Commissioning renewable energy: a review of South Africa's regulatory and procurement experience

Gaylor Montmasson-Clair[1] and Georgina Ryan[2]

1. Introduction

As the world grapples with multiple crises on economic, social and environmental fronts, sustainable development, notably through the transition to a green economy, has been internationally acknowledged as the way forward. South Africa is in a unique position to benefit from the shift to a greener development path, particularly owing to the country's abundance in renewable resources (predominantly solar and wind). Accordingly, the country has demonstrated an increasing commitment to sustainable development in the last few years, notably in the field of renewable energy.

South Africa's Renewable Energy Independent Power Producer (REIPP) procurement programme was launched in August 2011. In less than two and a half years, 64 projects have been approved, of which 47 have already achieved financial close. They represent a combined investment of around ZAR 150 billion for 3 916 MW of generation capacity (Department of Energy, 2013a). The REIPP procurement programme, which builds on the experience of previous domestic endeavours, has been hailed worldwide as a model for renewable energy procurement. Its success is indeed far from experimental and haphazard and points directly to a set of learnings and lessons acquired prior to, and during, the launch and running of the programme. Early initiatives aimed at independent power producers (IPPs) designed and implemented by Eskom, the state-owned vertically integrated utility, and the Renewable Energy Feed-In Tariff (REFIT) policy spearheaded by the National Energy Regulator of South Africa (NERSA) prepared the ground for the existing programme and directly contributed to its achievements.

This paper[3] explores the journey to the REIPP procurement programme and draws a series of critical learnings on which the success of the scheme is built. Section 2 first exposes the four main dynamics which have driven the development of renewable energy in South Africa. Section 3 then discusses the success of the REIPP procurement programme in developing the renewable energy sector in the country. Section 4 reflects on South Africa's experience in the introduction of renewable energy and IPPs, and draws seven key lessons explaining the success of the current programme, centred on the creation of a policy space for the renewable energy sector, the implementation of the appropriate institutional and regulatory framework, the readiness of the market and the stimulation of competition. Putting these knowledge accumulation processes into perspective, remaining challenges and areas of improvements

[1] Trade and Industrial Policy Strategies (TIPS), gaylor@tips.org.za
[2] Trade and Industrial Policy Strategies (TIPS), georgina@tips.org.za
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are also investigated. Section 5 concludes with a discussion on the way forward for renewable energy in the country.

2. Four main dynamics drive the development of renewable energy in South Africa

The development of renewable energy in South Africa, which is strongly intertwined with the introduction of IPPs onto the electricity market, directly results from four grand dynamics.

First, the South African government recognises that Eskom alone does not have the financial and technical capacity to meet the country's electricity demand and ensure energy security. A hybrid model progressively introducing IPPs but maintaining the dominance of the state-owned enterprise has been implemented in the country, with the objective of deriving 30% of the new power generation capacity from private developers (from renewable energy but also coal, gas and hydropower) (Steyn, 2013). Accordingly, identifying and removing the barriers to the participation of the private sector in renewable energy was the initial mandate of the Department of Energy and the National Treasury, through its public-private partnership unit, which eventually resulted in the establishment of the REIPP procurement programme.

Second, the development of renewable energy, along with the introduction of IPPs, aims to ultimately reduce the cost of electricity in South Africa. In the short term, the national utility could benefit from IPPs building new plants and generation capacity at their own cost and financial risk, and arguably faster and more competitively for a given technology (Yelland, 2009). In the medium to long term, the development of renewable energy-based electricity will contribute to reducing the cost of electricity. Renewable energy technologies are becoming increasingly competitive and cost effective alternatives to traditional fuels and technologies (Department of Energy, 2013a, 2011; IRENA, 2013a). The planned introduction of an economy-wide carbon tax in South Africa will further build the business case for a substantial share of renewable energy in the country's electricity supply mix.

Third, the development of renewable energy is a clear priority of the South African government's climate change mitigation and green economy strategies. The rollout of renewable energy in the country, from large-scale grid-connected projects to small-scale rooftop systems, contributes to the country's transition to a greener economy by changing the structure of the energy sector. Renewable energy-based electricity not only reduces the country's greenhouse gas emissions, but improves water availability and air quality (TIPS and GGGI, *forthcoming*). In addition, off-grid solar home systems have been identified by the South African Government as the preferred electrification technology in rural areas (Department of Energy, 2012a).

Last but not least, the creation of a renewable energy industry in the country is meant to support local economic development objectives. Particularly, the creation of sustainable employment, along with the development of a domestic manufacturing capacity, constitutes government's priority. The South African government aims to create 400 000 new direct jobs by 2030 in green economy sectors, as targeted in the country's New Growth Path (Economic Development Department, 2010). Community ownership and black economic empowerment

also feature high on the governmental agenda and constitute key characteristics of the existing renewable energy programme.

3. The renewable energy independent power producer procurement programme, a best-fit model for kick-starting renewable energy in South Africa

Building on the dynamics driving the growth of renewable energy in the country, the South African government has progressively developed a procurement framework to shape and support large-scale renewable energy-based power generation. Several initial attempts failed to effectively procure power from IPPs. Initial programmes, such as the Pilot National Cogeneration Programme (PNCP), the Medium Term Power Purchase Programme (MTPPP) and the Multisite Base-load Independent Power Producer Programme (MBIPPP) were conceptualised, designed and administered by Eskom in 2007-2008, with the primary objective of contributing to generation capacity expansion. However, no power purchase agreements (PPAs) between Eskom and IPPs were signed under these programmes, which were all interrupted due to the lack of readiness from both government and the private sector (Department of Energy, 2009a; Yelland, 2009). Following the failure of early procurement programmes, government needed to create a credible IPP procurement programme. NERSA accordingly developed a REFIT mechanism to procure power output from qualifying renewable energy generators at predetermined prices. Faced with political and legal challenges, the REFIT policy was, however, abandoned in favour of the current auction system (Baker, 2012; Creamer, 2011). Following a lengthy transition process, the Department of Energy, with assistance from National Treasury's Public-Private Partnership Unit, launched the REIPP procurement programme in August 2011.

The first phase of the REIPP procurement programme has been designed with an initial allocation of 3 625 MW to be procured from IPPs over a maximum of five bid windows by 2016, as determined by the Minister of Energy under Section 34(1) of the Electricity Regulation Act No. 4 of 2006.[4] Table 1 below illustrates the breakdown of energy sources to meet this target as specified in the Request for Proposals and reveals the significant targets set for onshore wind and solar photovoltaic (PV) technologies and the increasing interest in

[4] Additionally, 100 MW have been set aside for small-scale renewable energy projects to enable new entrants, which may not have the support of international partners, to participate.

concentrated solar power (CSP), in line with developments around the country's current electricity plan.

Table 1: Total megawatt awarded per technology, bid responses and preferred bidders in the REIPP procurement programme

Awards (MW)	Initial determination (2012-2016)	Second determination (2017-2020)	Round 1 Allocation	Round 2 Allocation	Round 3 Allocation	Total Allocation
Wind	1 850	1 470	634	563	787	1 984
Solar PV	1 450	1 075	632	417	450	1 499
CSP	200	400	150	50	200	400
Small Hydro	75	60	0	14.3	0	14.3
Landfill Gas	25	47.5	0	0	18	18
Biomass	12.5	47.5	0	0	16.5	16.5
Total	3 625	3 100	1 416	1 044.3	1 456	3 916
Bid Responses Received	N/A	N/A	53	79	93	225
Preferred bidders	N/A	N/A	28	19	17	64

Source: TIPS, based on Department of Energy, 2013a and Department of Energy, 2012b.

