Feed-in tariffs or auctions? Procuring renewable energy supply in South Africa

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Feed-in tariffs have been the most widely used support mechanism to encourage the growth of grid-connected renewable energy. But could competitive tenders or auctions offer lower prices while still providing adequate incentives for market entry by renewable energy suppliers? This article looks at recent developments in South Africa, which initially explored feed-in tariffs for renewable energy but then turned instead to competitive tenders.

Initial outcomes are encouraging. There has been much market interest, and subsequent bidding rounds have seen prices fall. Could there be lessons for other countries? South Africa relies more on coal for electricity production than any other country. In the face of climate change concerns it has embarked on a transition to lower-carbon-emitting technologies. The most recent electricity plan included ambitious targets for renewable technologies. The most recent electricity plan included ambitious targets for renewable energy: 18 800 MW of wind and solar out of a total projected system capacity of around 90 000 MW, by 2030. South Africa first explored the option of renewable energy feed-in tariffs (REFITs) before choosing instead to pursue competitive tenders.

**The birth and death of the REFIT program**

The national energy regulator of South Africa (NERSA) approved a REFIT policy in 2009 which incorporated tariffs designed to cover generation costs plus a real return on equity of 17%, fully indexed for inflation. Initial published tariffs of 15,6 c/kWh for wind, 26 c/kWh for concentrated solar, and 49 c/kWh for photovoltaics, were generally regarded as generous [1]. Considerable uncertainty remained around the legality of feed-in tariffs within the public procurement framework, and delays in finalising power purchase agreements and interconnection agreements with the national utility, Eskom.

In March 2011 NERSA released a consultation paper with lower feed-in tariffs, arguing that a number of parameters had changed including exchange rates and the cost of debt. The new tariffs were 25% lower for wind, 13% lower for concentrated solar, and 41% lower for photovoltaics (in nominal rand terms). Moreover, the capital component of the tariffs would no longer be fully indexed for inflation. NERSA did not change the required real return for equity investors of 17%. More policy and regulatory uncertainty was to come. After receiving legal advice that feed-in tariffs were inconsistent with public finance and procurement laws, the department of energy announced that a competitive bidding process would be launched, known as the renewable energy independent power producer procurement (REIPPPP) program. Subsequently, the regulator abandoned feed-in tariffs. Not a single MW of power had been signed in the two years since the launch of the REFIT program.

**The birth and early life of the REIPPPP program**

A request for qualification and proposals was issued in August 2011. A bidders’ conference held in September of that year attracted more than a thousand participants, many from abroad. A total of 3625 MW of new power capacity was offered, with overall procurement caps for specified technologies, mainly wind and photovoltaics, but also smaller amounts available for concentrated solar, biomass, biogas, landfill gas, and small hydro (see Table 1).

Projects had to be larger than 1 MW, and an upper limit was set for different technologies—for example, 50 MW for concentrated solar and 140 MW for a wind project. Another 100 MW was reserved for small projects below 5 MW. Price caps were specified for each of these technologies at levels not dissimilar to NERSA’s 2009 REFITs, all of them much higher than Eskom’s average generation tariff of around 5 c/kWh at the time. Standard 20-year, local-currency denominated power purchase agreements were offered, with the off-taker being Eskom. Up to five discrete bidding rounds were envisaged, at more or less six-month intervals, with the first round of bids due in November 2011.

**Qualification criteria**

The bid evaluation involved a two-step process. In the first, bidders had to satisfy certain minimum threshold requirements in six areas: environment, land, commercial and legal, economic development, financial, and technical. The economic development requirements in particular were complex, incorporating 17 sets of minimum thresholds and targets. The minimum threshold for local content was set at 25%, with a target of 45% being encouraged. Bid bonds or guarantees had to be posted, equivalent to $12 500 per MW of nameplate capacity, and the amount was doubled once preferred bidder status had been announced.

Bidders that satisfied the threshold requirements then proceeded to the second
step of evaluation, where bid prices counted 70% with the remaining 30% weighting given to composite scores on job creation, local content, preferential procurement, enterprise development, and socioeconomic development.

Round one outcomes

A total of 53 bids were received, amounting to 2128 MW. A large legal, technical, financial, and governance evaluation team was assembled in a high-security environment with 24-hour voice and CCTV monitoring. The evaluation resulted in 28 qualifying bids, amounting to 1416 MW of new capacity. A deadline of July 2012 was set for financial close, and a deadline of the end of 2014 for the commercial operating date.

