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South Africa's Renewable Energy IPP Procurement Program: Success Factors and Lessons

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Cover photos: Left, Photograph taken during construction of Hopefield Wind Farm (66MW), Western Cape. Courtesy of Umoya Energy (RF) (Pty) Ltd.; right, Kalkbult. Eric Miller for Scatec.
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Finally, any errors contained in the document are solely the responsibly of the authors.

ABBREVIATIONS

BEE	Black Economic Empowerment
BBBEE	Broad-Based Black Economic Empowerment Act of 2003
COD	Commercial Operation Date
COP	Conference of Parties
CSP	Concentrated Solar Power
DA	Direct Agreement
DBSA	Development Bank of Southern Africa
DFI	Development Finance Institution
DOE	Department of Energy
EIB	European Investment Bank
FITs	Feed-in Tariffs
IA	Implementation Agreement
IFC	International Finance Corporation
IPPs	Independent Power Producers
MDB	Multilateral Development Banks
MOA	Memorandum of Agreement
MW	Megawatt
NERSA	National Energy Regulator of South Africa
OECD	Organization of Economic Cooperation and Development
OPIC	Overseas Private Investment Corporation
PPA	Power Purchase Agreement
PPP	Public-Private Partnerships
PPPFA	Preferential Procurement Policy Framework Act
PV	Photovoltaic
REFIT	Renewable Energy Feed-in Tariffs
REIPPPP	Renewable Energy Independent Power Project Procurement Program
RFP	Request for Proposals
VfM	Value for Money

Executive Summary

OVERVIEW

South Africa occupies a central position in the global debate regarding the most effective policy instruments to accelerate and sustain private investment in renewable energy. In 2009, the government began exploring feed-in tariffs (FITs) for renewable energy, but these were later rejected in favor of competitive tenders. The resulting program, now known as the Renewable Energy Independent Power Producer Procurement Program (REIPPPP), has successfully channeled substantial private sector expertise and investment into grid-connected renewable energy in South Africa at competitive prices.

To date, a total of 64 projects have been awarded to the private sector, and the first projects are already on line. Private sector investment totaling US$14 billion has been committed, and these projects will generate 3922 megawatt (MW) of renewable power. Prices have dropped over the three bidding phases with average solar photovoltaic (PV) tariffs decreasing by 68 percent and wind dropping by 42 percent, in nominal terms. Most impressively, these achievements all occurred over a two-and-a-half year period. Finally, there have been notable improvements in the economic development commitments, primarily benefiting rural communities. One investor characterized REIPPPP as "the most successful public-private partnership in Africa in the last 20 years." Important lessons can be learned for both South Africa and other emerging markets contemplating investments in renewables and other critical infrastructure investments.

THE BIDDING PROCESS AND THE RESULTS

In August 2011, an initial Request for Proposals (RFP) was issued, and a compulsory bidder's conference was held with over 300 organizations attending. By November 2011, 53 bids for 2128 MW of power generating capacity were received. Ultimately 28 preferred bidders were selected offering 1416 MW for a total investment of close to US$6 billion. Major contractual agreements were signed on November 5, 2012, with most projects reaching full financial close shortly thereafter. Construction on all of these projects has commenced with the first project coming on line in November 2013.

A second round of bidding was announced in November 2011. The total amount of power to be acquired was reduced, and other changes were made to tighten the procurement process and increase competition. Seventy-nine bids for 3233 MW were received in March 2012, and19 bids were ultimately selected. Prices were more competitive, and bidders also offered better local content terms. Implementation, power purchase and direct agreements were signed for all 19 projects in May 2013.

A third round of bidding commenced in May 2013, and again, the total capacity offered was restricted. In August 2013, 93 bids were received totaling 6023 MW. Seventeen preferred bidders were notified in October 2013 totaling 1456 MW. Prices fell further in round three. Local content again increased, and financial closure was expected in July 2014. A fourth round of bidding was set to commence in August 2014.

The first three REIPPPP bid rounds attracted a wide variety of domestic and international project developers, sponsors and equity shareholders. The 64 successful projects involved over a 100 different shareholder entities, 46 of these in more than one project. Banks, insurers, DFI's and even international utilities have all participated in the program. The most common financing structure has been project finance, although about a third of the projects in the third round used corporate financing arrangements. The majority of debt funding has been from commercial banks (ZAR 57 bn) with the balance from Development Finance Institutions (DFIs) (ZAR 27.8 bn), and pension and insurance funds (ZAR 4.7 bn). Eighty-six percent of debt has been raised from within South Africa, and debt tenors typically extend 15 to 17 years from Commercial Date of Operation (COD). Spreads over JIBAR are between 350 and 400 basis points.

KEY SUCCESS FACTORS AND CHALLENGES

REIPPPP's success factors, shortcomings and risks can be organized under three general headings: 1) program management factors; 2) program design factors; and 3) market factors.

In terms of program management factors, the largely ad hoc institutional status of the Department of Energy (DOE) Independent Power Producer (IPP) unit allowed an approach that emphasized problem solving, rather than enforcement of administrative arrangements, and did not undermine quality or transparency. The DOE IPP management team and the team leader had extensive experience, PPP expertise, and credibility with both public and private sector stakeholders. This team was also able to overcome some of the mistrust of private business that sometimes restricts the public-private dialogue in South Africa and secured resources to implement a quality program. These resources were used to appoint experienced advisors who were able to transfer international best practice into the South Africa context. Despite these successes, the ad-hoc status of the DOE IPP unit poses some risks. For this procurement process to be sustainable, institutional capability will need to be built within a formal institution, preferably a future independent system and market operator.

The initial design of REIPPPP was built to some extent on the lessons of an earlier, unsuccessful effort that used feed-in tariffs and has evolved over the three rounds of bidding. REIPPPP offered a quick way to roll out new generating capacity, and the size and structure of the bidding process meant that there would be multiple bid winners, an important incentive for the private sector to participate. REIPPP also represented opportunities for developers to make reasonable profits due to the link to the "REFIT-like" tariff caps in Round 1. The shift to competitive tendering subsequently helped tariffs come down sharply over the next two rounds. The rolling series of bidding with substantial capacity allocations also helped build confidence in the program. Certain exemptions from some of the national PPP regulations, and the provisions of the Preferential Procurement Policy Framework Act also assisted in fast-tracking the program, without negatively impacting transparency or quality. Furthermore, the requirement that bids be fully underwritten with debt, as well as equity, effectively eliminated the tendency of competitive tenders to incentivize under-bidding (or "low-balling") to win contracts. While some of the program's economic development requirements have been controversial, they did generate critical political support for REIPPPP.

There were also some design shortcomings and the size and readiness of the local renewable energy market were initially overestimated. This resulted in limited competition in Round 1, with bids close to the price caps that were specified in the tender. Some REIPPPP critics also argue that the program's significant upfront administrative requirements and high bid costs have contributed to higher prices than in other countries, like Brazil, and also serve as a bias against Small and Medium Scale Entrepreneurs (SMEs). While the latter critique may have some merit, it should be noted that bid costs were nevertheless tiny in relation to overall project values.