While no capacity cap (other than the total allocation of the programme) was set in the first round, the allocation for subsequent rounds has been determined based on the initial market response to encourage competition in the renewable energy sector. The final allocation per round appears quite flexible and mostly determined by market dynamics. The first three rounds of the programme have largely been oversubscribed, a testament to the interest for the programme, and resulted in committed investment of ZAR 150 billion.

The number of bid responses has increased dramatically with each round, along with a decrease in the number of successful bidders, illustrating the increasingly competitive nature of the programme. In the first round, 53% of received bid responses were selected as preferred bidders. This proportion decreased to 24% in the second window and further to 18% in the third bid window.

Over the first three bid windows, a total of 3 916 MW has been procured, i.e. more than the original allocation of 3 625 MW.[5] In December 2012, the Department of Energy published an

[5] Looking at the difference between the actual ministerial determination and the procurement process, the allocation for onshore wind, solar PV and CSP have been already exceeded for the 2012-2016 period.

additional determination of 3 100 MW for the 2017-2020 period,[6] bringing the total determination to 6 725 MW (as well as 200 MW for small-scale project). Of this additional determination, 307.5 MW were made available for the third bid window, with 200 MW for CSP, 47.5 MW for biomass and 60 MW for small hydro (Department of Energy, 2013b). *De facto*, a part of the third round as well as upcoming bidding windows for the 2014-2016 period are already carving up the determination for the 2017-2020 period, essentially due to the positive market response and the excellent quality of projects.

In addition to these first three rounds, the Department of Energy is considering the appointment of additional preferred bidders for onshore wind and solar PV as part of an extension of the third round (Creamer, 2013a). A special round for 200 MW of CSP capacity, dubbed 'Round 3.5', with the submission date of 31 March 2014, is currently being implemented and a fourth round, which should close on 18 August 2014, is being considered (Department of Energy, 2013c). Going forward, yearly targets of 1 000 MW have been established by the Department of Energy in line with the country's electricity plan, although the allocation might be revised with the update of the plan in March 2014 (Creamer, 2013b).

The success of the programme has been evidenced by the positive response received from developers, investors and financiers, as well as local and international manufacturers, who have actively participated in the programme. Practically, all projects selected as preferred bidders have so far reached financial close and the first REIPP procurement programme project, Scatec Solar's 75-MW solar PV plant, was connected to the grid three months ahead of schedule in September 2013 (Clover, 2013). These positive achievements were no accident and result from continual policy and regulatory learnings from previous initiatives as well as the iterations of the current programme. Identifying and reflecting on the lessons learned through South Africa's journey is fundamental in understanding the roots of the present accomplishments, further improve the existing scheme and lay the foundations to successful future procurement programmes in the energy sector and beyond.

4. Seven key lessons arise from South Africa's journey to procure large-scale renewable energy-based electricity

4.1. Policy space and political support are pre-requisites

From the publication of the 2003 White Paper on the Renewable Energy Policy of the Republic of South Africa (Department of Minerals and Energy, 2003), which set the objective of generating 10 000 gigawatt-hour (GWh) of renewable energy by 2013 (approximately 4% of the energy mix), to the procurement of the first megawatt of generation capacity in 2011, a long and complex policy development process took place in South Africa. Only when policy certainty on the role of renewable energy and the associated investment strategy (i.e. the role of the private sector) was achieved, could the procurement framework be successfully implemented.

South Africa has been considering the introduction of IPPs, partially for the generation of renewable energy-based electricity, since the 1998 White Paper on Energy Policy (Department of Minerals and Energy, 1998). A blueprint for a competitive electricity supply industry including a power exchange, the unbundling of distribution and transmission and a

[6] The 2012 ministerial determination also includes 100 MW for small-scale projects.

partial unbundling of generation was accordingly produced for Cabinet in May 2001 but was eventually discarded in May 2004. Only the gradual introduction of IPPs resulted from the 2001 blueprint, with Cabinet approving in 2003 the participation of the private sector in the electricity industry and resolving that future power generation capacity would be divided between Eskom (70%) and IPPs (30%) (Steyn, 2013), while the utility retained its assets and its ability to invest in new capacity. In a statement on 5 September 2007, Cabinet designated Eskom as the single buyer of power from public and private producers, mandating the state-owned enterprise to ensure that 'adequate generation capacity is made available and that 30% of the new power generation capacity is derived from IPPs' (GCIS, 2007). Cabinet further specified that over the 2007-2027 period, 'Eskom will build all nuclear power plants in South Africa and the IPPs will build more than 50% of all non-nuclear power plants' (GCIS, 2007).

Recognising the cost trends of energy sources, particularly the decrease in the levelised costs of renewable energy technologies, and the increasing role to be played by IPPs in the country's energy market, renewable energy has been progressively featuring in energy planning from 2009.

The Integrated Resource Plan (IRP), promulgated in its first version on 31 December 2009 (Department of Energy, 2009b) and revised on 29 January 2010 (Department of Energy, 2010), covered the 2009-2013 period and planned for the development of an IRP for the 2010-2030 period. It was meant to give effect to the objective enshrined in the 2003 White Paper on the Renewable Energy Policy and constitutes the first energy planning document to meaningfully position renewable energy technologies in South Africa. However, it remained very modest with 100 MW allocated to the CSP-based Sere demonstration project as well as 1 445 MW to be shared between the MTPPP, opened to all technologies, and the REFIT scheme.

Large-scale commitment to renewable energy was only achieved in 2010 with the Integrated Resource Plan for Electricity 2010-2030 (IRP 2010). After an initial round of consultation in June 2010, the first version of the IRP 2010 was published for further comments in October 2010. It planned for 11.4 GW of new build renewable energy over the 2010-2030 period, in addition to 1.1 GW of already committed capacity. In this initial scenario, renewable energy would account for 30% of the country's additional new capacity to reach 7.5% of electricity production in 2030. After a second public consultation process in November and December 2010, the IRP 2010 was revised and promulgated in May 2011. Two of the main changes were the disaggregation of renewable energy technologies to explicitly display solar PV, CSP and wind options, and the inclusion of learning rates, which mainly affected renewable energy technologies. This resulted in the procurement of additional new renewable energy technologies (solar PV, CSP and wind) being brought forward and extended to 17.8 GW, notably to accelerate the development of a local industry. The revised IRP 2010 intends for renewable energy technologies (solar and wind) to supply 42% of the new additional capacity over the 2010-2030 period or 9% of the total electrical energy in 2030 (Department of Energy, 2011).

These two concomitant policy trends on the role of renewable energy and IPPs have shaped the development of procurement programmes in the country.

Early programmes designed and implemented by Eskom were not as large and scaled as the more recent REFIT scheme and the REIPP procurement programme, essentially owing to the

lack of clear support from policy and planning in the energy sector. A clear policy space for renewable energy was only ensured in South Africa with the IRP 2010 and the ministerial determination on renewable energy. This clarity assured investors, through policy and planning, that renewable energy would play a sizeable and central role in the country's electricity mix. It also opened the door for the design and implementation of an ambitious procurement mechanism, providing further certainty on the demand for renewable energy and assurance on the procurement conditions.

Benefiting from the positive evolution of the policy space, the REFIT programme, in development since 2007, was set to be the national procurement framework for renewable energy. The scheme had largely resolved the flaws that characterised previous initiatives and developers had already selected sites, concluded environmental impact assessments and resource measurements in preparation to submit their projects to participate in the REFIT policy (Eberhard, 2013). As concerns and challenges arose in 2008/2009 around the REFIT policy, the rationale underpinning the shift from a feed-in tariff to an auction programme took prominence, eventually leading to the introduction, with full political support, of the existing competitive bidding procurement process.

