from thresholds in that not meeting them would not disqualify a project, whilst meeting them would result in a project being awarded the maximum number of points (at least in the initial rounds).

implementing team should ideally also be an agile and capable professional group, committed to institutional innovation (Boulle et al., 2015; Garud et al., 2007; Najam, 1995).

Bidders do not only need to trust the bidding authority, but also the bidding process. This trust is based on perceptions of the integrity, security, transparency and justice of the bidding process – in short, whether the programme and its outcomes are seen as fair and secure (Chiu et al., 2010; Zitron, 2006). Trust in the auction process can be built by incorporating public consultation, as demonstrated by Brazil and Mexico. In this approach, the auctioneer initiates a public consultation step within the bidding process, allowing stakeholders to review the auction rules and draft contracts. Bidders receive comprehensive information about the auction, encompassing firm rules, contracts, price caps, and the certified firm energy requirement (physical guarantee)[6] (Tolmasquim et al., 2020). Most of the African auctions reviewed featured dedicated bidder briefing meetings and formal clarification processes, although the comprehensiveness of the information shared during these processes generally left quite a number of questions unanswered. (Maurício T. Tolmasquim et al., 2020)

Nevertheless, the impact of the bidding process on competition levels and auction outcomes is best analysed over longer periods, as bidders' assessments of the auction process are mainly retrospective. With new auctions, bidders are unable to evaluate the perceived fairness of previous auction processes and therefore need to base their judgements on proxies and signals, such as the capacity and integrity of the bidding authority, the published auction rules, the quality of the RFP documentation (including the contracts), security measures governing the process, and the quality of communication with the market. The presence of an independent, credible, well-capacitated and well-resourced agency, responsible for designing and implementing the tender process, was a critical success factor in the South African and Moroccan procurement programmes. The creation of MASEN, the dedicated governing agency for solar energy in Morocco, played a crucial role in the successful management of the country's solar auctions. International organisations, such as the World Bank and the European Investment Bank, provided financial assistance, technical expertise, and knowledge to help MASEN create a successful and sustainable auction framework. These institutions also played a critical role in providing funding and technical support for Morocco's renewable energy tenders. Between 2011 and 2015, the renewable energy sector received the highest amount of new foreign direct investment in the country, totalling US$ 2.9 billion, mainly from multilateral development banks (Roberto & Karen, 2019). The financial backing from these institutions improved investors' confidence in the sector.

South Africa's IPP Office engaged a range of local and international financial, legal and technical advisors to offer technical assistance in the establishment and operation of the REI4P programme. The IPP Office was also staffed with a competent management team, as well as technical and legal experts, whose contributions were instrumental in the successful implementation of the initial REI4P rounds. The impasse in the country's auction programme created a funding shortfall and forced the self-funded unit to downsize its staff. Although the recommencement of new procurement rounds has opened-up funding opportunities for the IPP Office, the reduction in capacity and institutional memory has affected the overall performance of recent auctions.

Mauritius did not create a separate unit to manage its auction process. However, the implementing entity (CEB), was considered to have provided adequate technical support to bidders, and had designed a programme that was transparent and competitive, with clear rules and timelines, and rigorous evaluation criteria. This approach helped to create a level playing field for all the bidders and ensured that projects were awarded in a timely and fair manner, and at the right price. There are 'school fees' associated with designing auctions, especially the inaugural programme, which includes expanding the capacity of the procurer. Botswana initially failed to provide such support to its implementing institution, which subsequently led to the failure of several earlier tenders. It was only after seeking the assistance of multiple international and local advisors to address and mitigate potential risks in the auction process that the country achieved success.

Ethiopia struggled to adequately utilise the considerable assistance provided by the international community. USAID

[6] In Brazil, the total auction demand is intentionally kept undisclosed until the auction to minimise the possibility of collusion among participants.

provided advisory services throughout the procurement and development of the Metehara tender, even covering the costs associated with developing the PPA. The US Department of Commerce helped in strengthening the capacity of the PPP DG by offering support on PPP legislation. In collaboration with the World Bank, the Danish embassy and the Danish Energy Agency facilitated capacity-building initiatives focused on renewable energy auctions and project finance. The World Bank also played a key role in the second auction programme by utilising its Scaling Solar framework, but later withdrew its involvement.

Changes in the implementing unit in Ethiopia introduced uncertainty and ambiguity, leading to a disorganised and uncoordinated approach that has failed to yield notable private power sector investments, despite substantial support by various development partners and multilateral institutions. Between the auctions, the central role of the procurer, i.e., the state-owned utility, was replaced, or at least diminished, by the PPP Directorate General (DG), which comprises several key institutions, to improve the procurement process. However, this new PPP entity was considered to also lack the critical skills, resources and power to drive IPP investments. Further, the treatment of bidders in general was perceived to have negatively impacted upon investor confidence, as the procuring authority implemented several last-minute changes without extending the bid date specified in the RFP.

4.3 Project-Level Factors

4.3.1 Equity and Debt Providers

While the cost of capital is a key determinant of project prices for capital-intensive renewable energy installations, the IPP literature stresses the importance of the sources of capital – specifically equity and debt – for project sustainability. Equity providers (sponsors), as well as debt providers (lenders), should ideally have a strong track-record, in Africa and beyond, as well as a development mandate to help them withstand and navigate short-term pressures. It has also been posited that projects developed by development-oriented sponsors are also more likely to achieve balanced outcomes (between investment return and prices), thus strengthening a project's overall sustainability.