In terms of important market factors impacting the program, the global slow-down in OECD renewable energy markets meant that REIPPPP was able to attract considerable attention from the international private sector. REIPPPP also benefited South Africa's sophisticated capital market, which offered long-term project finance. The array of sophisticated advisory services was also critical to the design and management of the REIPPPP program.

GLOBAL LESSONS LEARNED

The South African experience suggests several key lessons for successful renewable energy programs in other emerging markets. For example, it's evident that private sponsors and financiers are more than willing to invest in renewable energy if the procurement process is well designed and transparent, transactions have reasonable levels of profitability, and key risks are mitigated by government. Renewable energy costs are falling and technologies such as wind turbines are becoming competitive with alternatives. Furthermore, renewable energy procurement programs have the potential to leverage local social and economic development. REIPPPP also highlights the need for effective program champions with the credibility to interact convincingly with senior government officials, effectively explain the program to stakeholders, and communicate and negotiate with the private sector. Finally, REIPPPP demonstrates that whether an FIT or competitive tender is chosen, private sector project developers need a clear procurement framework within which to invest.

Introduction

As grid-connected renewable energy independent power projects (IPPs) become more prevalent around the globe, debates have intensified on the most effective policy instruments to accelerate and sustain investment by the private sector into these electricity-generating technologies. Feed-in tariffs (FITs) have been the most widely used government support mechanism for accelerating private investment in renewable energy generation. FITs are meant to reflect the costs of producing particular kinds of energy, as predetermined by government analysis (rather than set as a result of competitive bidding). They are used in offers of long-term supply contracts to renewable energy producers. However, competitive tenders or auctions have also emerged in many jurisdictions as acceptable techniques, especially in emerging economies. Tenders have the potential to offer lower prices, while still providing adequate incentives for market entry by renewable energy suppliers.

South Africa now occupies a central position in this debate. In 2009, the government began exploring FITs for renewable energy, but they were rejected in 2011 in favor of competitive tenders. The initial outcomes of the program, now known as the Renewable Energy Independent Power Procurement Program (REIPPPP), have been encouraging. Beginning with its first bid round in August 2011, REIPPPP has attracted a multitude of international and local private project developers and investors who have channeled large amounts of private expertise and investment into grid-connected renewable energy in South Africa at competitive prices. In its second and third bid rounds, the program has also fostered competition with consequent, and impressive, price reductions. And, it has achieved results in record time: despite some delays, in less than three years three successful bidding rounds have been held, evaluations have been timely and transparent, all projects in bid windows one and two have reached financial close, and many are under construction or are already in operation.

In total, REIPPPP has generated 64 new renewable energy IPPs, of different sizes at different sites. US$14 billion in investment has been committed for the construction of 3922 MW[1] of capacity in technologies like grid-connected wind, PV and concentred solar power, as well as smaller amounts of hydro, landfill gas and biomass energy. Since 2012, South Africa has ranked among the top ten countries globally in terms of renewable energy IPP investments.In less than three years, South Africa has signed up more investment for more independent power generation than has been achieved across the entire African continent over the past 20 years.

This paper explores the South African experience of introducing grid-connected renewable energy by seeking answers to a number of key questions:

1. Why and how did South Africa move from feed-in tariffs to competitive tenders for grid-connected renewable energy?
2. How did the government design and manage the program? What were the distinctive features of these competitive tenders, and how were the bids evaluated?
3. What were the investment and price outcomes of the different bid rounds?
4. Who were the key private sector actors in the various deals? What kinds of financing institutions were involved? Who were the successful sponsors, equipment providers, and engineering, procurement, and construction (EPC) contractors?
5. What were the impacts and trade-offs between prices and economic development outcomes (e.g., local industrial development and employment creation)?
6. What were the key success factors, shortcomings and risks associated with the program?
7. What lessons can the South African program offer to other developing countries?

[1] This is the total after financial close of bid windows 1 and 2. The RFP total is slightly lower at 3915 MW

From Feed-In Tariffs To Competitive Tenders

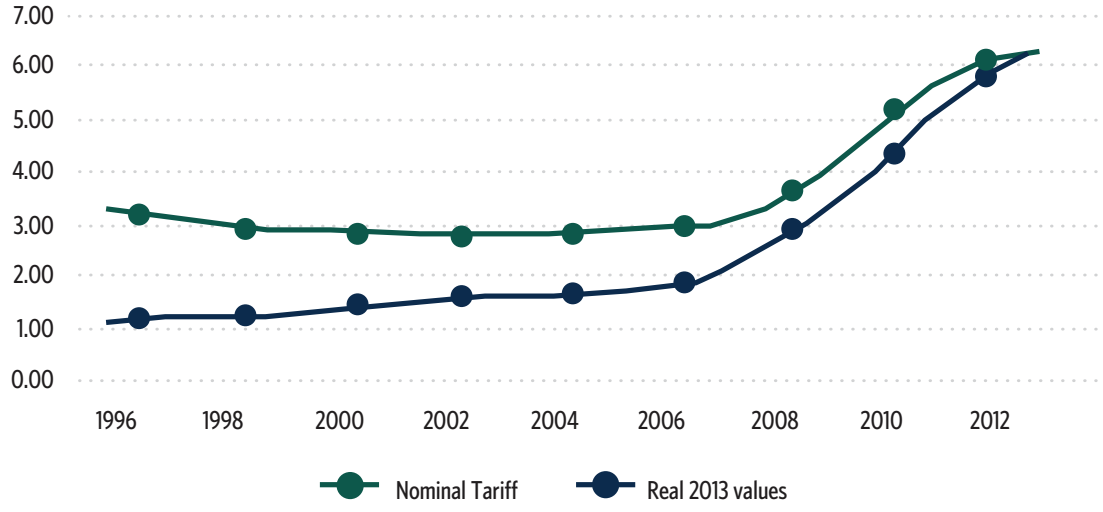
1.1 SOUTH AFRICA'S ELECTRICITY SUPPLY SYSTEM

The South African power system is characterized by large power stations that are concentrated in the interior of the country near the mines and industries of Gauteng province, and long transmission lines down to coastal areas. Coal supplies approximately 70 percent of the country's primary energy and more than 90 percent of its electricity. A publicly owned national power utility, Eskom, generates 96 percent of the country's electricity, owns and controls the national high-voltage transmission grid, and distributes approximately 60 percent of electricity directly to customers. Local authorities buy bulk from Eskom and distribute the balance. Direct electricity sales to mines and industry account for more than 40 percent of Eskom's distribution business (see Appendix 1 for a list of Eskom's major power stations).