Going forward, long-term certainty on the future of the procurement scheme, in terms of megawatt capacity and technology, must be maintained. The publication in November 2013 of an update of the IRP, by re-shuffling some parameters, has triggered a wide array of comments on various aspects of the draft revision. The updated version relies on revised assumptions in terms of economic growth, future demand, technology options and costs, the performance of Eskom's generation fleet and the potential for extending the economic life of the existing fleet. In terms of renewable energy, it advocates that the current renewable energy programme should be continued, with additional annual rounds (of 1,000 MW capacity for solar PV, 1,000 MW for wind and 200 MW for CSP), with the potential for hydropower at competitive rates. Overall, the update slightly reduces the allocation to renewable energy from 18.8 GW to 17.4 GW and suggests a shift from wind to solar energy in the coming years, by cutting the total generation capacity allocated to wind energy in 2030 (from 9.2 GW in the current IRP to 4.4 GW in the 2013 update) and increasing the share of solar PV (from 8.4 GW to 9.8 GW) and CSP (from 1.2 GW to 3.3 GW) (Department of Energy, 2013d).

Revisions to the mix of renewable energy technologies, which put greater emphasis on solar over wind, have engendered mixed reactions, partly due to aggressive learning curves for solar technologies. While solar energy is becoming increasingly competitive, wind technologies are mature and economical. At an average cost of ZAR 0.74/kWh in the third round of the REIPP procurement programme, wind energy currently offers the lowest price per kilowatt-hour (kWh) among renewable energy technologies and is almost 30% below the likely cost of electricity to be supplied by the Medupi coal-fired power station. Additionally, according to the South African Wind Energy Association, '[t]he modelling proceeds implicitly as if all energy plants will be built on the country's balance sheet. The enormous risk and opportunity costs of Eskom building are disregarded for modelling purposes,' setting aside the success of IPPs in delivering projects (Creamer, 2014).

4.2. Institutional arrangements are at the crux

Over and above policy and political support, the design and implementation of successive IPP programmes in South Africa has raised the importance of institutional arrangements on two

fronts. First, institutional leadership and political will (to take and implement decisions) are cornerstones of a successful procurement programme. Second, the active participation of all relevant stakeholders is essential to an effective and efficient design and implementation.

Thus, early programmes driven by Eskom largely failed as a result of inadequate leadership, oversight and political support. Project developers were reluctant to participate in the programmes owing to Eskom's role as an industry player, i.e. as a generator, transmitter and distributor, as well as administrator and referee of the programmes, with little oversight to ensure that the utility would not leverage its monopoly in the electricity supply industry. What arose from this early experience was also the need for the procurement programmes to be driven by an independent institution, so as to avoid Eskom playing both participant and referee, and independent price setting, along with clear cost recovery rules not solely dependent on the financial standing of Eskom.

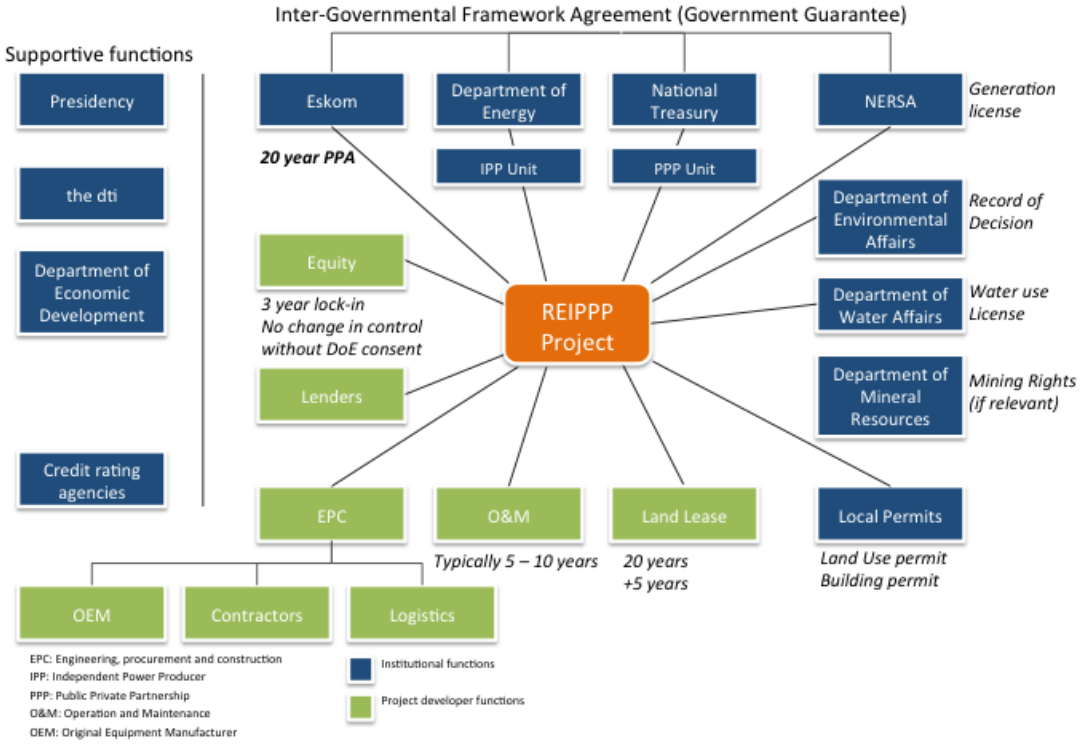
Likewise, while NERSA's REFIT programme was set to be the national procurement framework for renewable energy, it faced increasingly political and legal challenges, which ultimately resulted in its abandonment to the benefit of a Department of Energy-led scheme.

The REFIT policy was conceptualised within NERSA's Electricity Regulatory Division in 2006/2007, following study tours to Germany and Denmark by representatives of the regulator, National Treasury, the Department of Public Enterprises and the Department of Environmental Affairs. Despite some opposition within NERSA itself as well as reluctance from the Department of Minerals and Energy and Eskom, the development of a REFIT policy gained traction at NERSA's board level in June 2007 (Baker, 2012). However, the Department of Energy, supported by the National Treasury, later identified that by developing the REFIT, NERSA was acting beyond its mandate stipulated in the Electricity Regulation Act No. 4 of 2006. According to the Electricity Regulation Act, the function of developing energy policy belongs to the Department of Energy, while NERSA acts as an implementer. While NERSA understood at the time that a programme such as the REFIT was meant to be developed by the Department of Energy, the regulator explains that, owing to administrative issues that caused delays, NERSA ended up initiating the process all within the legislative framework in place at the time (Baker, 2012). The new procurement framework was only introduced in May 2011, two years following the launch of the REFIT, through the New Regulations on New Generation Capacity.

National Treasury and the Department of Energy were convinced that NERSA had neither the budget nor the expertise to efficiently run a REFIT, and that the relatively high prices set by NERSA did not enable the financial feasibility of the programme. The risk of a large oversubscription, notably in relation to Eskom's capacity (financial and grid connection) to procure power from IPPs (Baker, 2012), was particularly concerning as the cost of the utility's new build programme was increasing beyond the original budget (Yelland, 2009). Concern over the financial implications of the REFIT policy became apparent, particularly regarding

whether sufficient cost-recovery mechanisms were in place to prevent Eskom from defaulting on government-underwritten PPAs (Baker, 2012).

Figure 1: Institutional arrangements around the REIPP procurement programme



Sources: Pickering, 2013 and Haffejee, 2013.