Finally, IPPs should preferably be financed by long-term, local currency debt to reduce prices and protect off-takers from foreign currency fluctuations (Eberhard et al., 2016b; Eberhard & Gratwick, 2011). The use of local currency financing remains an issue for international developers, due to risks including currency volatility, depreciation and inconvertibility. Furthermore, many African countries face challenges in accessing their local markets for long-term, competitively priced lending, primarily due to the limited depth of their capital markets. However, it remains crucial for these countries to prioritise and embrace local financing options whenever feasible. The cases of Mauritius and Botswana serve as an example where the use of local currency PPAs (indexed to inflation and/or US$/EUR) was supported within the limits of the local capital market. It is also important to acknowledge that international developers would normally factor-in the local currency risks in their risk-adjusted returns, which could result in a higher cost of capital. Likewise, while PPA revenue and debt can be realistically denominated in local currency, the EPC contract would normally not, creating a currency risk between tariff submission date, the signing of the EPC contract, and milestone payments under the EPC contract. Flexibility in the auction process could mitigate this risk, as in SA's case where currency adjustments are allowed (up to a certain level based on local content) between submission date and financial close.

Unlike many African countries, South Africa has been in the fortunate position of having sufficiently deep and well-developed financial markets which were able to fund its renewable energy build-out. The support from the financial sector has been crucial in ensuring the expansion in renewable energy investment, even as the country's, and Eskom's, sovereign credit-rating[7] has deteriorated. The frequent and predictable cycle of the initial programmes also allowed funders to become increasingly comfortable with the technologies and underlying contractual frameworks, leading to reduced cost of capital, as well as increased competition among lenders and equity investors.

[7] South Africa's credit-rating sits at Ba2 and Eskom at B2.

The provision of concessional finance through international financial institutions, such as the World Bank and the European Investment Bank (in Morocco), contributed to competitive price outcomes and gave other investors significant confidence in the programme.

4.3.2 Ensuring a Secure Revenue Stream: Off-Taker, Contracts and Risk Mitigation

As most IPPs are project-financed, it is essential that a project's revenue streams are adequate, predictable, and secure. Having a solvent, creditworthy off-taker of power is thus a key requirement for ensuring project bankability and long-term sustainability. Investors, including lenders, also require a fair allocation of risks in the project contracts – most importantly, the power purchase agreement – based on the principle that the entity best positioned and equipped to handle a risk should be the one allocated that risk. Remaining risks to the revenue stream, either because of credit risks posed by, for example, an insolvent state-owned off-taker, or because there are gaps in the contractual arrangements, need to be covered by risk mitigation and credit enhancement measures to ensure bankability: these measures include sovereign guarantees, liquidity support arrangements and multilateral, political-risk insurance products to ensure bankability (Eberhard et al., 2016; Eberhard et al., 2017; Eberhard & Gratwick, 2011).

In South Africa and Morocco, the use of high-quality, standardised and bankable documentation, such as the PPAs and IAs, as part of the RFP process, guaranteed security for non-discriminatory grid access and removed any barriers to entry for IPPs competing with the national utility in electricity generation. These well-defined contractual arrangements provided confidence and certainty to IPPs, promoting fair competition and facilitating their participation in the energy market. Morocco demonstrated the importance of ownership structure in risk management and allocation to facilitate post-tender financing and increase the likelihood of project delivery. The tenders favoured large consortia, and a PPP structure was also implemented to allocate risk between public actors (the government and DFIs) and private developers. The government's participation as a minority equity partner helped facilitate project development and mitigate the concerns of private investors regarding credit, as well as policy and regulatory risk.

Government shareholding comes with its own risks. State-owned entities typically provide equity in local currency, which may not align with the need for USD or EUR funding, creating a potential timing mismatch between equity close and the availability or disbursement of funds. Moreover, when a state-owned entity becomes a shareholder, it often holds a position on the board and wields substantial influence over the consortium's decision-making process. This arrangement can result in the state dictating a greater number of decisions and can also give rise to change of control issues. Potential buyers may be hesitant to enter into partnerships involving a state-owned entity, or the state itself may be reluctant to accept new partners, thereby reducing the attractiveness of second-hand projects. Furthermore, if the state receives a free-carry on its investment, it increases the investment cost for international developers. This, in turn, impacts upon the tariff and cost of supply to consumers, but does not necessarily affect the expected return for the developer. Ultimately, the effectiveness of government shareholding depends on the capacity and commitment of the relevant state entity.

In addition, credit and currency risks have been identified as detrimental exposures that require effective management to ensure the bankability and attractiveness of projects to investors. Sovereign guarantees in South Africa provided security to bidders that, should Eskom be unable to meet its payment obligations (which had become increasingly likely), the government would step-in and salvage the situation. The enduring uncertainty about the Ethiopian government's treatment of risk allocation was considered to be one of the major failings of the country's auction programme. Off-taker and currency conversion risks were the main risks for IPPs. The government provided sovereign guarantees (implementation/government support agreements) and payment guarantees to ameliorate off-taker risk. However, the absence of government guarantees of foreign exchange convertibility and transferability reduced the bankability of the projects and potentially scuppered the country's private sector-led energy ambitions. The Moroccan government helped to lower the risk for bidders mainly in the form of debt provision by MASEN. In one of the auctions, the Agency organised funding for developers using the country's first-ever green bond.