In the 1970s, Eskom overestimated demand growth and embarked on a massive investment program, which continued into the1980s, when it became apparent that the utility would have significant overcapacity. By the end of the 1990s, the country's electricity prices ranked among the cheapest in the world. In 2007, Eskom's average electricity sales price was as low as 2.5 USc/kWh. In effect, the utility had paid off the capital costs for much of its existing capacity, and customer prices were close to short-run marginal costs.

However, by 2004, already, it became clear that power reserve margins were dropping sharply and would turn negative in a few years without Eskom interventions on both the demand and supply sides. Eskom initiated a US$40 billion power plant construction program, and a few years later the National Energy Regulator of South Africa (NERSA) began allowing sharp upward adjustments in electricity tariffs in an effort to sustain Eskom's financial viability.[2] Figure 1 shows how electricity prices have risen in nominal and real terms. Above inflation increases have been agreed by the regulator for the next 5 years, causing concern among Eskom's customers.

Figure 1: Average Nominal and Real Eskom Electricity Prices (USc/kWh) (Exchange Rate ZAR10/ USD)



Source: Constructed by the authors from data extracted from Eskom Annual Reports and StatsSA.
Note: Eskom average sales prices include transmission and distribution costs.

[2] Eskom is currently building two massive new coal-fired plants – Medupi and Kusile – each 4800 MW, as well as a new 1300 MW pumped storage scheme, Ingula. At the same time, it has commenced procurement of its first renewable energy power: a 100 MW wind farm, Sere, and a 100 MW concentrated solar plant. The latter two power projects have been funded mainly by World Bank and African Development Bank loans.

1.2 ELECTRICITY PLANNING AND PREVIOUS ATTEMPTS TO INTRODUCE IPPS

The post-Apartheid South African Government no longer leaves power planning exclusively to Eskom. The formal planning system now mandates the Department of Energy to produce an electricity plan (Integrated Resource Plan – IRP). Based on this plan, the Minister of Energy issues periodic determinations regarding how much new power generation is needed, and from which sources. NERSA can only licence new capacity within the bounds set by these ministerial determinations. The most recent IRP is for the period 2010-30 and was updated in 2013. A number of different scenarios or test cases was included (Appendix 2 presents the core model output).

The government recognizes that IPPs should be allowed to enter the market to enhance the country's power generating capacity.[3] Following the publication of the Energy Policy White Paper in 1998, a 70:30 spilt between Eskom and the private sector was accepted by the Cabinet, and work commenced on the design of a competitive wholesale power exchange.However, with looming Eskom power shortages, the prospective wholesale market was abandoned in 2004 in favour of the existing single-buyer model with Eskom being the off-taker. IPPs were still expected to play a significant role in power generation, but the policy and regulatory framework for IPPs was not immediately put in place and procurement programs run by Eskom for cogeneration and base-load IPPs were mostly unsuccessful. No IPP contracts were signed except for a handful of short-term power purchase agreements with industrial generators, which amounted to less than 400 MW.

1.3 RENEWABLE ENERGY POLICY

South Africa's system for energy planning system now also requires that renewable energy play a significant role in the nation's power generation mix. For the first time, the IRP 2010-30 incorporated a carbon emissions cap and included renewable energy options, with 17.8 GW of solar and wind energy capacity planned by 2030 (Appendix 2). More than most countries, South Africa relies heavily on coal and also has a highly energy-intensive economy. These factors result in South Africa's carbon emissions (on a per capita and GDP basis) being disproportionately high (although, in total, they amount to little over one percent of global emissions). Policymakers have been mindful of risks that these emission levels might pose to the economy's future international competitiveness. They are also aware that the country has considerable potential for some types of renewable energy generation.[4]

The government began setting renewable energy targets in 2003, with the publication of a Renewable Energy Policy White Paper that envisioned reaching 10,000 GWh of renewable energy generation by 2013. For years, very little was done to achieve this target, and there was a good deal of confusion regarding what this target actually meant: was it a cumulative or annual target? Did it include renewable energy services other than electricity? The Department of Energy eventually clarified that the target would be met by a combination of bagasse (59 percent), landfill gas (6 percent), hydro (10 percent), solar water heaters (13 percent), other biomass (1 percent), and only 1 percent wind (and intriguingly, no PV or concentrated solar power). Even these modest targets were not met by 2013.

However, while the official renewable energy policy has not been very effective in applying practical implementation strategies, policies to mitigate climate change have had a much more profound impact. In several respects, this is surprising because as a non-Annex 1

[3] In South Africa, IPPs are generally recognized as privately financed, Greenfield generation plants, supported by non-recourse or limited recourse loans, and backed by long-term power purchase agreements (PPA) signed with Eskom, the country's "single buyer" of electricity.

[4] South Africa has one of the highest potential solar energy regimes in the world with average daily direct normal radiation in excess of 7 KWh/m2 (Fluri et al., 2009). The most favorable areas are in the Northern Cape, at some distance from the main metropolitan areas. South Africa also has reasonable wind energy resources with average wind speeds above 7 m/s in some coastal and escarpment regions. The country is less endowed with hydro and biomass resources. Average rainfall across the country is 450 mm per annum compared to a global average of 860 mm). There are relatively few large rivers, and the limited potential for large dams and associated hydroelectric schemes have mostly already been exploited. There remains some potential for small hydro along the escarpment.

country under the Kyoto Protocol, South Africa does not face any commitments to reduce greenhouse gas emissions.[5]Nevertheless, the Department of Environmental Affairs commissioned research work on Long- Term Mitigation Strategies. These strategies provided the basis for President Zuma to make a pledge at the Copenhagen Conference of Parties (COP) in 2009 that South Africa would reduce its CO2 emissions 34 percent below a business-as-usual scenario by 2020, and below 42 percent by 2025, provided the international community supported South Africa with financial aid and the transfer of appropriate technology. The peak, plateau, and decline scenarios for carbon emissions subsequently informed the development of the IRP 2010-2030. The power sector in South Africa contributes roughly half of the country's carbon emissions, and an effective emissions cap was set at approximately 275 Mt/annum CO2 equivalent. A subsequent National Climate Change Response White Paper, published in 2011, provided a wider band for emission caps, but maintained the peak, plateau and decline trajectories. At the COP17 meeting in Durban in 2011, public and private sector stakeholder representatives agreed to 12 "commitments" aimed at achieving the government's goal of creating 300,000 new jobs in the "green economy" of South Africa by 2020.