In January 2009, the then-DME put forward a consultation paper on electricity regulation proposing a bidding system. Importantly, the document shifted the strategic and planning responsibilities from NERSA to Eskom, and gave the Minister of Energy wide discretion regarding NERSA's REFIT process (IDASA, 2010). In August 2009, the Department of Energy's Electricity Regulations on New Generation Capacity, which include a section on procurement of renewable energy and cogeneration, were approved (Department of Energy, 2009c). This followed the Department of Energy receiving legal advice that feed-in tariffs could be challenged against public finance and procurement laws. Evidence suggests that a REFIT would have been inconsistent with the Public Finance Management Act No. 1 of 1999 (as amended) due to the absence of price competition. The 'first come first serve' basis upon which bids would have essentially been chosen under the REFIT was considered not to be in line with the procurement regulation that stresses competitive bidding. Within this legal framework, an auction system does more to encourage price competitiveness among developers than the feed-in tariff. This analysis has, however, been challenged by some analysts, who argue that although price would not have been a differentiating factor, competition would have occurred based on other criteria, most likely local economic development, domestic manufacturing, black economic empowerment, employment creation and social development (Creamer, 2011).

Thus, in November 2010, the Department of Energy, supported by National Treasury, published the New Generation Regulations. The regulations effectively removed NERSA and Eskom's functions to implement a REFIT, and replaced the scheme with a competitive bidding

process under the governance of the Department of Energy and National Treasury (Department of Energy, 2009c). Subsequently, recognising that the new regulations made the REFIT inconsistent with the law, NERSA concurred with government's bidding process and abandoned the idea of implementing feed-in tariffs (Creamer, 2011). The feed-in tariff was effectively never implemented and not a single megawatt of power was signed in the two years since the launch of the REFIT programme.

Ultimately, the political play between NERSA and the Department of Energy over procurement processes appeared to become a dispute over turf, and the change in regulation was more a political matter than a technical problem. What is certain in the shift from the REFIT to the REIPP procurement programme is that NERSA's role has been significantly diminished. The regulator was largely responsible for designing and administering the REFIT. Under the REIPP procurement programme, NERSA is given the task of awarding generation and distribution licences to successful IPPs (in order for them to reach financial close), with less autonomous decision-making power about the role of renewable energy. While facilitating the entry of IPPs into the electricity generation market, and importantly, ushering in renewable energy in the energy supply mix, the shift to a Department of Energy-led bidding process served to shrink NERSA's role, the initiator of the REFIT, reinforcing direct governmental control over the development of renewable energy in the country.

The political will and leadership (emanating from the Department of Energy and National Treasury) that drove the establishment of the programme were key drivers in ensuring its success. The two institutions are central in drafting the request for proposals, which largely determines the scale of megawatt capacity in each bid window and the methodology for project selection. The Department of Energy, as driver and coordinator of the programme, has provided policy clarity and a directive for renewable energy development. This is complemented by the financial support and backing of National Treasury and technical input into the process from the public-private partnership unit.

Overall, while these developments have positioned the Department of Energy and National Treasury as the main drivers of the programme, all relevant stakeholders are actively involved in the design and implementation of the scheme, as illustrated in Figure 1 below, in comparison to previous initiatives, which relied heavily on one single institution. Other government departments provide advisory inputs as per their areas of expertise, such as the Department of Trade and Industry (the Department of Trade and Industry) on local content and the Department of Environmental Affairs on environmental consents. NERSA is then responsible for awarding generation and distribution licences to successful project companies for the period, and megawatt capacity in line with the PPA. This is, however, more an instruction that the regulator carries out as stipulated by the request for proposals than an independent decision. Eskom's System Operator is responsible for designing and ensuring that the grid infrastructure can equitably accommodate renewable energy projects to feed into the national grid. The utility's grid access unit provides technical analysis on the connection of projects to the grid and supplies IPPs with cost estimate letters and budget quotes on these options. Whereas Eskom and NERSA were the architects of previous independent power procurement programmes and remain instrumental to the success of the programme, they both now have secondary decision-making functions in the process. Last but not least, project developers and the community of financiers, in addition to developing and financing renewable

energy projects which have made the success of the programme, are dynamically considered in the continual improvement of the scheme.

Owing to the complex and interconnected nature of institutional arrangements associated with the REIPP procurement programme, there are still potential areas of improvement. For example, issues around the grid connection and associated processes, which create uncertainty for IPPs, should be mitigated. IPPs rely on Eskom to obtain a cost estimate letter and budget quotes in a timely fashion for their grid connection. Uncertainty around the timeline for grid connection and the lack of accuracy of the cost estimate letter and budget quotes provided by the utility, which are respectively accurate at +/-40% and +/-15%, have raised some financial risk for IPPs, which need to factor connection costs in their business model. While the REIPP procurement programme mitigates the uncertainty associated with the actual grid connection, processes to determinate the costs and timeline of such connection, which are dependent on Eskom, still could be improved to provide more certainty to IPPs. Ultimately, more certainty is required at the time of submission to enable efficient planning and ensure the lowest possible prices and maximum economic development benefits. Another illustration is the misalignment of multiple authorisation levels from national, provincial and local authority level and the associated application processes, which should be streamlined and fast-tracked, particularly in the case of water licences, to facilitate project development.

While ameliorations could still be achieved on the coordination of all involved institutions, the success of the REIPP procurement programme lies in the inclusion of all stakeholders from government departments, to the regulation and the state-owned utility, to the private sector. Had just one of these vital players been missing from the programme design and consultation, the scheme would have undoubtedly not been such an overwhelming success.

4.3. Market readiness underlines the positive response of the private sector

The readiness of the domestic market, progressively built over a number of years, has played a critical role in the positive response to the REIPP procurement programme. As such, the existing programme has benefited from previous initiatives and schemes, which contributed to preparing both domestic and international private developers for their entry into the electricity market in South Africa.

Early programmes developed by Eskom did not result in the procurement of renewable energy, essentially owing to the lack of coordination from both the South African Government and the private sector. A number of developers for example registered ideas that could not quite be implemented as viable projects. Despite failing to take off, these programmes prepared and tested the market. They created expectations and constituted building blocks of the current achievements (Department of Energy, 2009a; Yelland, 2009).

Similarly, the REFIT programme, which had largely resolved the flaws that characterised previous endeavours, was instrumental to the enthusiastic market response experienced in the REIPP procurement programme. As such, preferred bidders from the first round of the REIPP procurement programme were predominantly developers who prepared to submit projects under the REFIT programme. While developers did not have a strong preference for either the feed-in tariff or the tender system and the change in the procurement framework came as an unwelcomed surprise, developers who were already prepared to submit projects under the REFIT programme were the most ready to compete under the initial round of the

REIPP procurement programme. Many renewable energy project developers had indeed already secured sites and had initiated energy resource measurements and environmental impact assessments as per the REFIT guidelines (Eberhard, 2013).

The unexpected change in the procurement framework nevertheless raised concerns over whether there would be further changes, without notice or consultation going forward, i.e. would this remain government's *modus operandi* to deal with IPPs? This became an important consideration in the design of REIPP procurement programme, which institutionalises continual engagement with the private sector. In addition, the Department of Energy provides valuable feedback on the evaluation of unsuccessful bids, allowing project developers to improve the quality of their bids and often resubmit unsuccessful projects in subsequent windows.

Furthermore, the design of the REIPP procurement programme was tailored by the Department of Energy and National Treasury to the South African context, against the initial prescriptions of international advisors. The scheme was conceived as a rolling programme, and not a once-off exercise, which contributed to creating market certainty, confirmed the readiness of the private sector and encouraged the participation of developers. Adequate intervals between bidding rounds have allowed the Department of Energy the flexibility to respond to design challenges (in order to maximise benefits for the country) as well as issues raised by the private sector. This resulted in a growing interest from the private sector, attested to by the increasing number of bids received, from 53 proposals in the first round to 79 and 93 in the second and third rounds respectively (Department of Energy, 2013a). The maximum size for a single project was also adjusted (at 75 MW for solar PV and 100 MW for CSP for example) to match local requirements and characteristics.