05

Conclusion and Recommendations

5. Conclusion and Recommendations

The success of renewable energy auctions depends on a combination of factors at the country, programme and project-levels. At the country-level, supportive policies and regulatory frameworks, and strengthening the planning and procurement nexus are essential for creating an enabling environment for auctions. At the programme-level, important success elements include designing the tender based on international best practice, and establishing trust and credibility in the procurement process. Project-level factors, such as the involvement of experienced equity and debt providers, secure revenue streams, and risk mitigation measures, also play a crucial role in auction effectiveness. The following section seeks to distil the main recommendations emanating from the preceding analyses to support the successful development and implementation of these procurement programmes.

5.1 Recommendations

To maximise the effectiveness of renewable energy auctions, the following recommendations can be made regarding country, programme, and project-level factors:

Strengthen Policy and Regulatory Frameworks: Despite it being possible to secure competitive prices through well-designed and implemented renewable energy auction programmes in challenging investment contexts, the long-term impact of economic instability, as well as policy and regulatory uncertainty, can quickly erode any gains made. For instance, frequent changes in government policies or regulations can create market uncertainty, making it difficult for renewable energy project developers to plan and make informed investment decisions. While development partners should do everything possible to ensure the success of auction programmes, this needs to be done in tandem with efforts aimed at improving the policy and regulatory environment. IPP legislation that defines the rights, roles, and responsibilities of private and public sectors and clarifies procurement procedures for IPPs (including licencing and permitting) are critical. In addition, given the importance of public utilities as ultimate off-takers, continued support to ensure independent, capacitated regulators in setting cost-reflective tarif fs should be a key priority. At the same time, it is essential that governments understand that it is impossible, and sometimes counterproductive, to predict and regulate all potential future scenarios in advance. Overly prescriptive regulations, while well-intended, can inadvertently hinder IPP initiatives by creating points of friction within the legal framework. It is therefore crucial that governments, as an initial step, continuously assess the feasibility of implementing projects within the existing regulations and remain receptive to necessary modifications.

Strengthen the Planning and Procurement Nexus: Countries should provide regularly updated power sector expansion plans which translate into international competitive bidding rounds on a timely and regular basis. A strong connection between planning and procurement ensures that tenders are aligned with current market dynamics and demand and provides the long-term certainty needed by the market to ensure the development of a pipeline of feasible projects. Countries should also specifically consider grid infrastructure assessments to inform new renewable energy investments, and grid expansion to accommodate new renewable energy sources and avoid network constraints. Developing a grid code to align and manage network use is essential for accommodating new IPP connections. Ownership of these plans often determines their impact, especially when it comes to investment decisions. It is therefore recommended that power system expansion plans be developed by local public sector officials – implying the need for continued and scaled-up support for capacity-building in this critical skills area.

Auction Design Based on International Best Practice and Continuous Learning: Overall, the level of qualification criteria and access requirements should be carefully considered to avoid deterring potential bidders. Continuously assessing and adjusting the evaluation criteria based on market conditions, auction volumes, and the level of pipeline project readiness in the country would lead to more balanced and sustainable future auction outcomes. Flexibility in the auction design is also important for adapting to changing circumstances and ensuring optimal outcomes. Most importantly, there is a need to engage with stakeholders, including industry players and investors, to gather feedback and continuously improve the auction evaluation process.

Build Institutional Capacity: Governments should invest in building the capacity of the implementing agency responsible for auction design and implementation. These agencies should have sufficient resources, expertise, and independence to effectively co-ordinate and administer the auctions. To be clear, the most appropriate auction implementation agency might not be the obvious choice on paper; this could, for example, often be the ministry of energy or the national regulator. However, the decision about the institutional setting of the implementation agency should primarily be a pragmatic one: which agency has both the proven capacity to implement a complex, private sector-facing programme, as well as the political support and independence to ensure timely, effective decision-making? This will differ from country to country. It might be the utility, as was the case in Namibia and Mauritius; a state investment holding company, as was the case in Zambia; or a wholly new, quasi-independent IPP procurement office, as was developed by South Africa. This implementing agency should have the necessary skills and expertise to manage the various advisors and consultants needed to support the programme. Capacity-building therefore needs to happen early in the process, before advisors are engaged, to ensure ownership and long-term success.

Governments should seek financial assistance, technical expertise, and knowledge-sharing from international organisations with development mandates to enhance the capacity of the auctioneer. This support will enhance the capabilities of the implementing institution, and ensure a transparent and competitive auction process. Importantly, continuity and institutional memory should be maintained within the auctioning entity to avoid disruptions and ensure effective implementation of subsequent auction rounds. Experienced staff should be retained to preserve knowledge and expertise.

