



Best practices for successful auction program: connecting public sector and investors in emerging RE markets

This paper has been prepared by:



in collaboration with:



Paola Brunetto, *EGP* – Valeria Centorbi, *EGP* – Ginevra Biadico, *NRF* – Luigi Costa, *NRF* – Thomas Harris, *RINA*

Abstract

The successful implementation of renewable energy infrastructure depends on effective market designs that provide a suitable framework for reducing energy tariffs as well as creating a sustainable market that aligns with a country's broader goals. Auction programmes enable stimulation of the renewable energy industry through encouraging investment from the private market at the best price for the buyer. This paper analyses four countries (three cases in Africa and one internationally recognized as worldwide best practice) – South Africa, Zambia, Ethiopia and Mexico – all of whom have recently utilised auction programmes as a way of stimulating the growth of their renewable energy industry. The analysis aims at highlighting the effectiveness of these programmes whilst outlining the ways in which they are adapted to each country's specific needs, thus providing an analysis of the strengths an auction-style programme can bring to the renewables sector in terms of its flexibility, attractiveness, credibility competitiveness and socio-economic benefits.

Background

Renewable energy (RE) markets have undergone rapid developments in recent years. This change has been fuelled by the need to meet increasing energy demands whilst moving towards more sustainable energy sources to combat the effects of climate change and providing a wider range of energy access.

Previous models aimed at stimulating renewables growth have involved feed-in tariff (FIT) mechanisms that offer attractive tariffs for the integration of renewables into the energy mix. Although the government's support of RE through the FIT was initially necessary to fight the competition with conventional technologies and to accelerate the technological change in the field of energy production, the FIT schemes often yield slow growth results and have proved relatively unsuccessful in a number of countries.

Governments, unable to afford the costs of subsidizing the renewables markets, are relying on the private sector to deliver the investment required to drive renewables programmes. Reliable frameworks are essential to ensuring proper viability for private market participants to invest in the initiative. Many countries have experimented with ways to stimulate socio-economic growth through the renewables sector. This is particularly prominent in developing countries, as the benefits of investment in this industry can include increases in trade balance, industrial development and job creation. However, a problem exists in encouraging investments as there are large up-front costs required for renewables to be financially successful.

The use of auction programmes to procure RE infrastructure has become increasingly

commonplace because they provide a positive and reliable framework for reducing energy tariffs, meeting RE targets whilst increasing investments.

Case Studies

- **South Africa**

To promote renewables, South Africa explored the option of FIT (the REFIT programme) with a specific policy approved in 2009 but an operative procurement process was never implemented and no power purchase agreements (PPA) were signed. After consultations with possible investors, lawyers and financial institutions the government launched a refined alternative in the way of the Renewable Energy Independent Power Procurement Program (REIPPPP). The REIPPPP consists of a three-phase system with a capped capacity for each bidding round and for each technology which leaves no room for a competition between technologies. The first phase is technical and financial qualification (pass/fail), the second phase is an evaluation of price and economic development criteria which results in Preferred Bidders being invited to reach financial close before a pre-arranged common deadline in the second phase.

The program immediately attracted the attention of the global energy industry, particularly because of the transparent evaluation criteria, the bankable suite of request for proposal (RFP) documents and the program's size implying multiple bid winners and future prospects for the investors.

Formed in 2011, it has seen the electricity prices of wind power decreased by 46% and solar by 71% and US\$19 billion invested by

the private sector by 2016. South Africa's RE target for 2030 is 18,800MW (megawatts) and the initiative secured a quarter of this after just four years. The majority of the technology share lies with wind and solar generation with smaller amounts for concentrated solar, biomass, biogas, landfill gas, and hydro.

The structure of the REIPPPP is weighted 70% on pricing and 30% on job creation, local content, preferential procurement, rural development and communities involvement, education and the improvement of skills, enterprise and socio-economic development, etc., using the former to influence socio-economic growth, particularly in local communities and in more remote areas where these kinds of opportunities would usually be few and far between.¹ One of the main characteristics of this program is that the awarded projects must include local communities into their equity share. The observance of obligations related to the commitments on the above mentioned economic development criteria are monitored by the REIPPPP authorities through quarterly reports produced by the awarded bidders and in case of failure to meet the commitments under the PPA contracts are terminated.