Well-structured, timely and tailor-made implementation, to match and further build market readiness, has been vital for establishing confidence and certainty in the market and preparing all players. Linking the programme design, i.e. demand, with the market response, i.e. supply, has constituted a keystone of the significant interest from the private sector and ultimately the success of the REIPP procurement programme.

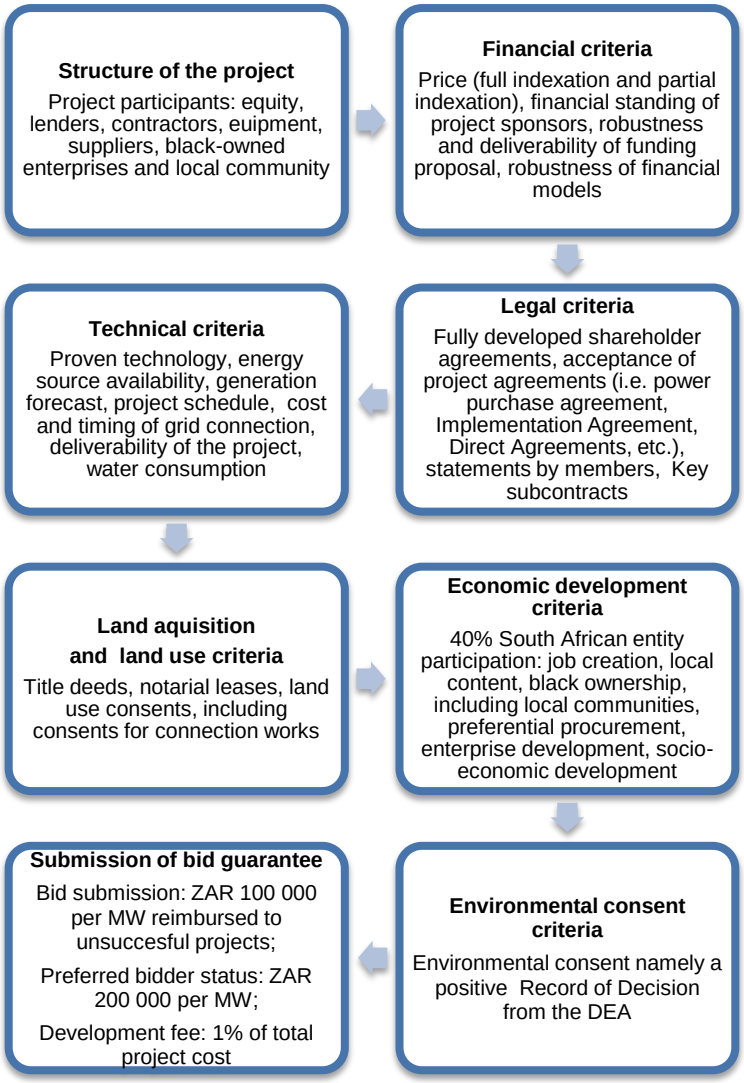
4.4. Fair, transparent, and consistent evaluation criteria provide effective guidelines for the market

With regards to the actual implementation of a procurement programme, the publication of transparent, consistent and independently-reviewed evaluation criteria has emerged as a critical condition for the private sector.

Early programmes lacked clear frameworks for the evaluation of bids and evaluation criteria for the REFIT policy were never finalised. Draft criteria were, however, published in February 2010 and integrated into the REIPP procurement programme. The current evaluation framework, building on the experience of the REFIT policy, ensures a fair and levelled playing field for all participants. Financiers have commended the programme for the extensive due

diligence required of developers in their bids, as well as its clarity and reliability. The evaluation process of the REIPP procurement programme is composed of two clear-cut phases.

Figure 2: Pre-qualification criteria of the REIPP procurement programme



Source: TIPS, adapted from Campbell, 2012.

In a first pre-qualification stage, bidders must meet a set of minimum criteria. This initial assessment is conducted by teams of independent experts. As illustrated in Figure 2 above, a comprehensive evaluation matrix has been established (Campbell, 2012). Bidders have to first satisfy certain minimum threshold requirements in six areas: financial; technical; commercial and legal; land; economic development; and environment. They must *inter alia* demonstrate the readiness of the project (land acquisition, funding, technologies, suppliers, ability to meet deadlines, environmental consent, etc.), its financial viability and the arrangements to meet minimum requirements in terms of economic development. As a rule, and in order to secure local participation, the project company must also comprise 40% participation by a South African entity. The Department of Energy requires detailed and comprehensive bids. Failure to include all required information, and not have this information available on request during the evaluation period, is grounds for elimination. Bids meeting all

these initial requirements are admitted to the second stage of the auction, where they are assessed on a competitive basis.

In the second stage of the evaluation process, bids are reviewed based on weighted criteria, namely 70% for their price offer and 30% for their additional contribution to economic development (i.e. over and above minimum requirements). Within the 30 points (out of 100) which are awarded for economic development, different components are weighted as follows: job creation (25%), local content (25%), ownership (15%), management control (5%), preferential procurement (10%), enterprise development (5%), and socio-economic development (15%) (Department of Energy, 2013b). For each category, points are allocated based on minimum desired targets, over and above minimum thresholds. In a given category, only meeting the minimum threshold translates into zero point while reaching the target grants the maximum number of points. From the threshold to target, a linear relationship determines the total of points awarded to the bid. This system is meant to ensure minimum economic development contributions from project developers while encouraging them to aim for higher targets. Table 2 illustrates these thresholds and targets for local content across the first three bidding windows.

Table 2: Local content requirements across bidding rounds of the REIPP procurement programme

Bidding Rounds/ Technology	**Bidding Round 1**		**Bidding Round 2**		**Bidding Round 3**	
Criteria	Threshold	Target	Threshold	Target	Threshold	Target
Onshore wind	25%	45%	25%	60%	40%	65%
Solar PV	35%	50%	35%	60%	45%	65%
CSP without storage	35%	50%	35%	60%	45%	65%
CSP with storage	25%	45%	25%	60%	40%	65%
Biomass	25%	45%	25%	60%	40%	65%
Biogas	25%	45%	25%	60%	40%	65%
Landfill gas	25%	45%	25%	60%	40%	65%
Small hydro	25%	45%	25%	60%	40%	65%

Source: TIPS, based on Campbell, 2012.

The evaluation mechanism has contributed tremendously to creating certainty and ensuring the participation of project developers to the programme. Clear and consistent criteria have enabled fair competition in the renewable energy market and the selection of the most competitive bids. The rigour required to meet evaluation criteria and each step in the bidding

process, while welcomed by the private sector, has nevertheless proven to be extremely time consuming and expensive. Key advisors, such as legal experts, are particularly costly for project developers and can represent up to 15% of project development costs. The need to reduce the cost of meeting all requirements has arisen for IPPs. As such, the design of the evaluation criteria, particularly their stringency, is reviewed between every bidding window, factoring market dynamics and local capabilities, notably in terms of local content requirements.

4.5. Financing hinges on a bankable power purchase agreement

Not only did the market require clear guidelines for IPPs, but banks needed the assurance that deals could be structured around reasonable and sensible terms and aligned to their investment mandates. The power purchase agreement (PPA), which is the only source of revenue for developers and for commercial banks financing IPPs to ensure debt repayment and adequate return on investment, is the cornerstone of the success of any IPP programme. Most notably, the PPA is used to divide and allocate risk between all parties involved. A multitude of risks can be associated with the construction and profitable operation of a power plant, from fuel price and supply,[7] foreign exchange, environmental assessments and authorisations, the connection to the transmission and distribution networks, revenue collection, to timely and on-budget plant construction and plant operation. From the point of view of IPPs, and financial institutions backing their projects, the only acceptable risks that project developers can shoulder are linked to building and operating the power plant. All other risks must be mitigated by the state, between the utility, National Treasury and the Department of Energy. Appropriate risk allocation, particularly in the form of a bankable PPA, has been key in unlocking finance for the renewable energy sector.