1.4 FROM REFIT TO REIPPPP

South Africa's voluntary pledge in Copenhagen to reduce its carbon emissions from a business-as-usual scenario was the catalyst for new procurement strategies for renewable energy. To expand renewable energy supply, South Africa first explored the option of renewable energy feed-in tariffs (REFITs). A REFIT policy was approved in 2009 by NERSA. Tariffs were designed to cover generation costs plus a real after tax return on equity of 17 percent and would be fully indexed for inflation (NERSA 2009). Initial published feed-in tariffs were generally regarded as generous by developers – 15.6 US c/kWh for wind, 26 US c/kWh for concentrated solar (troughs, with 6 hours' storage), and 49 US c/kWh for photovoltaic.[6] But considerable uncertainty about the nature of the procurement and licensing process remained. The legality of feed-in tariffs within South Africa's public procurement framework was unclear, as was Eskom's intention to fully support the REFIT program by allowing timely finalization of power purchase agreements and interconnection agreements.

In March 2011, NERSA introduced a new level of uncertainty with a surprise release of a consultation paper calling for lower feed-in tariffs, arguing that a number of parameters—such as exchange rates and the cost of debt—had changed. The new tariffs were 25 percent lower for wind, 13 percent lower for concentrated solar, and 41 percent lower for photovoltaic (see Table 1). Moreover, the capital component of the tariffs would no longer be fully indexed for inflation. Importantly, in its revised financial assumptions, NERSA did not change the required real return for equity investors of 17 percent (NERSA 2011).

More policy and regulatory uncertainty was to come. Already concerned that NERSA's FITs were still too high, the Department of Energy and National Treasury commissioned a legal opinion that concluded that feed-in tariffs amounted to non-competitive procurement and were therefore prohibited by the government's public finance and procurement regulations. The Department of Energy and National Treasury then took the lead on a reconsideration of the government's approach. The fundamental goal of achieving large-scale renewable energy projects with private developers and financiers remained the same. However, the structure of the transactions, including the feed-in tariffs, was to change significantly.

[5] The goal of the Kyoto Protocol is to limit emissions of greenhouse gases (GHGs). According to the treaty, in 2012, Annex I Parties who have ratified the treaty must have fulfilled their obligations regarding GHG emission limitations established for the Kyoto Protocol's first commitment period (2008–2012). These emission limitation commitments are listed in Annex B of the Protocol. Non-Annex 1 countries, like South Africa, are not obligated by these caps.

[6] These values are calculated at the exchange rate at the time of ZAR8/USD.

Table 1: REFIT and REIPPPP Prices

	REFIT (ZAR / kWh)		REIPPPP (ZAR/kWh)		REIPPPP (US c/kWh)
Technology	2009 Tariff	2011 Tariff	Bid Cap	Round 1	Round 1
Wind	1.25	0.94	1.15	1.14	14.3
Photovoltaic	3.94	2.31	2.85	2.76	34.5
Concentrated solar trough with storage	3.14	1.84	2.85	2.69	33.6

Source: Constructed by authors from Department of Energy sources.
Note: 8 ZAR/USD.

A series of informal consultations were held with developers, lawyers and financial institutions throughout the first half of 2011. These meetings proved to be extremely important in terms of allaying market concerns resulting from the earlier REFIT process and providing informal feedback from the private sector on design, legal, and technology issues.

In August 2011, the DOE announced that a competitive bidding process for renewable energy would be launched, known as the Renewable Energy Independent Power Procurement Program (REIPPP). Subsequently, NERSA officially terminated the REFITs. Not a single megawatt of power had been signed in the two years since the launch of the REFIT program as a practical procurement process was never implemented, and the required contracts were never negotiated or signed. The abandonment of feed-in tariffs was met with dismay by a number of renewable energy project developers that had secured sites and initiated resource measurements and environmental impact assessments. But, it was these early developers who would later benefit from the first round of competitive bidding under REIPPPP.

Government Design and Management of the REIPPPP Tender Process

2.1 INSTITUTIONAL SETTING

REIPPPP was implemented against an historical background of institutional shortcomings in the country's energy sector. Previous efforts to contract IPPs had been left to Eskom, based on instructions from government.[7] But all of these efforts failed, perhaps because of a lack of capacity or (according to some critics) because of a fundamental lack of incentives for Eskom to weaken its monopoly on power generation. REIPPP was different because the Department of Energy (DOE) took control of the program. But DOE also recognized that, like Eskom, it had little institutional capacity to run a sophisticated, multi-project, multibillion-dollar international competitive bidding process for renewable energy. As a consequence, DOE sought the assistance of the National Treasury's Public-Private Partnership (PPP) Unit to manage the process. A small team of technical staff from DOE and the PPP Unit established a project office, known as the DOE IPP unit, which functioned effectively outside of the formal departmental structure of national government to act as a facilitator for the REIPPPP process.

2.2 THE REIPPPP MANAGEMENT TEAM

The REIPPPP team was led by a senior manager from the National Treasury PPP Unit who had worked in there since its creation in 2000, had helped establish Treasury's rigorous PPP project appraisal framework, and had been involved with DOE's efforts to promote IPPs as early as 2007. Other legal and technical experts were also brought on board and formed a small, tightknit team, which was viewed favorably by both the public and private sectors as a professional unit with a track record of considerable expertise in closing PPP contracts and a reputation as problem solvers and facilitators rather than regulators. This kind of credibility allowed the unit to act effectively as a champion of the REIPPPP process.

2.3 MANAGEMENT STYLE

Largely because the team was familiar with private sector infrastructure projects, as well as most of the bankers, lawyers, and consultants involved in such projects in South Africa, the unit did not start out with the level of mistrust of private business that sometimes characterizes other government agencies in South Africa. Dialogue with private sector counterparts on key REIPPPP design and implementation issues began almost immediately and continued throughout the process. The program was managed from the outset in a fashion that was tailored toward generating enthusiastic participation by private sector players. High standards were set and maintained throughout the bidding process, including security arrangements and transparent procurement procedures. Documentation was extensive, high quality, and readily available on a specially designed program website. Another feature of the team's management style that impressed many private players was the effort made to meet most of the program's announced deadlines. The deadline for the Round 1 financial close slipped a few months as the government finalized financial security arrangements, but other schedule delays were minor. This was a dramatic difference from virtually all of the earlier IPP programs in the sector, and was a clear signal to many operators, investors, and advisors that this program was focused on results.

A final, very important aspect of the program's management style involved the extensive use of private domestic and international advisers to design and help manage the program, review bids, and incorporate lessons learned into the program as it progressed through the bid rounds (Box 1).

[7] One exception was an earlier effort by the Department of Energy to procure open-cycle, diesel-fired turbines.

Box 1: REIPPPP Evaluation Consultants

INTERNATIONAL REVIEWERS

Legal: Linklaters (UK)

Technical: Tony Wheeler Consulting (UK)

Governance: Ernst & Young

PROJECT MANAGEMENT

SPP Project Solutions

LEGAL EVALUATION

Bowman Gilfillan

Edward Nathan Sonnebergs (ENSafrica)

Ledwaba Mazwai

Webber Wentzel

TECHNICAL EVALUATION

Mott MacDonald

FINANCIAL EVALUATION

Ernst & Young (EY)

PWC

Source: Constructed by authors from DOE presentation.