Among the auction transaction documents, the Implementation Agreement, to be signed by the independent power producers (IPPs) and the Department of Energy (DOE), provides a sovereign guarantee of payment to the IPPs, by requiring DOE to make good on the payments in the event of an Eskom (the monopolist state utility and sole off-taker)

¹ Foreign firms have set-up local factories that export internationally, with some of the world's leading PV module producers now active in South Africa.

default. South Africa's rather strong international credit standing makes banks and investors quite comfortable about the sovereign country risk without requiring specific insurance products. The developers are expected to identify the sites and pay for early development costs at their own risk. A registration fee is due at the outset of the program and bid bonds has to be lodged.

A report from the Department of Energy about the success of the REIPPPP (up to June 2015) claims the following figures:

- 4,294 Gigawatthours of power generated;
- R4 billion more in financial benefit than its cost;
- 1.2 million homes powered by electricity generated from renewables projects; and
- 19,050 employment opportunities for South African citizens during the construction and operation phases of the 37 projects under the umbrella of the programme.

In addition, the bid window function of the REIPPPP has seen committed investments R192.6 billion from developments in the first four rounds of bidding, of which R53.2 billion was from foreign investors and financiers. As a result of the targets for local content some international production facilities set up local production units and specialized skills were transferred from international to national firms.

The REIPPPP is also proving to be a significant help to the Broad Based Black Economic Empowerment (BB-BEE) policy, something which is a strong contributor to the argument of socio-economic benefits in South Africa. 47% of the equity shareholding in the first four bid rounds belongs to South

Africans – 7% above the stated target of 40%.²

The nature of the REIPPPP is allowing the country to move forward to clean energy technologies that are also bringing a new wave of economic opportunities, not only boosting employment with regards to construction, but also the continuing maintenance required over the life of RE plants.

Worries over the future of the REIPPPP supposedly lie with the financial stability of Eskom. This is a current and ongoing issue and the impasse created is affecting the presence in the country of the already established international investors. The programme ran smoothly for the first 3 rounds but the fourth and fourth point five rounds have seen several delays spanning nearly two years. These delays have particularly impacted the local manufacturing and training industries which responded to the local procurement requirements by establishing state-of the-art facilities to supply, amongst other things, solar modules, inverters and wind turbine towers. Almost all of these ventures have now ceased to operate and a number of international investors and construction companies have reduced their presence in the country or have left it.

Recent support from the government has expedited the backlog but projects are not expected to reach financial close imminently.

- **Zambia**

Many African countries looked at the South African case trying to replicate the initial successful experience and certainly Zambia,

with less than a quarter of the population having access to electricity, was one of them.

In 2015, the Industrial Development Corporation (IDC), an investment company wholly owned by the Zambian government, was directed by the government to target the procurement of solar energy power in view of the energy crisis Zambia was experiencing. It was in this context that the Southern African country signed up to join Scaling Solar, a World Bank Group program designed to make it easier for African Governments to quickly procure solar power and to minimize all financial transaction risks through competitive tendering and pre-set financing and insurance products. IFC, the World Bank development institution, handled the legal and regulatory analysis, the technical and economic studies for the selection of the optimal size and location of the two solar plants.

The winner selection criteria were based exclusively on the minimum price offered for each project and the same bidder didn't have the possibility to be awarded the 2 projects.

The execution of the first round of the program in Zambia proved the effectiveness of Scaling Solar in reducing the lenders and bidders perceived risks thanks to the transparent award process and the fully bankable transaction documents included in the RFP package. More specifically the investors' confidence was fostered by the PPA provisions on the off-taker payment obligations and the credit support mechanism based on the purchaser requirement to maintain a liquidity of an amount equal to 6 months' revenues. In addition to the above mentioned provisions, the introduction of the Government Support Agreement bringing in a primary obligation for the Zambian Government to provide PPA

credit support, if not in place, furtherly encouraged the bidders' participation to the program.

The first round of the tender, with the aim to secure the development of two solar projects of up to 50 MW each, initially attracted 48 developers, of which 11 top tier bidders were prequalified for the subsequent bidding process. Seven bidders submitted final proposals and the winning tariffs were 60.15 USD/MWh and 78.89 USD/MWh making Zambia the Sub-Saharan Africa's country with the cheapest solar power at that time.