Pay the 'School Fees': Designing and implementing a successful auction programme can be costly and time-consuming. Governments and their development partners should know this before embarking on a programme, and should invest the necessary time and resources to ensure successful outcomes. The continent is unfortunately littered with examples of poorly designed and executed procurement programmes that were often derailed by overly ambitious timelines and small budgets. Development partners can significantly improve the investment outcomes of these programmes by supporting committed host countries in designing and implementing a solid procurement programme, by mobilising resources and providing technical assistance in 'upstream' areas of support.

Build and Maintain the Market's Trust: Transparent and fair processes, coupled with effective communication and stakeholder engagement, can build trust and confidence in the auction system. In addition, the procurement programme should be designed with transparent and clear rules, timelines and evaluation criteria. Bidders should have confidence in the fairness and security of the bidding process based on these rules and the quality of communication from the auctioning entity. The implementing unit's roles and responsibilities should also be consistent, so as to enhance private sector confidence in the procurement process. The presence of a development partner in a significant capacity, supporting the government, or even leading a particular aspect of the programme, can go a long way towards building and maintaining trust in the auction process, especially in the initial process.

Prioritise Lenders and their Needs: Auction evaluation criteria should be designed to attract competition and ensure timely project realisation. Appropriate qualification criteria, such as legal, physical and financial requirements, can ensure that submitted bids are well-prepared and committed. Lender commitment remains the most important bid qualification criterion when it comes to ensuring bid quality and project realisation. Requiring signed lender commitment letters would theoretically ensure that these institutions have conducted rigorous due diligence assessments on the proposed projects. It is also crucial that auction designs carefully embed structured, transparent, and fair flexibility to accommodate bid adjustments based on observable and quantifiable changes in market conditions. Having such mechanisms in place can ensure that PPA prices continue to meet lenders' credit requirements, despite changing circumstances, as the ultimate measure of an auction's success lies not in contract awards alone, but in the tangible outcome in the form of electrons flowing through the grid.

Likewise, it is important to note that, unlike in South Africa where local market knowledge enables the 'binding' pre-approval of projects, this approach might not always be practicable in some markets and may pose challenges, such as creating barriers to entry, and increasing transaction costs, which are typically already high for bidders and lenders.

While acknowledging the value of pre-bid lender commitments, the auction process should allow for flexibility in modifying lenders' post-bid (as in the case of Mauritius), where 'binding' arrangements might not be feasible. This measure is vital, as the upfront transaction costs and project-size in many African contexts might make it unrealistic to finalise contracts at bid stage.

Furthermore, it is essential to involve lenders early-on in the auction design process to review relevant contracts and documents, while also scrutinising their viability against credit requirements. Incorporating lenders' feedback enhances the likelihood of securing finance for awarded projects and effectively implementing them. Auction designers should understand project finance and the role played by lenders in this investment framework, and this should naturally lead to a prioritisation of lenders' bankability requirements, as these are most often the ultimate arbiters of project success.

While giving due consideration to lenders and their requirements is crucial for ensuring bid quality and project bankability and realisation, it is worth recognising that factors outside the scope of auction design and implementation can have an impact on lender confidence. Senior lender commitment letters, a vital component of the bidding process, can exert significant burden on their treasury. Should project timelines encounter unexpected delays, lenders may perceive an elevated level of risk and contemplate withdrawing their commitments. It is worth noting that such decisions, which may result in project delays or impede financial close, may not necessarily indicate shortcomings in the auction process. Therefore, when formulating auction evaluation criteria and engaging stakeholders, it is important that auctioneers also acknowledge the polymorphic nature of project bankability and realisation from the lenders' perspective.

In summary: Renewable energy auctions remain one of the most promising tools for addressing the shortage of power in Africa. This has been proven repeatedly in markets as diverse as South Africa, Morocco, Zambia, and Senegal. Nevertheless, auction success is not a given, requiring significant investment at country, programme, and project-levels. Development partners can play a vital role in supporting the success of these programmes. This report provides several recommendations regarding the priority areas for support, based on lessons learned throughout the continent. However, it is important to consider the country contexts when applying these approaches as there is no umbrella formula that universally guarantees success. Each African nation presents its unique challenges, opportunities, and socio-political dynamics, necessitating tailored strategies that are informed by a deep understanding of the specific context.

A

Appendices

Appendix A: Private Power Procurement Trends in Africa

Historically, African countries have adopted diverse procurement mechanisms for contracting power projects. These methods can vary significantly from one country to another, reflecting differences in regulatory frameworks, economic conditions, and energy needs. As a result, categorising these procurement mechanisms across different countries and regions can be challenging. Nevertheless, it is commonly recognised that countries predominantly rely on three main methods: direct negotiations (DN), feed-in tariffs (FiT), and international competitive bidding (ICB)/ competitive tenders, to facilitate the selection of power projects (Alao & Kruger, 2020; Kruger et al., 2018b; PPP Knowledge Lab, 2021; USAID, 2019).

Direct negotiations, also known as unsolicited proposals, are arrangements where the developer of a power project negotiates the terms of the project, including the PPA, directly with the government or state utility company. This method can provide flexibility in customising agreements to meet specific project requirements. However, these unsolicited proposals might not feature as part of a country's long-term power sector plans and priorities. Likewise, the non-transparency of these arrangements could result in elevated tariffs and create opportunities for corrupt practices, which can erode the legitimacy of contracts (PPP Knowledge Lab, 2021). As an example, Ghana's expensive directly negotiated contracts diverted the government's attention from its long-term sector plans and objectives, resulting in costly overcapacity that threatens the country's macro-economic stability (Ackah, 2021).