2.4 PROGRAM RESOURCES

Key factors in having access to such high quality private advisory assistance was the availability of financial resources to pay these experts, as well as offices, a website, various databases, and one of the most sophisticated, complicated bidding processes ever seen in Africa. Funding for the program was originally made available pursuant to a memorandum of agreement (MOA) signed by DOE, National Treasury and the Development Bank of Southern Africa (DBSA). The latter was to provide a share of senior debt on the projects and make available R 80 million for consultants, a project office, and capacity building. In addition, technical assistance funding was made available by various bi-lateral donor agencies, including those representing Denmark, Germany, Spain and the UK. The World Bank had also previously facilitated a US$6 million grant from the Global Environment Facility (GEF) for advisory services under the Renewable Energy Market Transformation Project.

By the end of 2010, a team of consultants was on board and program design was underway. When it became clear that the REFIT process could not proceed, the external donors advised on REIPPPP's tender process after reviewing international tender processes in India, Brazil, Germany, France, Spain and elsewhere.

In 2011, the National Treasury made R100 million available, and some of this was used to repay the DBSA (although the DBSA still acts as the payment agent for REIPPPP). The National Treasury money saw the program through the first round and part of the second. Subsequent to that, the program has relied on bidder registration fees and fees paid by successful IPP project companies – on the effective date of the Implementation Agreements, successful project companies must pay a project development fee of one percent of total project costs to a

Project Development Fund for Renewable Energy projects managed by DOE. The fund covers current and future costs associated with DOE procurement of renewable energy and oversight of the program. These funding arrangements have helped the program remain off the formal government budget in subsequent bidding rounds.

2.5 TENDER DESIGN AND BID PROCESS

On August 3, 2011 a Request for Proposals was issued, and the next month a compulsory bidder's conference was held to address questions on bid requirements, documentation, power purchase agreements, etc. Some 300 organizations attended this conference. The REIPPPP program envisioned the procurement of 3,625 MW of power over a maximum of five tender rounds. Another 100 MW was reserved for small projects below 5 MW that wereprocured in a separate small projects IPP program. Caps were set on the total capacity to be procured for individual technologies – the largest allocations were for wind and photovoltaics, with smaller amounts for concentrated solar, biomass, biogas, landfill gas, and hydro (see Table 2 below). The rationale for these caps was to limit the supply to be bid out and therefore increase the level of competition among the different technologies and potential bidders.

The tenders for different technologies were held simultaneously. Interested parties could bid for more than one project and more than one technology. Projects had to be larger than 1 MW, and an upper limit was set on bids for different technologies—for example, 75 MW for a photovoltaic project, 100 MW for a concentrated solar project and 140 MW for a wind project. Caps were also set on the price for each technology (at levels not dissimilar to NERSA's 2009 REFITs). Bids were due within three months of the release of the RFP, and financial close was to take place within six months after the announcement of preferred bidders.

The RPF was divided into three sections detailing: 1) general requirements, 2) qualification criteria, and 3) evaluation criteria. The documents also included a standard Power Purchase Agreement (PPA), an Implementation Agreement (IA) and Direct Agreements (DA). The PPA was to be signed by the IPP and Eskom, the off-taker. PPAs specified that the transactions should be denominated in South Africa Rand and that contracts would have 20-year tenures from COD. The IAs were to be signed by the IPPs and the Department of Energy (DOE) and effectively provided a sovereign guarantee of payment to the IPPs, by requiring DOE to make good on these payments in the event of an Eskom default. The IA also placed obligations on the IPP to deliver economic development targets. The DAs provided step-in rights for lenders in the event of default. The PPA, IA and DA were non-negotiable contracts and were developed after an extensive review of global best practices and consultations with numerous public and private sector actors. Despite some bidder reservations regarding the lack of flexibility to negotiate the terms of the various agreements, the overall thoroughness and quality of the standard documents seemed to satisfy most of the bidders participating in the three rounds.

Bids were required to contain information on the project structure, legal qualifications, land, environmental, financial, technical and economic development qualifications. Bidders had to submit bank letters indicating that financing was locked-in – highly unusual and basically a way to outsource due diligence to the banks. Effectively this meant that lenders took on a higher share of project development risk and this arrangement dealt with the biggest problem with auctions – the "low-balling" that results in deals not closing.

The developers were expected to identify the sites and pay for early development costs at their own risk. A registration fee of ZAR15,000 (US$1,875) was due at the outset of the program. Bid bonds or guarantees had to be posted, equivalent to ZAR100,000 (US$12,500) per megawatt of nameplate capacity of the proposed facilities, and the amount was doubled once preferred bidder status was announced.[8] The guarantees are to be released once the projects come on line or if the bidder was unsuccessful after the RFP evaluation stage.

[8] An exchange rate of ZAR8/USD is used in the build-up to the REIPPPP and for Round 1 when the first agreements were signed. For Rounds 2 and 3, the exchange rate at the time of signing agreements is used to calculate project prices and investment values.

Project selection was based on a 70/30 split between price and economic development considerations. REIPPPP was able to adjust the normal government 90/10 split favoring price considerations in the procurement selection process. An exemption was obtained from the Public Preferential Procurement Framework Act in order to maximize economic development objectives.

A regulatory review determined that the REIPPPP would not be subject to National Treasury Regulation 16 for evaluating and approving public-private partnerships (PPPs). The PPP regulations reflect national legislation and are consistent with best practice in OECD countries. By the same token, they require a complicated, time-consuming, and expensive review process that must be implemented by expert consultants using specialized analytical techniques (like "public sector comparators") to confirm value-for-money (VFM), and must include wide ranging consultation with stakeholders, as well as frequent interaction with National Treasury's PPP Unit. The national PPP regulations call for 24 elaborate preparation steps, as well as four "opinions" on the process issued by National Treasury at different stages of preparation, based on inputs from National Treasury's PPP Unit. The process is required regardless of the size or nature of the PPP project, and has been characterized by some private sector operators and investors as cumbersome and slow.

This PPP regulatory process was not applicable to the REIPPPP because Eskom, which signs the power purchase agreements with private operators, is considered a state-owned enterprise rather than a government agency, and therefore its purchase of power is not subject to National Treasury's PPP regulations (even though the procurement program was formally the responsibility of DOE). In order for the DOE to demonstrate value-for-money, and to fulfill the requirements of Clause 9 of the New Generation Regulations, the second bid window requested bidders voluntarily to submit their own arguments documenting VFM.

The timing of the initial round of bidding was also advantageous for the program. The renewable energy sector is highly competitive given the diversity of sources, the modular nature of most of the technologies, and the number of project developers. Manufacturing of components for most renewable energy technologies involves relatively mature, existing technologies and established industries. But, for several years these industries have been experiencing global over-capacity and intense competition that has resulted in very thin profit margins, if profits are generated at all. As a result, the industry continues to experience consolidation, the emergence of increasingly vertically integrated supply chains, and the steady movement of manufacturing firms into project development. Furthermore, renewable energy markets were in decline in Europe, and developers were looking for new opportunities in emerging markets. All of this led to intense interest on the part of the global renewable energy industry in REIPPPP and growing levels of competition as the bidding progressed.