The prices bid were mostly uncompetitive and only marginally below the caps specified in the request for proposals. Implementation, direct, and power purchase agreements were signed in November 2012 between the government, Eskom, and each of the 28 successful bidders, resulting in a total investment of close to $6-billion. Much of the debt component was provided by local South African commercial banks.

Round two outcomes

The second bidding round, which incorporated lessons from the first, with less capacity (1275 MW) being offered in order to stimulate more competition, closed in March 2012. This round brought 79 bids, totalling 3255 MW. 51 met the qualifying criteria, and 19 of them were granted preferred bidder status. Wind and photovoltaics prices in the second round were much more competitive, falling on average by 20% for wind and 40% for photovoltaics (Table 2). The range of prices bid was also wider, with prices varying from 10 to 12 c/kWh for wind and from 17.5 to 22 c/kWh for photovoltaics. The price for concentrated solar fell by 7%, and there was little competition in small hydro, with only two qualifying bids, both at the capped price. The bids also featured higher local content offerings.

The remaining 1166 MW were made available in the third bidding round, which closed in August 2013.

What are the lessons?

The South African REIPPP program is not only the largest renewable energy program in Africa, it is also the largest IPP program of any African country and probably the most complex public-private procurement ever run on the continent. According to Bloomberg new energy finance, South Africa ranked among the top 10 countries on clean energy investment in 2012, ahead of Canada, Brazil, Spain, and France. This is all the more remarkable given South Africa’s previously dismal record in IPPs and the dominance of its national utility, Eskom, on the government’s instruction, had attempted to run a number of IPP procurements before, all of which failed. Ultimately, the department of energy and the national treasury had to wrest control of the REIPPP program from Eskom.

First round projects are approaching commercial operation, and the REIPPP program can be considered a success in terms of attracting a multitude of private project developers and investors. In the second round the program fostered competition with consequent impressive falls in prices, which would not have happened in a REFIT program. Results were achieved in record time: bidding in the first round closed three months after the request for proposals was issued, preferred bidders were announced within a month, and contract signing and financial close were achieved 10 months later, even though as many as 28 projects, employing different technologies of different sizes at different sites, had to be processed in parallel.

Factors in the REIPPP program’s success

Several elements have contributed to the success of the REIPPP program:

- The procurement process was well designed. Recognizing that there was little institutional capacity to run a sophisticated, multiproject, multibillion-dollar international competitive bidding process for renewable energy, South Africa’s department of energy sought the assistance of the national treasury’s public-private partnership unit, which in turn relied extensively on local and international transaction advisers.
- High standards were set for the bidding process, and the government stuck largely to the announced schedule and core bid requirements. Despite a tight time schedule and tough qualification criteria, the REIPPP program attracted 53 bids in round one and 79 in round two. A large number of these met the minimum qualification thresholds: 28 in round one and 51 in round two. However, the announcement of the REFIT program two years before the launch of the REIPPP program contributed to early market interest, as a number of bidders had already identified sites and begun resource measurements. Before issuing the RFP, the DoE had also issued an earlier request for information from prospective project developers, which confirmed significant market readiness.
- Flexibility in the design of subsequent bidding rounds meant that lessons could be incorporated to improve the competitiveness of bids and prices. For example, it became apparent that the capacity made available in round one exceeded the capacity of the market to deliver, and the capacity tendered in round two was reduced to induce more competition.
- The renewable energy sector is potentially highly competitive, given the diversity of energy sources, the modular nature of most of the technologies, and the number of project developers.
- Subsequent bidding rounds have incorporated more stringent threshold as well as target criteria for local content objectives, which will result in employment creation.
- The local capital market has responded positively to the opportunity presented by the REIPPP program, which will involve total investment approaching $15-billion. Commercial banks have been willing to finance construction, and some are on-selling debt to insurance companies.
- Real returns to equity in round one were close to the 17% that was envisaged in determining the original feed-in tariffs. Equity returns dipped slightly in round two for wind and probably more substantially for photovoltaics. Dollar returns in the range of 12 – 13% have been reported.
- Project bidders are required to incorporate a tax of 1% of project revenues that will go into a government renewable energy fund to support subsequent procurement programs.