Although the official awarding took place in May 2016, the process to achieve the financial closing of one of the two projects was finalized in December 2017, whereas the second one is still on-going, leading to an inevitable postponement of the scheduled commercial operation date.

Second Round of the Zambian Scaling Solar auction for up to 300 MW is currently on-going.

- **Ethiopia**

Ethiopia is undertaking an important expansion of its power sector targeting to increase the today installed capacity of 4 GW up to 17GW by 2020. The country has abundant hydropower resources, and this technology accounts for more than 70% of generation. Nevertheless the government seeks to differentiate the production technology considering, in addition to further hydroelectric power plants, other renewable sources to cover the energy plan requirements.

So far much of the development is driven by the government through the company Ethiopian Electric Power (EEP), the state-owned power producer, which is now trying

to create an environment suitable for the participation of IPPs.

The first renewables auction in the country was launched by EEP, advised by Nexant, in 2016 with the scope of assigning a 100 MW solar project located in a site selected by the government.

The launch of the RFP initially attracted tens of investors but only five international energy firms presented their offer.

The final score was weighted 70% on proposed tariff, 20% on bidder's and manufacturers' track record, 5% on local ownership and 5% on local content. The entire auction duration was approximately 1 year with many postponements to the original submission date. This was mostly due to the time needed to address the bidders concerns related to financing difficulties to raise private investment with the initial RFP conditions. Among the main concerns raised by the bidders it is worth mentioning the absence of the sovereign guarantees on off-taker payments and the access to foreign currency which could be very constrained as in Ethiopia the foreign reserves are low and access go to priority sectors.

The selection of the bidder was finally announced last October (winning tariff of 58.98 USD/MWh and the lowest 56.98 USD/MWh) and the power plant is expected to enter into operation in 2019. In addition to the first auction, the Ethiopian government launched a second auction to assign the PPA of two solar projects of 100MW each and joined the Scaling Solar program for the development of 2 solar projects of 125MW each. The RFP is expected to be issued in January 2018.

- **Mexico**

The Mexican Energy reform approved in 2013 and the secondary legislations adopted in August 2014 provided for a transformation of Mexico’s energy sector.

On the basis of the legislative changes it was created a wholesale power market requiring the acquisition of clean energy certificates by suppliers and users, in proportion to their annual energy consumption, and a system of medium and long-term auctions, to be held at least once a year.

As in the South African case, the clear schedule and periodicity of auctions, in the context of a well-defined target for renewables (35% clean energy by 2024), gave investors clear indications of the roadmap for the sector encouraging investments.

Through the Long Term Auctions, market participants offer to sell or buy a combination of three products: energy, capacity and Clean Energy Certificates (CEs). Successful participants secure fully bankable PPA for the sale of one or more of these products at a fixed price for either 15 years for energy and capacity or 20 years for CEs. Winner selection criteria are highly sophisticated, the winners are selected based on an optimisation model that maximises the economic surplus of the buyer.

The process is designed for the possibility of iteration, based on pre-defined criteria regarding the economic return of the offers, but for the first 3 auctions it was not applied.

Mexican auctions are not site-specific, and bidders are responsible for identifying suitable project sites and producing the relevant documentation (resource assessment, grid connection, etc.) and are

being conducted three years in advance of the time for delivering energy, so as to provide sufficient time for the development of projects.

Another important characteristic of the Mexican auction is the introduction of the nodal price adjustments designed to incentivise the construction of new projects in regions where the supply-demand balance is tight. The price adjustments are determined a few months before the prequalification phase and in the first and third auctions decisively affected the selection of winners.

The first auction was run in 2016, 227 offers from 69 bidders were submitted by local and international companies and 5.4 TWh/year of energy were assigned. In the second auction 8.9 TWh/year were awarded and the minimum price was one of the lowest clean energy prices anywhere in the world and 30% lower than the average price from the first auction. The third auction saw the awarding of 5.5 TWh/year of energy and further remarkable reduction of the prices.