Despite favorable market dynamics, there was still some concern among prospective bidders at the start of the bidding process. However, the quality and detail of the bid documentation, the clarity provided during the bidder's conference, as well as the on-going dialogue during the first half of 2011, seemed to alleviate some of the nervousness that had developed over the previous two years. Investors and operators also particularly liked the structure of the pricing, as the REIPPPP tariff caps were at levels similar to the earlier feed-in tariffs.

The first round of bids was received in late 2011 and the DOE IPP unit used a group of international and local experts to assess the bids. Many of these advisors had been involved in the initial design process. Given the scale of the investments, the competition anticipated, and the reputational risk identified, security and confidentiality surrounding the evaluation process was extremely tight with 24-hour voice and CCTV monitoring of the venue. Approximately 130 to 150 local and international advisors were used to develop the RFP and evaluate the bids in the first round, at a total cost of approximately US$10 million.

2.6 BID EVALUATION

The bid evaluation involved a two-step process. First, bidders had to satisfy certain minimum threshold requirements in six areas: environment, land, commercial and legal, economic development, financial, and technical. For example, the environmental review examined approvals while the land review looked at tenure, lease registration, and proof of land use applications. Commercial considerations included the project structure and the bidders' acceptance of the Power Purchase Agreement. The financial review included standard templates used for data collection that were linked to a financial model used by the evaluators. Technical specifications were set for each of the technologies. For example, wind developers were required to provide 12 months of wind data for the designated site and an independently verified generation forecast. The economic development requirements, in particular, were complex and generated some confusion among bidders (see a detailed discussion of these requirements in Section 5).

Bids that satisfied the threshold requirements then proceeded to the second step of evaluation, where bid prices counted for 70 percent of the total score, with the remaining 30 percent of the score given to a composite score covering job creation, local content, ownership, management control, preferential procurement, enterprise development and socioeconomic development. Bidders were asked to provide two prices: one fully indexed for inflation and the other partially indexed, with the bidders initially allowed to determine the proportion that would be indexed. In subsequent rounds, floors and caps were instituted for the proportion that could be indexed. The bids were evaluated using a standard financial.

Tender Outcomes

The results of Rounds 1, 2 and 3 are summarized in Table 2 and discussed in the sections below.

Table 2: Summarized Results for REIPPPP Windows 1, 2 and 3

	Wind	PV	CSP	Hydro	Biomass	Biogas	Landfill	Total
WINDOW 1								
Capacity offered (MW)	1850	1450	200	75	12.5	12.5	25	3625
Capacity awarded (MW)	634	631.5	150	0	0	0	0	1415.5
Projects awarded	8	18	2	0	0	0	0	28
Average tariff (SAc/kWh)	114	276	269	N/A	N/A	N/A	N/A	N/A
Average tariff (USc/kWh) ZAR8/$	14.3	34.5	33.6					
Total investment (ZAR mill)	13312	23115	11365	0	0	0	0	47792
Total investment (USD mill) ZAR8/$	1664	2889	1421					5974
WINDOW 2								
Capacity offered (MW)	650	450	50	75	12.5	12.5	25	1275
Capacity awarded (MW)	562.5	417.1	50	14.3	0	0	0	1043.9
Projects awarded	7	9	1	2	0	0	0	19
Average tariff (SAc/kWh)	90	165	251	103	N/A	N/A	N/A	N/A
Average tariff (USc/kWh) ZAR7.94/$	11.3	20.8	31.6	13				
Total investment (ZAR mill)	10897	12048	4483	631	0	0	0	28059
Total investment (USD mill) ZAR7.94/$	1372	1517	565	79	0	0	0	3534
WINDOW 3								
Capacity offered (MW)	654	401	200	121	60	12	25	1473
Capacity awarded (MW)	787	435	200	0	16	0	18	1456
Projects awarded	7	6	2	0	1	0	1	17
Average tariff (SAc/kWh)	74	99	164	N/A	140	N/A	94	N/A
Average tariff (USc/kWh) ZAR9.86/R	7.5	10	16.6		14.2		9.5	N/A
Total investment (ZAR mill)	16969	8145	17949	0	1061	0	288	44413
Total investment (USD mill) ZAR9.86/R	1721	826	1820		108		29	4504
TOTALS								
Capacity awarded (MW)	1984	1484	400	14	16	0	18	3915
Projects awarded	32	23	5	2	1	0	1	64
Total investment (ZAR mill)	40590	42130	33797	631	1061	0	288	120263
Total investment (USD mill)	4683	5085	3806	79	108	0	29	14011

Source: Constructed by the authors from DOE presentations and data provided by the DOE IPP Unit.

Note 1: ZAR/USD conversions calculated at date agreements were signed in each window.

Note 2: The above data is representative at the time of bidding. Contracted capacity and investment amounts changed slightly at the time of financial close. The investment data for bid Window 1 were provided by the DOE IPP Unit and differ slightly from data released in DOE presentations.

3.1 ROUND 1 OUTCOMES

The initial results were somewhat surprising to the DOE IPP unit. One official noted that the unit thought they might receive 12 bids and close three projects during the first round. In fact, their biggest fear going into the process was that no bids would ultimately be closed. The slow global market, tight deadline, earlier issues with REFIT, and the extensive qualification process were all factors that contributed to modest expectations by the DOE IPP unit.

Yet on November 4, 2011, a total of 53 bids for 2,128 MW of power generating capacity were received. The evaluation process took place over a four-week period and preferred bidders were announced on December 7, 2011, coinciding with the COP17 meeting in Durban. Ultimately, 28 preferred bidders were identified in the first round, offering 1,416 MW for a total investment of US$5.97 billion.[9] Eighteen projects used PV technology, with a capacity of 632 MW, while another two transactions used CSP technology, with a capacity of 150 MW. Eight projects used wind technology, totaling 634 MW. Both South African and international sponsors and lenders were involved, although most of the debt financing was sourced from South African banks, with much of the balance from Development Finance Institutions (DFI's). For the most part, conventional project financing was used. Subsequent to Round 1, a secondary market began to develop, primarily involving South African pension funds and insurance companies.

For the first round, a deadline of July 2012 was set for financial close, and a deadline of the end of 2014 for the commercial operating date. These dates were later extended. The government took longer than expected to finalize its guarantees and local banks, advisors, and other project partners were stretched to the limit with so many projects reaching closure simultaneously.