Under a FiT scheme, the government incentivises investments in specific types of power projects, often by establishing an administratively-set price. These tariffs have been utilised, for instance, to promote the development of renewable energy projects employing certain technologies, or small to medium-sized power projects. Additionally, FiTs have been employed to stimulate investments in challenging market segments, such as mini-grids in rural areas. Unlike unsolicited proposals, FiT programmes typically encompass more than one project. They establish a predefined capacity (in megawatts) for procurement, or set a specific time-frame within which eligible projects can be developed and contracted. While participants in FiT programmes usually do not engage in competitive pricing, they do compete based on various policy-driven criteria, such as project speed, quality, and socio-economic development benefits (IFC, 2020; USAID, 2019; Wikus Kruger et al., 2018). FiTs, if not regularly updated to align with market dynamics, could suffer from outdated pricing that might no longer be adequate to serve, or attract, private investors.

Competitive tenders have gained popularity for procuring power projects. While the primary focus of this competition is typically on pricing, it may also extend to considerations, such as the quality of technology, project development speed, local content, or other factors aligned with the government's priorities. The specifics of competitive tenders can vary from one jurisdiction to another due to differences in regulatory frameworks and overarching procurement goals (AfDB, 2019b; Alao & Kruger, 2020; Kruger et al., 2018b; USAID, 2019).

Throughout the 1990s and 2000s, most renewable energy deals were directly negotiated (see Figure 10). In the 2010s, FiTs and auctions, falling under the umbrella of 'structured procurement programmes', began leading the way. Competitive tenders delivered significant new investments, but were initially concentrated in a single country, South Africa. During this period, FiTs were the most widespread RE support mechanisms, but eventually only delivered investments in a few countries: Egypt, Uganda, Namibia, and Kenya (PFL, 2023).

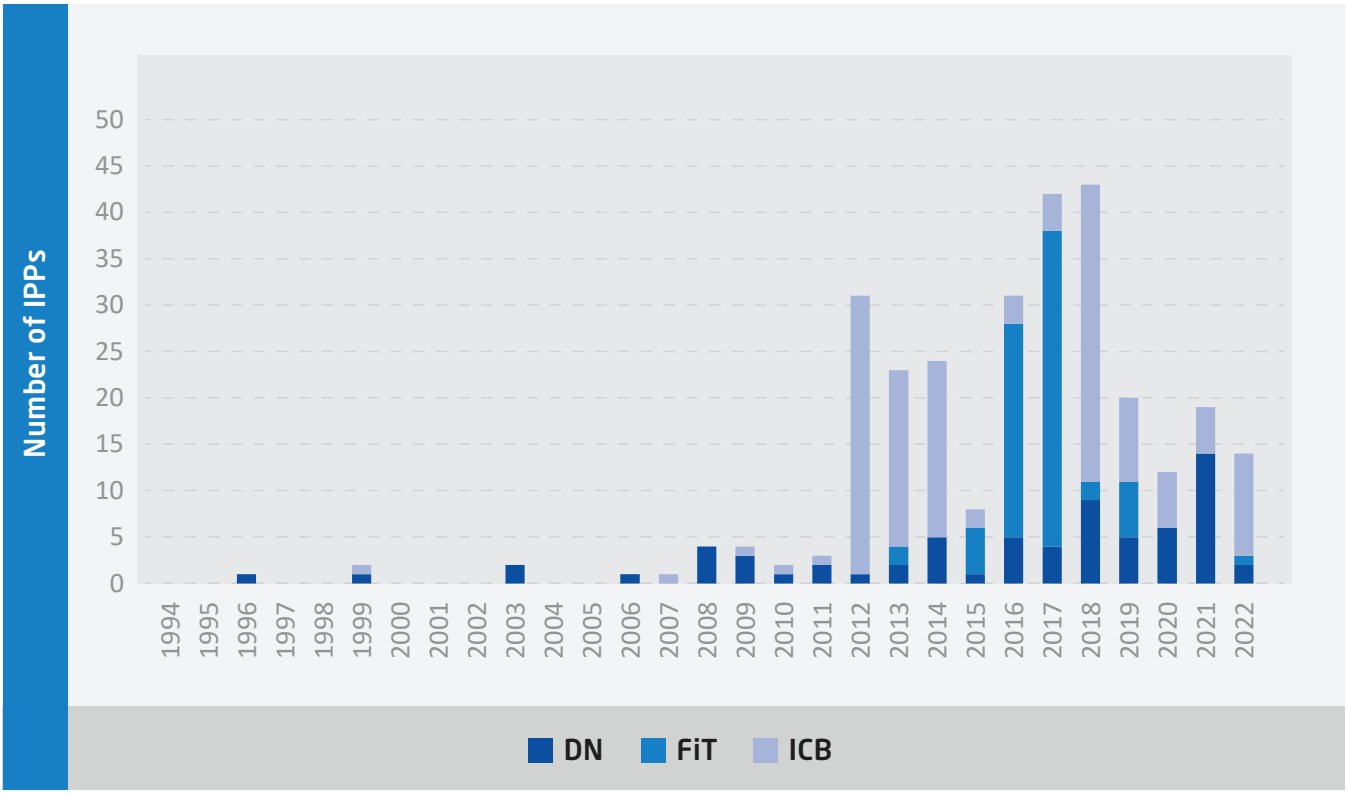

Figure 10: Renewable energy private power procurement trends in Africa
Source: (PFL, 2023).