The slow uptake and largely the failures and discontinuation of the early programmes can be largely attributed to problems around financing and risk allocation as well as the policy and planning environment at the time. The allocation of risk among parties in the PPA was unsatisfactory and the programmes did not offer an appropriate term (suggested between 15 to 20 years) for relevant technologies. Eskom's bias in the programme design resulted in developers being expected to take on risks that their lenders would not support. Under the PNCP, developers were to take on the fuel supply risk, i.e. relying on government to supply them with the necessary fuel and bear the cost should government default on consistently supplying the agreed fuel amount (Department of Energy, 2009a; Yelland, 2009). IPPs were also asked to take on the fuel price risk as NERSA could not guarantee the tariffs would change in relation to the price of fuel charged to IPPs (Exxaro, 2011). In the cases of the PNCP and the MTPPP, PPAs allocated no risk to Eskom should the utility default on purchasing the agreed amount of power from generators or fail to connect power plants to the grid. The risks posed to IPPs to generate power and receive payment for that power was negatively received by financiers that would not support a PPA under these conditions. Ultimately, commercial banks were not ready to finance projects for which the revenue stream (electricity sales) could be compromised by inefficiencies in the hands of the utility.

Appropriate risk allocation continued to be a problem in the REFIT programme. NERSA's (2009a) initial draft of a PPA for the REFIT scheme in July 2009 was criticised by developers and investors for allocating too much risk to IPPs (Baker, 2012). Developers identified that

[7] This risk is by definition not applicable to renewable energy-based plants.

there was no stabilisation clause for law changes, which posed a realistic risk, as demonstrated in previous procurement programmes which were abandoned without compensation to IPPs (Brodsky, 2010). The PPA did not adequately delimit the buyer of renewable energy. Given government's clear intention to introduce an Independent Market and Systems Operator (ISMO), this did not guard against the consequences of a restructuring of the electricity supply industry. Neither was the Renewable Energy Purchasing Agency (REPA) clearly defined. While NERSA's guidelines and the PPA referred to Eskom's Single Buyer Office as the REPA, the 2009 Electricity Regulations on New Generation Capacity define a buyer as 'any person or entity designated by the Minister in terms of Section 34(1)(c) and (d) of the [Electricity Regulation] Act and authorised under a licence'. Consequently, no PPA was signed with Eskom at that stage, as developers and banks insisted on a PPA that would be underwritten by government.

The inability of different stakeholders to agree on how to apportion risk was a key reason for the halt in signing PPAs. On the one hand, although general principles emerged, there was no consensus among private lenders on what constituted a bankable PPA as each bank had different risk appetites. The PPA is the primary agreement that secures the revenue of renewable energy projects, which in turn, ensures that IPPs and their financiers will make a return on their debt. In other words, the availability of money and the risk appetite determine the level of risk that each bank is willing to accept. On the other hand, National Treasury was wary of providing a PPA that would be underwritten by government, as this would threaten the country's balance sheet. At the same time, National Treasury recognised that developers were unwilling to enter into a PPA underwritten by Eskom alone (Baker, 2012; Eberhard, 2013).

NERSA attempted to redraft the PPA following public comments from the private sector. This process was overtaken by the private legal firm, Webber Wentzel, as responsibilities for REFIT began to shift from NERSA to the Department of Energy and National Treasury.

Under the REIPP procurement programme, the PPA is held for a period of 20 years and in local currency, and allocates risk between the parties based on investment-friendly terms. It guarantees payment of an agreed tariff for power generated on a take-or-pay basis (Stemple, 2013). Essentially, this means that irrespective of power demand by the grid, if the power is generated by the renewable project, the tariff will be paid by Eskom for each kilowatt of energy produced. The tariff is agreed upon the award of the preferred bid status and is indexed to the rate of inflation over the duration of the contract with Eskom.

On the one hand, the agreement is underwritten by National Treasury should Eskom default on the terms of the agreement. This includes if Eskom fails to connect renewable energy projects to the grid and if the utility fails to pay for the generated electricity. Under this PPA, Eskom is accountable to National Treasury and has a vested interest to ensure grid connection. The Department of Energy has also separately contracted with the project companies in order to offer recourse for project investors in the event that Eskom fails to meet its obligations under the PPA. Under the Direct Agreement between the Department of Energy and the lenders of the project, the Department of Energy, underwritten by the National Treasury, commits to taking on payments due to the project company should Eskom default

on payments. This government backstop of the PPA has earned the REIPP procurement programme significant credibility with international investors (Stemple, 2013).

On the other hand, should the project company fail to generate the contracted energy, the lenders are asked to step in and find a replacement project company, if feasible. If not, the allocation for that project could be put up for bid in subsequent rounds. In the case of IPPs defaulting on supplying the agreed amount of electricity due to weather instability or plant degradation or destruction, the liability falls on the IPP and the renewable project's financiers. In this case, commercial lenders include comprehensive insurance to cover the loss and protect the developer, as part of the project finance. Should there be an inability to generate electricity caused by a fault in the construction of the plant, the liability falls on the contractor as agreed in the Engineering, Procurement and Construction (EPC) contract, the predominant form of construction contract used on large-scale infrastructure projects. In other cases, the developer can take on the responsibility of construction and operation. Lenders normally require the EPC contracts to provide, as an integrated package: a fixed completion date; a fixed completion price; no or limited technology risk; output guarantees; liquidated damages for both delay and performance; security from the contractor and/or its parent; large caps on liability (ideally, there would be no caps on liability, however, given the nature of EPC contracting and the risks to the contractors involved there are almost always caps on liability); and restrictions on the ability of the contractor to claim extensions of time and additional costs (DLA Piper and Hofmeyr, 2012). Should there be a dispute between IPPs and Eskom over terms not being met in the PPA, the responsibility of mediating the conflict falls squarely on NERSA.

In relation to risk allocation and financing, some modifications are recommended for improving the financial close phase. The financial close process should be revised to prevent delays by matching the signing of the PPA and the Implementation Agreement (between the Department of Energy and the project company) with the date of financial close. While the South African government carries the foreign exchange risk between the bid submission and the signature of the PPA and the Implementation Agreement (allowing IPPs to adjust their price offering for any evolution of the exchange rate in between the two dates), project developers are exposed from the signature to the date of financial close (around one month). The financial close process should also better integrate EPC contractors as initial contractual terms are substantially renegotiated after the award of the preferred bidder status to ensure the best and most competitive offer.

The significance of the PPA is regarded as a crucial factor in the success of the REIPP procurement programme by commercial banks and IPPs. Notably, the allocation of risk between all stakeholders has contributed to a bankable PPA. The upward trend of bids received as the rounds have progressed indicates the success of the programme to attract significant interest from developers in the sector.

4.6. Getting the price right is as important as learning how to get it right

A critical factor in establishing a viable programme for renewable energy is the price of the procured electricity. From a government perspective, getting the price right remains one of

most challenging tasks. In this regard, feed-in tariffs and auction systems are fundamentally different in their approach.

A REFIT policy is structured around pre-determined tariffs. Setting the appropriate tariff is, however, a very difficult endeavour as it requires substantial information, skills and capabilities, and the risk of setting the price at the wrong level is high. This could result in, on the one hand, excessively generous economic rents for developers and inflated electricity prices, or on the other hand, no interest from the private sector and thus the failure of the programme.

Instead of setting the price, an auction system, such as the REIPP procurement programme, relies on market dynamics to obtain the best price. It nevertheless requires the establishment of mechanisms to encourage rivalry and mitigate risks associated with the lack of competition or competitive behaviour (such as price and allocation caps).