Major contractual agreements were signed on November 5, 2012, with most projects reaching full financial close within ten days after conditions precedent were met. The process of closing all the investments on the same day was used to standardize and limit foreign exchange risk, although it posed significant challenges to the banking system. Construction on all the projects in Round 1 has commenced, and the first project came on line in November 2013. Nine other projects were scheduled to begin operation during March 2014 and the remaining schemes are expected to be on line by March 2015.

Although bidders could not know for certain the total capacity that would be bid, they likely recognized that the tight deadlines and challenging threshold qualification criteria would result in less capacity being bid than was made available in Round 1. Accordingly, the prices bid were mostly unaffected by competitive limitations and only marginally below the caps specified in the request for proposals. High prices were also driven by high initial transaction costs and possible policy uncertainty. Table 1 (in Section 1, above) compares prices bid in Round 1 with the tender caps and the previous REFIT tariffs.

3.2 ROUND 2 OUTCOMES

Round 2 was announced in November 2011 and made use of the same Request for Proposals used in Round 1. However, the total amount of power to be procured was dropped to 1,275 MW in order to stimulate additional competition. By reducing the amount of power sought, the DOE IPP unit hoped to make the process more competitive. Interestingly, the price caps remained at the same level, although the new RFP stated that the government expected prices to fall and was considering lowering the price caps in the third round. The rationale was based on an analysis of worldwide prices and improvements in technology. Other changes included a ceiling for the partial indexing and stricter rules regarding pricing of local content.

[9] DOE presentations refer to investment of R5.75bn in Window 3, but the IPP unit has updated this figure.

A total of 79 bids were received in Round 2, nearly a 50 percent increase over Round 1 despite the significant drop in the capacity offered. The bids were received on March 5, 2012 and totaled 3233[10] MW. Again, a team of local and international experts was used to evaluate the tenders and again the review process was held in a secure location with 24-hour surveillance. Unlike Round 1 however, a more sophisticated system was used to record and track the bidding documents to increase security and improve efficiency. Fifty-one projects met the qualifying criteria. The preferred bidders were announced on May 21, 2012. A totalof 19 bids were selected in Round 2, including 9 solar PV projects, 7 wind projects, 2 small hydro projects and one concentrated solar project.

Wind and solar PV prices in the second round were much more competitive, falling on average by 20 percent for wind and 40 percent for PV (Table 2). The range of prices bid was also wider, with prices varying from 10.2 to 11.4 US c/kWh for wind, and from 17.6 to 22.4 US c/kWh for photovoltaic. The price for concentrated solar fell by 7 percent to 32 US c/kWh, with one preferred bidder taking up the remaining available capacity. There was little competition in small hydro, with only two qualifying bids, both at the capped price of 13 US c/kWh.

The Round 2 preferred bidders also offered better local content terms (partly in response to higher targets in the bid documents), with average local content rising from 38.4 percent to 53.4 percent for solar PV, from 27.4 percent to 48.1 percent for wind, and from 34.6 percent to 43.8 percent for concentrated solar.[11] The deadline for financial close for Round 2 was extended from the end of 2012 to May 9, 2013 when contracts were signed for all 19 projects. According to government officials, the results of Round 2 – particularly the lower prices and better local content terms – effectively saved the reputation of the program and suggested to some officials that competitive tenders might be a way to achieve significantly lower prices than FITs.

3.3 ROUND 3 OUTCOMES

The procurement documents for Round 3 were released on May 3, 2013 and were again based on those used in previous rounds, but with further refinements. The total capacity on offer was restricted to 1473 MW, with individual capacity caps for different technologies. The maximum size of individual, small hydro plants was increased from 10 MW to 40 MW. Price caps were adjusted: wind energy was dropped from 115 to 100 c/kWh, PV from 285 to 140 c/kWh, CSP's base price to 165c/kWh, and small hydro from 103 to 85 c/kWh. A later bid note scrapped price caps for both PV and Wind and increased the small hydro cap to 106 c/kWh. Biomass and landfill gas energy price caps were adjusted upwards to 140 and 94c/kWh respectively (all South African cents). Once again, bidders could offer fully indexed or partially indexed prices. The partially indexed portion could not be less than 20 percent of the price and not more than 50 percent. Bid prices were to be adjusted at financial close by the difference between the foreign exchange rates used in the financial models at the time of bid submission and the rates reflected in the spot prices at the date of financial close. Evaluation was again conducted under strict security conditions with significant efforts paid to ensuring a transparent process. All firms and individuals involved in the evaluation process had to make declarations of interest. Independent review teams scrutinized reports prepared by evaluators, and an independent governance review team reviewed the overall process.

On August 19, 2013, 93 bids were received totaling 6023 MW. Seventeen preferred bidders were notified on October 29, 2013. Their bids totaled 1456 MW and included 787 MW wind energy, 435 MW PV, 200 MW CSP, 18 MW of landfill gas, and 16 MW of biomass energy. Prices fell further in Round 3. Solar PV fell by 68 percent compared to Round 1, and wind energy by 42 percent. CSP also fell, although

[10] The DOE announced a figure of 3255 MW, but the DOE IPP Unit database records 3233 MW.

[11] This data differs from that included in some DOE public presentations and includes more accurate data calculated by the DOE IPP unit. This calculation is done by aggregating the Total Project Value for all the projects in a bid window for that specific technology and dividing it by the aggregate of the Local Content for all the projects in a bid window for that specific technology. Also important to note that the Total Project Value is the term defined by the ED team in the IA and is used as opposed to the Total Project Cost, which is the total debt and equity required to fund the project. The two terms and amounts are not the same.

Round 3 had a new tariff system (base prices were to be payable for 12 hours every day and 270 percent of the base price payable for five peak hours every day). Round 3 bid prices for CSP are thus not directly comparable with those in Rounds 1 and 2. Local content increased marginally for solar PV from 53.4 percent in Round 2 to 53.8 percent in Round 3 and for CSP from 43.8 percent to 44.3 percent. Local content for wind energy actually declined slightly from 48.1 percent in Round 2 to 46.9 percent in Round 3.

Financial close for Round 3 was set for July 30, 2014 and projects had to reach the commercial operation date (COD) within four years of the bid submission date, i.e., by the end of 2017 except for CSP projects, which were required to be operational by the end of 2018.

3.4 PLANS FOR ROUND 4

As noted above, the REIPPPP program has been implemented pursuant to the IRP 2010-30 and authorized through two ministerial determinations specifying the needed amount of new renewable power generation (3725 MW and 3200 MW). After Round 3, 2808 MW still remained to be allocated comprising 1041 MW of solar PV, 1336 MW of wind, 200 MW of solar CSP, 121 MW of small hydro and 110 MW of biomass, biogas and landfill gas. Round 4 tenders are planned for August 2014.

3.5 ROUNDS 1-3: COMPETITION AND PRICING

As already noted, Round 1 attracted 28 qualifying bids, but investors bid for fewer megawatts than were actually being offered. Bidders realized that there would be a limited number of projects that would be ready in time to meet the qualifying criteria, and thus, bids were close to the price caps. Bidders assumed that even though their price proposals were high, the lack of competition meant that it was unlikely that their bids would be rejected.