	First Auction	Second Auction	Third Auction
Minimum Price	Wind 38.8	Wind 32.0	Wind 17.8
Energy + CEs (USD/MWh)	Solar 32.1	Solar 25.7	Solar 18.9
Average Price	Wind 52.7	Wind 35.3	Wind 18.5
Energy + CEs (USD/MWh)	Solar 45.1	Solar 31.6	Solar 20.8

In the first and second auctions the only permitted buyer was the Federal Electricity Commission (CFE), the regulated government entity responsible for providing energy to basic users. In the third auction other Load Serving Entities could present purchase offers thanks to the introduction of the Cámara de Compensación, or the Clearing House, an entity acting as the counterparty in the Power Purchase Agreement for both sellers and buyers which assesses the financial credibility and administers the Individual Guarantees and the Reserve Funds (the Safety Network) reducing the parties' risk exposure.

The 15-year duration of the energy and capacity contracts, which is shorter than the useful life of the plants represents a risk to investors and makes the tender strongly affected by each participant's view on the Energy, CELs and Firm Capacity forward curves as any products surplus can be traded in the Spot Market.

The Mexican auction represents one of the best examples of effective and successful renewables auctioning program.

Major best practices

To date, around 55 countries have implemented auction programs, some of these countries, however, lack the regulatory framework to support the proper functioning. Among the major best practices for a successful program it is worth mentioning:

- An auction program must be well-structured, planned and transparent, ideally linked to an energy master plan that is underpinned in the energy ministry's policy;
- Auctions must be conducted on a regular basis;

- A stable and comprehensive legal and regulatory framework is required to support the auction program;
- The set of contracts/agreements need to ensure the bankability of the entire transaction;
- Requirements for the eligibility of the participants are essential to guarantee the timely execution and to reduce the risk of disrupt competition;
- Rules and regulations of the auction program must be clear, credible and enforceable in order to avoid delays and minimize the risk of overly aggressive bidding strategies;
- Attention may be required not only in reference to low prices achieved but also to other factors, such as, for example, the additional remuneration during periods of peak demand or for sale of energy in high marginal prices nodes.

Auctions for RE development should be implemented in combination with other measures such as, transmission grid expansion and continuously adaptation of the support policies (fiscal incentives, etc.,) in order to preserve a stable and attractive environment for investments and, at the same time, ensure the long-term reliability of the energy system in a cost-effective manner.

Detailed analysis of best practices for a successful auction program

1. Account for trade-offs between different design elements

When designing an auction program it is necessary to select and combine different design elements in a way that is tailored to satisfy the purposes of the auction, according

to the country's specific requirements and characteristics.

One of the first elements of an auction is the choice of the auction demand: only in case the country goal is the development of a specific technology, a technology-specific tender should be selected. A technology-neutral auction shall always be favored if the aim is to minimize the electricity costs and maximize the competitiveness.

It is essential to determine the volume of products to be auctioned according to government policies for RE development and in compliance with the existing system's technical capabilities to absorb the renewable energy. This can be done through a fixed volume method (the most common worldwide) or in a price-sensitive demand curve mechanism where the auction's equilibrium prices affect the demanded quantities. In both cases, in order for the policy makers to increase investors' confidence for a cost-effective outcome, the total volume auctioned shall be divided into different rounds in a systematic auctioning scheme, with a cap on the volume auctioned in each round, which helps long-term planning. Systematic auction schemes attract a larger number of bidders and are beneficial to the country's RE industry and to the grid planning. Standalone auctions may be appropriate when the total quantity to be auctioned is small. They allow the government to adjust the auctioning schedule on the basis of the shifts in market conditions but do not favor the long term investments of international players and the growth of a proper local renewable market.

With reference to the nature of commitment held by the project developer, there are usually three alternatives:

- capacity-oriented agreements, where the project developer needs to ensure only RE capacity;
- energy-oriented agreements, which imply a commitment to deliver a given amount of RE; and
- financial agreements, entailing greater risks for the developer because the generator may be exposed to fluctuations in the electricity spot market prices.

The choice among the abovementioned alternatives depends on the desired risk allocation between generators and consumers.

Furthermore, the bidding procedure may be satisfied by three different approaches:

- Sealed-bid approach, where all bid information is provided to the auctioneer beforehand;
- Iterative approach, where the economical bid is provided gradually during the auction;
- Hybrid approach, where an iterative phase is followed by a sealed bid phase.

In the case of sealed-bid mechanism, in order to ensure absolute transparency, the opening of the bid shall be executed at the bidders' presence.