In December 2008, NERSA released a consultation paper in which it proposed a set of tariffs regarded as close to international standards. At the public hearings on the consultation paper, stakeholders stressed that tariffs were too low to make any renewable energy project viable and called for NERSA to review them in order to create a viable renewable energy market (Baker, 2012). These tariffs and their successive revisions in 2009 and 2011 are presented in Table 3.

In March 2009, NERSA released revised tariffs fully indexed on inflation designed to cover generation costs plus a real return on equity of 17% (NERSA, 2009b). Unlike original tariffs, these were generally regarded as generous by developers (Eberhard, 2013). The private sector, through an informal advisory committee notably composed of leading South African banks, played an influential role in their calculation. The March 2009 tariffs were calculated on the assumption of a high interest rate and a high dollar exchange rate, and input from developers who were hoping for a higher return. NERSA stated that the 2009 tariffs were set at these higher than international levels to, not only ensure a return on investment for developers, but also to incentivise a small renewable energy market and the long-term commercial viability of the sector (NERSA, 2009c).

Nevertheless, developers expressed apprehension around the financial capacity of the South African government to sustain tariffs at these levels over the 20-year lifetime of the PPA (Eberhard, 2013; NERSA, 2011). Such high tariffs would create excessive profits for IPPs and make electricity less affordable for consumers. In turn, this could impede innovation among developers for more cost-cutting, efficient and better quality technologies and result in inefficient operations (Eberhard, 2013).

In March 2011, NERSA unexpectedly released a consultation paper with lower feed-in tariffs, arguing that a number of parameters used in 2009, such as exchange rates and the cost of debt, had changed (NERSA, 2011). New tariffs were in line with international trends in the cost of renewable energy technologies, which had decreased since 2009. There was speculation that the cut may have also been an attempt to trade lower prices for a larger allocation of renewable energy to be included in the IRP 2010. The lower tariffs did not raise concerns among developers, who were reassured by the larger allocation of independent generation capacity (Eberhard, 2013). The March 2011 tariff revisions also signalled a shift in the tariff structure. Notably, the capital component of the tariffs would no longer be fully indexed on

inflation. However, NERSA maintained the required real return for equity investors of 17% in its final revision (NERSA, 2011). The successive changes operated by NERSA and the mixed reactions that these triggered illustrate the difficulty of the exercise. As the regulator and the private sector appeared to come to an agreement on feed-in tariffs, the shift to an auction system and the involvement of Department of Energy and National Treasury changed the procurement design and implementation.

With the transition from a feed-in tariff to an auction system, a pricing mechanism was no longer required. Tariff caps, determined by the Department of Energy, were however used to limit the risk of high prices linked to *inter alia* a lack of competitive behaviour, particularly for the first bidding window. While the 2009 REFIT tariffs were initially thought to constitute the upper limit, new price ceiling were published, as summarised in Table 3 below. The Department of Energy has also set a limit on the megawatt capacity of each technology as well as a maximum size per project.

Table 3: REFIT tariffs (2008-2011) and REIPP price caps

Technology	December 2008	March 2009	March 2011	REIPP R1 Price Cap	Round 1	Round 2	Round 3
Wind	0.66	1.25	0.94	1.15	1.14	0.89	0.66
CSP	0.61	2.10	1.84	2.85	2.68	2.51	1.46
Solar PV	--	3.94	2.31	2.85	2.75	1.65	0.88
Small Hydro	0.74	0.94	0.67	1.03	--	1.03	--
Landfill gas	0.43	0.90	0.54	0.84	--	--	0.84
Biomass	--	--	--	1.07	--	--	1.24

Source: TIPS, based on Department of Energy, 2013a; Greyling, 2012; NERSA, 2011.

New developers were not yet ready to put forward competitive bids in the first window, which was utilised in many ways as a round of observation. In addition, no capacity cap (other than the total allocation of the programme) was set in the first round, resulting in a lack of competition and failing to create pressure on the bidders to reduce their price offering. As a result, prices in the first round ended up very close to the prescribed ceilings. In addition, price caps set too low played a part in the absence of successful projects in the first two rounds for some technologies, such as landfill gas and biomass.

In order to stimulate competition and drive prices down, the maximum generation capacity was capped in the second and third bidding windows and the price ceilings per technology were adjusted (downward in the case of solar PV, CSP and wind). Tariffs have significantly dropped over the three rounds, well below the required price ceilings, as indicated in Table 3. For example, prices plummeted on average from ZAR 2.75/kWh to 88c/kWh for solar PV, and from ZAR 1.14/kWh to 66c/kWh for wind. This trend essentially resulted from project developers being more experienced and familiar with the programme, an increased maturity of technologies, aggressive (price) competition, reduced price ceiling for some technologies,

such as wind and solar, and the allocation of a capacity limit for each technology from the second round onwards. As a result, prices received for the second and third auction rounds were very competitive and even lower than expected (IRENA, 2013b).

The use of an auction system, with the appropriate risk mitigation mechanisms, has reduced the complexity of price setting for the South African government and allowed for prices to decrease rapidly as a response to increased competition, technology maturity and improved developers' experience. This success story, resulting from a well-crafted combination of price caps, maximum project size and determined allocation, has been one of the major achievements of the REIPP procurement programme. It might, however, have occurred at the expense of other policy objectives associated with the government-run scheme.

4.7. Maximising local economic development centres on understanding the multiple objectives of renewable energy procurement

Reflecting on the four grand dynamics driving the development of renewable energy in South Africa, the REIPP procurement aimed at concomitantly achieving several objectives, from the procurement of additional generation capacity and affordable electricity, to introducing IPPs to the market, to contributing to green economy and broader economic development goals. Understanding and balancing these objectives and the associated trade-offs, essentially in the short term, is instrumental to the successful design and implementation of a renewable energy procurement programme.

While some priorities of the current procurement programme fit perfectly with the overall energy system and the country's policy framework, such as commissioning new generation capacity and contributing to climate change mitigation policies, others appear more conflictual.

The REIPP procurement programme aims to procure affordable renewable energy-based electricity from IPPs. As a nascent industry in South Africa, renewable energy has in the short term required some governmental support, in the form of a price premium. The sustainability of the programme also relies on Eskom's ability to incorporate IPPs onto the electricity grid and procure the contracted power from preferred bidders. This has resulted in budgetary implications for the national utility which have been passed on to consumers through tariff increases. While contributing to tariff increases in the short term, the REIPP procurement

programme will effectively contribute to generate affordable electricity in the medium to long term, based on the continual decrease of the levelised cost of renewable technologies.

Table 4: Committed job creation for selected technologies over the first three bidding rounds

Round	Job creation (in 12 person-months; in 12 person-months per MW capacity)	Solar PV		Onshore wind		CSP	
Round 1	Construction period	2 381	3.8	1 810	2.9	1 883	12.6
	Operational period	6 117	9.7	2 461	3.9	1 382	9.2
	Total project lifespan	8 498	13.4	4 271	6.7	3 265	21.8
Round 2	Construction period	2 270	5.4	1 787	3.2	1 164	23.3
	Operational period	3 809	9.1	2 238	4.0	1 180	23.6
	Total project lifespan	6 079	14.6	4 025	7.1	2 344	46.9
Round 3	Construction period	2 119	4.7	2 612	3.3	3 082	15.4
	Operational period	7 513	16.7	8 506	10.8	1 730	8.7
	Total project lifespan	9 632	21.4	11 118	14.1	4 812	24.1

Source: TIPS, based on Department of Energy, 2013a.