Most countries have now transitioned to competitive tenders, with a renewable energy auction programme being implemented, or developed, in thirty countries. Most of the renewable energy IPP capacity on the continent has been procured using this method (AfDB, 2019b; Alao & Kruger, 2020; Kruger et al., 2018b; PFL, 2023). Nevertheless, directly negotiated deals known to have been more popular with conventional generators, such as OCGTs and CCGTs, have, in recent years, strongly permeated the renewable energy industry. In 2021, for example, most renewable energy IPPs which secured investments were directly negotiated, although it is important to note that these arrangements were set-up as a procurement programme, rather than a stand-alone unsolicited proposal. Under this framework, Zimbabwe and Angola together saw nine solar projects, totalling over US$ 500 million secure funding, some of which have now become operational (PFL, 2023).

In addition to the conventional procurement methods for renewable energy IPPs, it is crucial to recognise how the wave of power sector reforms is resulting in the emergence of new contracting structures which are reshaping the energy landscape. Several countries, including Burkina Faso, Guinea, Kenya, Madagascar, Mali, Morocco, Namibia, Nigeria, and South Africa, have enacted regulatory reforms permitting corporate PPAs between IPPs and private off-takers. These off-takers typically comprise energy-intensive sectors, including mines, manufacturing industries, agriculture, and data centres. Most of the corporate PPAs have been set-up as either behind-the-metre (embedded) installations, or projects that wheel power across the national grid (Kruger & Alao, 2022; PFL, 2023). Recent regulatory reforms in Ethiopia, South Africa, Namibia and Nigeria further allows power procurement by sub-national (local/state/municipal) government (Alao & Kruger, 2021). As a consequence, a number of countries are beginning to experience private off-take volumes comparable to that of public procurement programmes (Alao & Kruger, 2021; Kruger & Alao, 2022; PFL, 2023).

Corporate PPAs offer several advantages, including the potential to enhance the likelihood of successful project completion through the involvement of private off-takers in renewable projects. This outcome is, as a result of the shorter lead times, offered by these arrangements, circumventing challenges commonly associated with state-owned utilities. Likewise, corporate off-takers may exhibit more favourable credit risk profiles compared to government entities, provided that the PPA counterpart or guarantor is financially stable. These agreements typically target reliable counterparts who possess consistent electricity demand (base load profile), guaranteeing the revenue stream for developers, as well as creating opportunities for hybrid projects and higher tariff rates. Nevertheless, while

corporate PPAs might serve as a viable alternative for energy-intensive industries, it is crucial to emphasise the critical role of state off-takers in delivering electricity to a wide range of consumers, including residential, commercial, and industrial sectors.

Appendix B: Ongoing Renewable Energy Auctions in Africa

Country	Details of Auction Programme	Volume Requested (MW)	Status	PPA Length (Years)	Technology	Last Update Year
Benin	50 MW solar tender (MCA-Benin II)	50	Prequal	20	Solar, PV	2022
Botswana	100 MW solar tender	100	RFP		Solar, PV	2019
Botswana	Unspecified 6 x MW solar PV tender		RFP		Solar, PV	2022
Botswana	2 x 100 MW CSP tender	200	Prequal		Solar, PV	2022
Botswana	Unspecified 7 x MW solar PV tender		Prequal		Solar, PV	2023
Botswana	Maun, Lobatse, and Ghanzi solar tender		RFP		Solar, PV	2023
Burkina Faso	9 MW solar PV tender	9	RFP		Solar, PV	2020
Cape Verde	5 MW Boavista solar PV tender	5	RFP	25	Solar, PV	2019
Cape Verde	10 MW Santiago wind tender	10	RFP	20	Wind	2019
Cape Verde	10 MW solar PV tender	10	Prequal		Solar, PV	2020
Côte d'Ivoire	Scaling Solar I PV tender	60	RFP		Solar, PV	2021
eSwatini	Second Tranche Procurement Programme	40	RFP		Biomass	2019
Egypt	Kom Ombo CSP tender	100	Prequal		CSP	2018
Gambia	20 MW Banjul solar tender	20	RFP		Solar, PV	2020
Gambia	Solar PV Programme (UNDP)	10.5	RFP	20	Solar, PV	2021
Kenya	Olkaria VI geothermal tender	140	RFP	25	Geothermal	2020
Madagascar	Scaling Solar I PV tender	30 - 40	Prequal		Solar, PV	2017
Madagascar	210 MW solar tender	210	RFP		Solar, PV	2023
Morocco	Noor Midelt II tender - 230 MW solar power & 4600 MWh battery storage	230	RFP	25	Solar, PV	2023
Morocco	Noor Midelt III solar tender - 400 MW solar power & 400 MWh battery storage	400	RFP	25	Mixed (CSP, PV)	2023
Mozambique	PROLER - Inhambane	40	RFP		Wind	2020
Mozambique	PROLER - Manje	30	Prequal		Solar, PV	2022
Mozambique	PROLER - Niassa	30	Prequal		Solar, PV	2022
Niger	Scaling Solar I PV tender	50	RFP		Solar, PV	2022
South Africa	Battery Storage tender (BESI4P)	513	RFP		Battery Storage	2023