2. Trade-off between reducing entry barriers and encouraging competition

Although the requirements for a careful selection of the bidders, through an extensive legal, financial and technical track record in the field, can limit the participation of new and/or small players, it is important to guarantee the timely achievement of the financial closing and the projects' completion.

Similarly, the requirement of a bid bond (i.e. an initial deposit to be lost in case the selected bidder withdraws the offer) with a price high enough as to discourage rash bids, may ensure reliability of bidders and of their submitted offers as proven in the *Zambian Scaling Solar* case.

In addition to bid bonds, rules related to project lead times, penalties for delays and the adoption of performance bonds (covering the entire construction period) are applied in order to discourage any construction delay in the achievement of the commercial operation date and to assure that the committed performances are met.

On the other hand, the assignment of liabilities to the transmission system operators (TSO) for delays in the construction of the grid or connection infrastructures owned by the TSO, contributes to the reduction of the investment risk.

3. Awarding selection criteria

With reference to the awarding selection process, if the auctioneers aim to reach the lowest price, they shall opt for the lowest-price criterion. If instead it is in the country interests to focus on other selection criteria such as local content, local ownership, job creation, communities involvement, etc. (*South African* case) or such as bidders and manufacturers' track-record or local ownership (*Ethiopian* case), the auctioneers shall very carefully select the awarding criteria as every non-monetary principle may lead to an increase in the final energy price to be paid by the off-taker and in a more complex selection process.

The auctioneers may also set a ceiling price above which bids are discarded but, in case this is not properly estimated, it could cause the awarding of a suboptimal amount of renewable energy.

4. PPA remuneration

Remuneration scheme and the type of contract offered have a very high impact on the final energy tariff. The take-or-pay provision (whereby the off-taker has the obligation of either taking delivery of energy or paying a penalty) reduces the bidders and funders risk and shall be favored in order to ensure that no margin is included in the final offers and the energy price is the cheapest possible.

Another important factor is the tariff adjustment (to inflation, to exchange rate or a combination). Some programs, such as the *Zambian Scaling Solar*, do not foresee any indexation to the energy tariff, which remains flat for the entire duration of the PPA, but consider exchange rate adjustment of the tariff. In other cases full or partial indexation to CPI is considered (*South African REIPPPP* where instead no adjustment to currency is foreseen). In the case of the *Mexican* auction, on the contrary, the bidder can choose the option providing for a tariff partially adjusted for inflation and partially tied to the exchange rate for the US dollar. In those cases in which the offered tariffs are not corrected for inflation or foreign exchange rates, taking into account the possibility of high inflation rates over the PPA duration, the contract's value in real terms may be expected to substantially decrease and the bidder may decide to protect its investment return by increasing the tariff.

Contracts denominated in domestic currency and without exchange rate adjustments are also generally seen as an obstacle for international players and can increase the cost of debt, especially in emerging countries facing devaluation. The off-taker guarantee of conversion to hard currency can reduce the risk perception as long as there's no risk of liquidity shortage.

5. Reduction of risks perception

The reduction of perception of risks may be achieved guarantying fair and transparent rules and obligations for all stakeholders. As mentioned in the previous paragraph, policy makers should simplify administrative procedures, set up an institutional and regulatory framework which ensures a predictable and stable environment for investments and mitigate the risks related to the financial market (inflation and currency exchange). Moreover, the reliability and creditworthiness of the off-taker, together with clear and balanced obligations and guarantees of both seller and purchaser in a PPA, play an important role in encouraging developers and lenders investments. Whilst in most mature electricity markets the government involvement can be minimized and the utilities are the contract off-takers without additional subsidies, in the countries where the off-taker cannot reasonably offer credible guarantees, the government support could be essential (see Zambian and Ethiopian case). A noteworthy example in term of risk perception reduction can be also the Scaling Solar program. The support of an international institution, such as the World Bank Group, to the auction program can foster the confidence of bidders and lenders as it happened in the Zambian case.

Finally, wherever possible, in order to promote investments from international players, governments and auction designers should limit restrictions on movements of capital and on repatriation of dividends and profits.