The procurement of renewable energy from IPPs is also designed to contribute to economic development in South Africa. Government aims, through local content and job creation requirements, to stimulate employment generation and develop an industrial base for the local manufacturing of the inputs required in renewable energy projects. Social development outcomes, primarily through community ownership, have also been included as part of the objectives of the programme.

The economic development objectives of the REIPP procurement programme have focused on ensuring that South Africans participate, own and benefit from renewable energy activities in the country. The structure of the programme has been explicit in facilitating this, although economic development criteria remain secondary to price. In the current auction scheme, the emphasis is put on the price offering (accounting for 70% of the selection process) while developmental outcomes are a smaller part of the weighted criteria (30%). Traditionally, government's procurement has been based on 80-90% price consideration (and 10-20% for developmental objectives such as black economic empowerment). The REIPP procurement programme, in advancing a greater proportion to economic development considerations, has attempted to maximise socioeconomic goals.

As price remains the primary selection criteria in the REIPP procurement programme, developers tend to meet the minimum requirements in terms of local content, favouring the price component of their bid. In a system based on a feed-in tariff, the price is pre-determined

and fixed. Provided that the REFIT scheme is not run on a 'first come first serve' basis, developers will tend to compete on other aspects of their projects, such as local content, industrial development, job creation and social development outcomes, to increase their chance of success, and potentially resulting in higher economic development benefits than in the auction system. The logics underlying an auction system and a feed-in tariff are inversed and will tend to bring different benefits, particularly in the short term.

While project developers have committed to job creation, as illustrated in Table 4 above, employment opportunities in the construction and operation of renewable energy-based power plants remain limited. Trade unions have raised concerns about the quality and precarious nature of the jobs generated by the projects, with most employment opportunities created in the communities surrounding projects being for low-skilled security guards.

Table 5: Trend in local content for selected technologies over the first three rounds of the REIPP procurement programme

Round / Technology	Solar PV	Onshore wind	CSP
Round 1	29%	22%	21%
Round 2	48%	37%	37%
Round 3	54%	47%	44%

Source: TIPS, based on Department of Energy, 2013a.

In addition, local content requirements, which are leveraged to stimulate employment and develop domestic capacity, involve short-term trade-offs. As the localisation of green technologies raises the costs of goods, local content requirements can hinder the shift to sustainable development if they are not in line with the country's capacity and capability, and impede the decrease in prices. Targets, and accordingly the local content share of projects, have increased over each bid window to encourage further industrialisation and job creation, as illustrated in Table 5 below. However, the industrialisation envisioned as part of the programme remains constrained owing to the limited megawatt capacity allocated per technology (to create sufficient aggregate demand for international companies to set up manufacturing sites in the country) and the small existing manufacturing base.

The management of community trusts established to meet social development outcomes has also created some unintended consequences. Community trusts are set up with the financial assistance of development finance institutions in order for communities living near the projects, to buy shares in the project companies. Associated revenues, estimated at ZAR9.5 billion collectively over the first three bid windows, are set aside for community-led projects. Concerns have been raised about the concentration of these funds in a limited number of communities, their monitoring and evaluation, and the capacity of the Department of Energy and development finance institutions to manage the funds and ensure IPPs meet their commitments.

In the end, the programme could strengthen its impact on economic development in the country, particularly in terms of local manufacturing and community development, by

establishing strong monitoring and evaluation frameworks and further capacitating project developers in meeting economic development requirements. Setting the appropriate instruments to create aggregate demand (required for the development of local manufacturing) could further contribute to enabling the type of economic development and skilled employment envisioned for this programme. In the short term, however, this is likely to come at the expense of other policy objectives attached to the programme, such as cost affordability and the transition to a green economy, and trade-offs between various objectives must be carefully considered in order to maximise benefits to the country.

5. Conclusion: Taking the lessons forward

The development of the REIPP procurement programme has been a perfect illustration of successful policy and regulatory learning processes.[8] The design and implementation of the programme have incorporated the accumulated experience and lessons from previous procurement initiatives as well as the first phases of the existing scheme. The seven key lessons taken from the development and implementation of successive procurement programmes highlight how challenges have been overcome over time. This hinges on the political will and participation of key players as well as the intentional modification of the programme. Moreover, the South African government is continuously working to further improve the mechanism and remove the remaining issues and bottlenecks. As the programme progresses and expands, ongoing improvements, to respond to challenges that arise, will be required to ensure the sustainability of the programme and the sector as a whole.

The programme has constituted a very efficient springboard for the renewable energy industry in the country by stimulating interest, investment and laying the foundations for further developments. In addition to procuring large-scale renewable energy-based electricity at increasingly competitive prices, the programme has brought some added benefits to the country in the form of job creation, industrial development, community development and local ownership. Ultimately, the success of the REIPP procurement programme has enabled significant changes in the electricity supply industry by facilitating the entry of IPPs in the generation market and the development of renewable energy in the country. The programme represents a cornerstone feature of the creation of a more competitive and efficient electricity supply industry and the transition to a clean and low-carbon energy mix in South Africa.

Going forward, the development of the renewable energy industry outside government-led programmes should also be considered. The current electricity industry in South Africa and the REIPP procurement programme are structured around Eskom as the single buyer of electricity (as per the single buyer model prevailing in the country). Even though the current structure of the electricity supply industry is not particularly conducive to other procurement approaches, a space for the development of a unique business model, trading in electricity facilitating a 'willing-buyer, willing-seller' model, has emerged in the last decade. This alternative model, based on a small voluntary market for renewable energy outside of the REIPP procurement programme, has been made possible thanks to a partnership with

[8] Policy process, building on the work of Lasswell (1956), can be chronologically divided between agenda-setting, policy formulation, decision-making, implementation and evaluation (eventually leading to redesign or termination). As policy-making is meant to participate in problem solving or to the very least, a reduction in problem load, the evaluation of policies against their intended outcomes, objectives and impacts is instrumental to policy learning and ultimately problem solving.

municipal structures, allowing the connection of IPPs and industrial customers by a trading entity, Amatola Green Power. Demand for renewable energy from industrial customers (i.e. outside of the REIPP procurement programme) and competitively priced supply have enabled the development of this market on a small scale. Although this alternative model remains limited to a single company (trading entity) at this stage, it does open up the market for IPPs to sell to customers outside of the national utility and demonstrates the potential for a voluntary market, especially in partnership with local governments, to further develop renewable energy in South Africa. The Independent Market and Systems Operator Bill, which is meant to create a state entity independent from electricity generators and distributors, and serve as a buyer of electricity from generators and seller of power to customers at wholesale level, is currently before Parliament. While remaining fully-owned by government, an ISMO would contribute to levelling the playing field by eliminating the potential bias created by the current structure in which the Department of Energy procures energy and trading occurs within Eskom (Unlimited Energy, 2013). The introduction of an ISMO would open the door for customers to choose their suppliers, i.e. Eskom or an IPP, and potentially contributing to sustainable development by preferring renewable energy producers (Abrahams *et al.*, 2013). From a policy perspective, recent developments around a voluntary market call for the South African government to elaborate strategies to broaden consumer choice in electricity consumption and allow multiple electricity buyers.

Going beyond the energy sector, the development and success of the REIPP procurement programme carries important findings for other infrastructure programmes in the country. Both the private sector and government clusters working in infrastructure development,[9] have expressed interest in using the model of the REIPP procurement programme to procure other type of infrastructure projects beyond the energy sector (Munshi, 2013). This may trigger a significant shift in how the South African Government approaches public-private partnerships and open the door for more efficient, sustainable, job creating infrastructure procurement in the country.

[9] National Treasury's task team responsible for private sector financing of infrastructure, which includes personnel from the Department of Public Enterprises, the Presidential Infrastructure Co-ordinating Commission, business and labour unions, have particularly investigated this possibility.

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