Togo	Scaling Solar I PV tender	60 - 80	RFP		Solar, PV	2019
Tunisia	500 MW wind tender	1000	Prequal		Wind	2018
Tunisia	70 MW Solar, PV tender - Authorisation regime Rd 5	70	RFP		Solar, PV	2021
Tunisia	8 x 100 MW Solar PV tender	800	RFP		Solar, PV	2023
Tunisia	4 x 75 MW Wind tender	300	RFP		Solar, PV	2023
Tunisia	2 X 100 MW Solar PV tender	200	RFP		Solar, PV	2023
Zambia	Scaling Solar II PV tender	50 - 250	RFP		Solar, PV	2017
Zambia	GETFiT (small hydro auction)		Prequal		Hydro	2019
Zambia	3 x 50 MW solar tender	150	RFP		Solar, PV	2022
Zimbabwe	235 MW solar PV auction	235	RFP		Solar, PV	2019

Appendix C: Moody's Long-Term Credit-Rating Methodology

Aaa	Obligations rated Aaa are judged to be of the highest quality, with minimal credit risk.
Aa	Obligations rated Aa are judged to be of the high quality and are subject to very low credit risk.
A	Obligations rated A are considered upper-medium grade and are subject to low credit risk.
Baa	Obligations rated Baa are subject to moderate credit risk. They are considered medium-grade and as such may possess certain speculative characteristics.
Ba	Obligations rated Ba are judged to have speculative elements and are subject to substantial credit risk.
B	Obligations rated B are considered speculative and are subject to high credit risk.
Caa	Obligations rated Caa are judged to be of poor standing and are subject to very high credit risk.
Ca	Obligations rated Ca are highly speculative and are likely in, or very near, default, with some prospect of recovery of principal and interest.
C	Obligations rated C are the lowest rated class of bonds and are typically in default, with little prospect for recovery of principal or interest.

Note: Moody's appends numerical modifiers 1,2 and 3 to each generic classification from Aa through Caa. The modifier 1 indicates that the obligation ranks in the higher end of it's generic rating category; the modifier 2 indicates a mid-range ranking; and the modifier 3 indicates a ranking in the lower end of that generic rating category.

Appendix D: SED as Qualification Requirement in South Africa's Tender

Economic development minimum thresholds for REI4P and SP-I4P bidders

Element	Description	REI4P		SP-I4P	
		Threshold %	Target %	Threshold %	Target %
Job Creation	South Africa-based employees who are citizens	50	80	-	90
	South Africa-based employees who are black people	30	50	-	60
	Skilled employees who are black people	18	30	-	50
	South Africa-based employees who are citizens from local communities	12	20	-	30
Local Content	Value of local content spending	40 (45 for Solar PV)	65	50	70
	Shareholding by black people in the seller (bidder)	12	30	-	40
	Shareholding by local communities in the seller	2.5	5	-	10
	Shareholding by black people in the construction contractor	8	20	-	30
	Shareholding by black people in the operations contractor	8	20	-	30
Management Control	Black people in top management	-	40	-	40
Preferential Procurement	B-BBEE procurement, as percentage of total procurement spend	-	60	-	70
	Qualifying small enterprises and SME procurement, as percentage of total procurement spend	-	10	-	20
	Women-owned vendor procurement, as percentage of total procurement spend	-	5	-	10
Enterprise Development	Enterprise development contributions, as a percentage of revenue	-	0.6	-	1
	Adjusted enterprise development contributions, as a percentage of revenue	-	0.6	-	1
	Enterprise development contributions on SMEs	N/A	N/A	0.5	1
Socio-economic Development	Socio-economic development contributions, as a percentage of revenue	1	1.5	-	3
	Adjusted socio-economic development contributions, as a percentage of revenue	1	1.5	-	3

SME Participation	Key components and/or equipment and balance-of-plant spend on SMEs	N/A	N/A	50	70