6. Technical aspects of the auctioned projects

In the auctions where the bidders are expected to identify the sites and autonomously develop the projects it is

essential for the auctioneers to assess the maturity of the permitting status, grid connection, land rights, etc. More specifically, written assurance from the transmission and/or distribution grid provider that the substations/lines to which the projects are intended to be connected have sufficient capacity, may result in a higher project realization rate while avoiding unnecessary delays in the execution of the projects.

When, instead, the projects size and location are demanded to the auction authorities, it is very important to include in the bid package detailed studies of the selected project sites which will allow the participants to accurately evaluate the construction costs and related technical risks without adding any contingency costs impacting the final proposed tariff.

Advantages of a successful auction program

- **Credibility and financial attractiveness**

The scale of auction programmes attracts international investors and lenders and requires sovereign commitment. Therefore, the programme itself is seen as the investment framework rather than as individual projects and thereby market risk (or at least the risk perception) is reduced because all parties involved share risks and work collectively to mitigate these. Depending on the intended duration of the programme, international parties tend to establish local offices which may lead to further commitment to the credibility of the country.

- **Flexibility**

The flexible aspect of the design of auction programmes and their ability to be applied to

a variety of different purposes is a strong advantage. This can be useful when adapting such programmes to the specific needs and targets of the country implementing the programme. For example, an auction programme can be used for procuring capacity or energy that is tailored specifically to the market structure of a country. Contracts can also be assigned and performed in a number of ways and can include a number of criteria at both the qualification and evaluation phase.

- **Competition**

Auction programmes can increase competition in the industry allowing the best, or lowest, price to be provided for a given product or service. Fair and open competition enables autonomous development, which accurately reflects potential and can lead to the creation of new industry sectors, stimulate the modernisation of infrastructure and create new employment opportunities. This of course requires regulations that are adequate and effective; however it is a good demonstration of the benefits of auction programmes.

The benefit of this is magnified by the nature of the renewables market, which is generally a rapidly changing context that is hard to predict. This makes aspects such as costs, market size and public awareness difficult to control through any fixed FIT schemes.

- **Social and Economic benefits**

One of the clearest advantages and strongest argument for auction programmes in the RE industry is the socio-economic aspects. Although this sits in the “second phase” part of the programme, it still forms part of the overall advantage of implementing such systems as the former brings the latter.

Education and skills, welfare, management and planning, healthcare, and infrastructure development and employment are examples of the commitments these auction programmes can bring.

The job creation aspect has enormous potential, with not only construction but also maintenance of renewables infrastructure. The potential is highlighted by its benefits to local communities where new infrastructure might be developed in places where these kinds of opportunities would usually be very limited.

References

Anton Eberhard, University of Cape Town, Joel Kolker, World Bank Institute, James Leigland, Private Infrastructure Development Group, South Africa’s Renewable Energy IPP Procurement Program: Success Factors and Lessons

IFC, First ‘Scaling Solar’ Auctions in Zambia Yield Record Low Tariffs amid Electricity Shortages

Bloomberg New Energy Finance, Climatescope 2017

IFC Financing Advances Record-Setting Scaling Solar Project in Zambia

IEA, Mexico capacity and power auctions supported by clean energy certificates

Carlos Del Razo, A snapshot of the Mexican clean energy obligations system

José Maria Valenzuela and Isabel Studer, Climate change policy and power sector reform in Mexico under the ‘golden age of gas’

IRENA, Renewable Energy Auctions Analysing 2016 IRENA2016

IRENA and CEM (2015), Renewable Energy Auctions – A Guide to Design

Prof. Anton Eberhard and Thomas Kåberger, 'Renewable energy auctions in South Africa outshine feed-in-tariffs' (2016) Energy Science & Engineering Journal 4(3) at 181-232.

Energy Intelligence (24 March 2016) 'REIPPPP: All you need to know!', available at <<http://www.energyintelligence.co.za/reipp-p-all-you-need-to-know/>> [accessed 10 December 2017].

Department of Energy (2015) Renewable Energy IPP Procurement Programme (REIPPPP) for South Africa at 11, available at <sastela.org/wp-content/uploads/2015/10/DoE-REIPPPP-for-South-Africa.pdf> [accessed 10 December 2017].

Lucy Butler and Karsten Neuhoff, 'Comparison of feed-in-tariff, quota and auction mechanisms to support wind power development' (2008) Renewable Energy 33(8) at 1854-1867.