Potential areas for improvement

While much has gone well in the REIPPP, hindsight suggests that some areas could have been better designed and managed:

- The size and readiness of the local renewable energy market were initially overestimated, resulting in less capacity being bid than was made available. There was thus limited competition in round one, and bid prices were close to the price cap. Use of the single-price offer (rather than a dynamic reverse auction as employed, for example, in Brazil) also restricted competition.
- The size and complexity of the REIPPP program stretched available legal and financial advisory services to the limit. Some firms were permitted to offer advisory services to both the government and private bidders and funders as long as they created adequate “Chinese walls”
within the firm. Some bidders complained that legal and financial firms were offering a “one size fits all” service, which was not always appropriate for specific projects.

- The above two points suggest that it might have been more prudent to start smaller and then gradually ramp up the program, with larger blocks of capacity being offered in subsequent rounds.

- The aim of the REIPPP program is lower prices, but projects must still be bankable. A successful bidding process should have a low attrition rate among preferred bidders. Bid prices need to be realistic.

- Specifications on what constitutes local content could be improved, including more focus on those parts of the value chain that maximize local employment.

- A balance needs to be struck between the promotion of economic development and prices. Economic development threshold and target criteria are more stringent than in most other countries (and, indeed, more stringent than in previous public-private partnerships in South Africa). The South African renewable energy market is small by international standards, and investment in local manufacturing capability is not necessarily competitive. International benchmarks indicate that South African renewable energy prices are high.

- In some areas there is inadequate transmission grid capacity and otherwise viable and attractive projects have to compete for access. There have also been complaints about the lack of responsiveness of Eskom transmission planners. Integration of planning, procurement, and contracting functions in the proposed independent transmission system, and market operator would make it easier to resolve these constraints.

- The transaction costs for the REIPPP program were high for both the government and the bidders (certainly higher than for a REFIT program). The government has had to rely on external transaction advisers, but there is potential to transfer skills and experience in future procurement rounds and to build capacity in the proposed independent system and market operator.

- The levelised energy costs that were calculated for the initial feed-in tariffs served as the departure point for the REIPPP program. Some other countries, such as Tanzania, have used avoided costs as their starting point.

- South Africa’s power market continues to be shaped by centrally managed power planning and procurement processes. However, there are growing political and stakeholder concerns around rising electricity prices, and demand growth is lower than predicted. The sustainability of the REIPPP program depends on volumes and predictable procurement processes, but will depend also on how quickly renewable energy prices fall and how competitive they become with prices for other energy sources.

### Conclusion

South Africa’s REIPPP program provides a valuable opportunity in learning how to procure renewable energy projects effectively in developing countries. What are the lessons for other developing and emerging market economies?

The South African experience suggests that competitive tenders are a viable alternative to feed-in tariff programs for renewable energy and potentially offer better price outcomes with fewer risks of excessive rents being appropriated by renewable energy suppliers. In developed countries the core rationale for introducing REFITs was to create market certainty and simplify procurement processes in order to stimulate production and innovation in renewable energy technologies and markets, thus bringing prices down over time. But in many developing countries, especially in Africa, the market for renewable energy technologies is much smaller and this rationale does not apply. Indeed, for many smaller developing countries with low carbon footprints, the argument for greater use of more expensive renewable energy technologies needs to be balanced against mother development priorities.

While competitive tenders for renewable energy are potentially an attractive alternative to REFITs, transaction costs are high and many small developing countries may lack the capacity or resources to run such complex and expensive procurement processes. REFIT programs are generally simpler, although the requirements for good design and evaluation should not be underestimated. Development assistance programs, including those from development finance institutions, should carefully consider the costs and benefits of competitive tenders relative to those of feed-in tariff regimes. Funding the higher initial transaction costs will ultimately be more cost-effective if lower power prices are likely. These lessons also apply in the main to auctions for renewable energy. Competitive tenders generally incorporate a weighting of price and non-price factors while auctions are awarded solely on the basis of lowest among qualified bidders. Running effective auctions might require even greater time, expenditure, transaction costs, expertise, and capabilities than running tenders. Auctions might also encourage underbidding, with the risk of subsequent contract failures. But the experience with dynamic reverse auctions for example, for wind energy in Brazil – has been positive. competition has driven prices down dramatically. It would be interesting to explore the possibility of a hybrid design in which winning prices from a dynamic reverse auction are subsequently weighted with non-price factors.

### References


### Acknowledgement

This article was originally published in the Worldbank Viewpoint note 338, April 2013 and is reprinted with permission.

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