Economic development qualification scorecard for RMI4P and REI4P BWs 5 and 6

Element	Description	RMI4P in %		BW5 in %	BW6 in %	
		Threshold	Target	Threshold	Threshold	Target
Job Creation	South Africa-based employees who are citizens	65	90	65	65	90
	South Africa-based employees who are black people	40	60	40	40	60
	South Africa-based skilled employees who are black people	20	40	20	20	40
	South Africa-based employees who are black people with specialised skills (e.g. engineering, artisans, etc.)	N/A	N/A	10	10	20
	South Africa-based employees who are citizens from local communities	20	50	20	20	50
	South Africa-based employees who are black youth, aged 15 to 35 years	30	50	30	30	50
	South Afr ica-based employees who are black women	10	30	10	10	30
	South Africa-based employees who are people with disabilities	0	2	0	0	2
Local Content	Value of local content spending during construction and operation	40	75	40 (45 for Solar PV)	40 (45 for Solar PV)	65
	Value of local production and content of designated sectors, components, and products	As applicable, based on National Treasury Designated Sectors Circulars				
Ownership	Shareholding by citizens in the seller (bidder)	49	60	N/A	49	60
	Shareholding by black people in the seller (bidder)	30	40	N/A	30	40
	Shareholding by local communities in the seller (bidder)	N/A	N/A	N/A	2.5	5
	Shareholding by black women in the seller (bidder)	N/A	N/A	N/A	5	10
	Shareholding by black people in the construction contractor	25	N/A	25	25	40
	Shareholding by black people in the operations contractor	25	N/A	25	25	40
	Shareholding by black women in the construction contractor	N/A	N/A	5	5	10
	Shareholding by black women in the operations contractor	N/A	N/A	5	5	10

Management Control	Black people in top management	25	40	N/A	N/A	N/A
	Black board directors	N/A	N/A	25	25	50
	Black executive management	N/A	N/A	30	30	60
	Black senior management	N/A	N/A	30	30	60
	Black women board directors	N/A	N/A	8	8	25
	Black women in executive management	N/A	N/A	8	8	30
	Black women in senior management	N/A	N/A	8	8	30
Skills Development	Skills development contributions	0	0.5	0.05	0.05	0.30
	Bursaries for black students at higher education institutions	N/A	N/A	0.05	0.05	0.20
	Skills development contribution towards black disabled employees	N/A	N/A	0.05	0.005	0.025
Preferential Procurement	B-BBEE procurement spend	30	80	30	30	80
	Procurement spend on black enterprises	10	12	10	10	50
	B-BBEE procurement spend on qualifying small enterprises, and small and medium enterprises procurement	5	20	5	5	30
	B-BBEE procurement spend on black women-owned vendors	3	10	3	3	12
Supplier Development	Supplier development contributions during construction	0.1	0.2	0.1	0.1	0.2
	Supplier development contributions during operation	0	0.2	0.1	0.0	0.2
Enterprise Development	Enterprise development contributions	0.4	1.0	N/A	0.6	1.0
Socio-economic Development	Socio-economic development contributions	1	1.5	1.1	1.1	1.5

Appendix E: SED as Ranking Criteria in South Africa's Tender

Weighting of the elements of economic development criteria under REI4P and SP-I4P

Element	Description	REI4P Weighting	SP-I4P Weighting
Job Creation	South Africa-based employees who are citizens	25%	20%
	South Africa-based employees who are black people		
	Skilled employees who are black people		
	South Africa-based employees who are citizens and from local communities		
Local Content	Value of local content spending	25%	20%
Ownership	Shareholding by black people in the seller	15%	15%
	Shareholding by local communities in the seller		
	Shareholding by black people in the construction contractor		
	Shareholding by black people in the operations contractor		
Management Control	Black people in top management	5%	5%
Preferential Procurement	B-BBEE procurement, as percentage of total procurement spend	10%	10%
	Qualifying Small Enterprise and SME Procurement, as percentage of total procurement spend		
	Women-owned vendor procurement, as percentage of total procurement spend		
Enterprise Development	Enterprise development contributions, as a percentage of revenue	5%	5%
	Adjusted enterprise development contributions, as a percentage of revenue		
Socio-economic Development	Socio-economic development contributions, as a percentage of revenue	15%	15%
	Adjusted socio-economic development contributions		
SME Participation		-	10%

Model for Calculating B-BBEE Points in BW 5

B-BBEE Status Level of Contributor	Number of Points
1	10
2	9
3	6
4	5
5	4
6	3
7	2
8	1
Non-compliant contributor	0

Appendix F:
SED Commitments in South Africa's REI4P

Element	Description	BW 1	BW 2	BW 3	BW 4	BW5
Local Employment	South African employees	80.6%	81.8%	86.4%	96.2%	70.4%
	Black South African employees	54.8%	51.8%	63.1%	81%	47.5%
	Skilled black South African employees	43.4%	44.2%	48.4%	72.4%	31.1%
	Local community employees	20.4%	26.8%	34.1%	50.8%	25.7%
Local Content	Value of local content spending	34.4%	50.2%	47.5%	48.6%	44%
Shareholding	South African shareholding	51.2%	52.9%	52.4%	52.4%	49.2%
	Black South African shareholding	28.6%	26.1%	27.1%	40.2%	34.7%
	Community shareholding	10.3%	6%	12.5%	4.5%	2.5%
	Black shareholding: construction	13.8%	16.1%	40.2%	30.4%	25%
	Black shareholding: operation	13.6%	16.8%	19.9%	40.2%	28.5%
Management Control	Black people in top management	63.1%	53.7%	61.6%	88.6%	37%
B-BBEE Spend	B-BBEE procurement spend	50%	53.9%	84.8%	79%	56.4%
	B-BBEE procurement spend on black women-owned vendors	2.4%	2.9%	1.5%	3.9%	7.3%
Enterprise Development	Enterprise development contributions	0.4%	0.3%	0.8%	1.9%	0.6%
Socio-economic Development	Socio-economic development contributions	1.3%	0.8%	3.2%	5.3%	1.1%

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