Less capacity was made available in subsequent tender rounds and competition increased dramatically, both in the number of bids and those that met and exceeded the qualification hurdles. As result, prices fell significantly – as summarized in Table 3 below.

Table 3: REIPPPP Average Bid Prices, 2011 values (SAc/kW)

	Round 1	Round 2	Round 3
Wind	114.3	89.7	65.6
Reduction from previous round		-21.5%	-26.9%
Total reduction from round 1			-42.6%
Solar PV	275.8	164.5	88.1
Reduction from previous round		-40.4%	-46.4%
Total reduction from round 1			-68.1%
Concentrated solar power	268.6	251.2	146.0*
Reduction from previous round		-6.5%	-41.9%
Reduction from previous round			-45.6%

**The price structure for CSP in Round 3 was different to Rounds 1 and 2 and included a peak tariff 270% of the base price.*
Source: Constructed by authors from Department of Energy presentations.

3 TENDER OUTCOMES

Real returns to equity in Round 1 were close to the 17 percent (in local currency) that was envisaged in determining the original feed-in tariffs. Equity returns dipped slightly in round two for wind and probably more substantially for photovoltaic. Dollar returns in the range of 12–13 percent were reported. Returns fell further in Round 3, especially for some of the corporate funded projects.

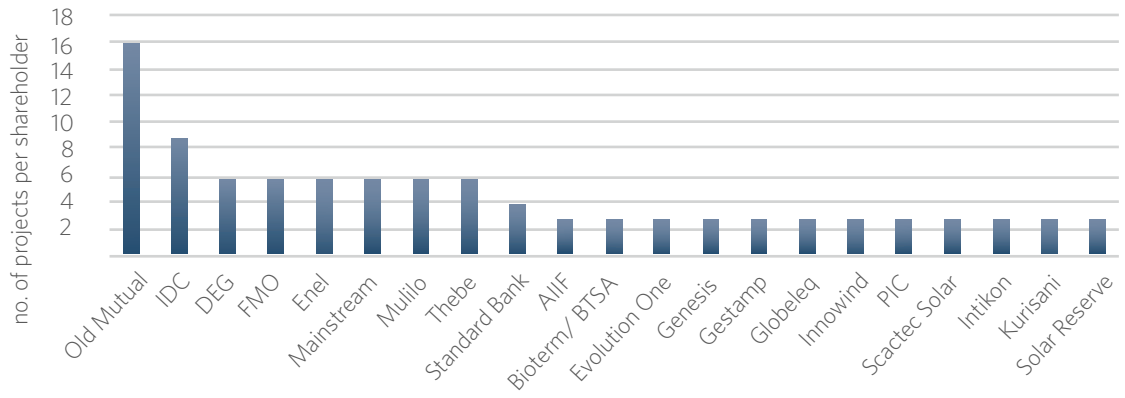
Increased competition was no doubt the main driver for prices falling in Rounds 2 and 3. But, there were other factors as well. International prices for renewable energy equipment have declined over the past few years due to a glut in manufacturing capacity, as well as ongoing innovation and economies of scale. REIPPPP was well positioned to capitalize on these global factors. Transaction costs were also lower in subsequent rounds, as many of the project sponsors and lenders became familiar with the REIPPPP tender specifications and requirements.

Key Private Sector Actors

4.1 PROJECT SPONSORS

The first three REIPPPP bid rounds attracted a wide variety of international project developers, sponsors and equity shareholders. The 64 successful projects incorporate more than 100 different shareholder entities, 46 of which participated in more than one project and 25 in three or more projects. Figure 2 shows shareholders with three or more projects. Prominent equity players have been the insurance company Old Mutual, banks such as Standard Bank of South Africa and the Industrial Development Corporation, specialist funds such as Africa Infrastructure Investment Fund, and sponsors such as Mainstream, Mulilo, and Thebe. An Italian utility, Enel Green Power, was prominent in Round 3 with 6 successful projects.

Figure 2: Prominent Shareholders in REIPPPP Windows 1, 2 & 3



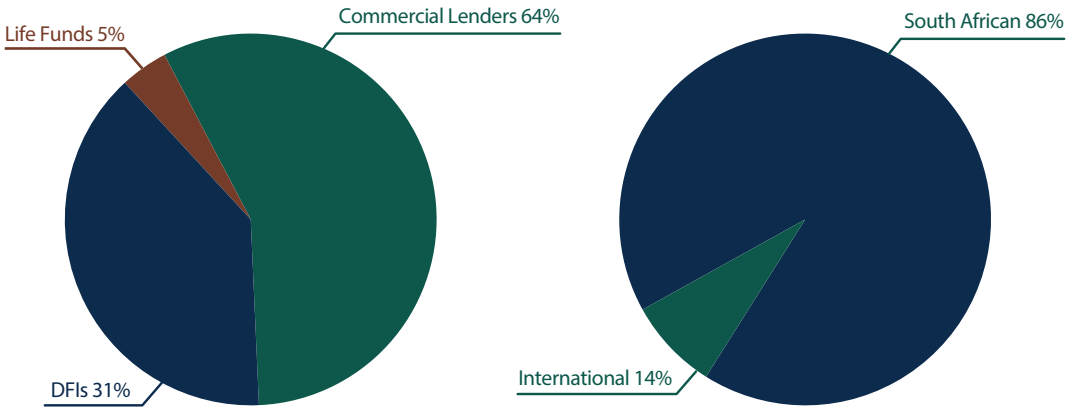
Source: Authors' calculations.

4.2 FINANCIERS

Fifty-six of the 64 projects in Rounds 1, 2, and 3 have been project financed. One project in Round 1 (Touwsrivier Solar Park) issued a corporate bond valued at ZAR 1 billion and a small hydro project (Stortemelk) was initially corporate financed, but is now being refinanced through debt. Six projects out of 17 in Round 3 were corporate financed, all by the Italian utility, Enel (which had been unsuccessful in previous rounds). Reports indicate that return on equity for the corporate funded projects in Round 3 was low. This trend toward corporate financing in REIPPPP may or may not continue, but it is likely that more international utilities will be interested in entering the South Africa renewable energy market, especially European utilities that are struggling to grow market share in their home markets.

On average, across the three rounds, approximately two-thirds of funding has been debt, with the highest proportion in Round 2 and the lowest in Round 3. A further quarter has been funded from pure equity and shareholder loans, with the remaining from corporate finance. The majority, 64 percent, of debt funding has been from commercial banks (ZAR 57 bn) with the balance from DFIs (ZAR 27.8 bn), and pension and insurance funds (ZAR 4.7 bn). Eighty-six percent of debt has been raised from within South Africa.[12]

Figure 3: Share of Debt Financing in REIPPPP Rounds 1, 2 & 3

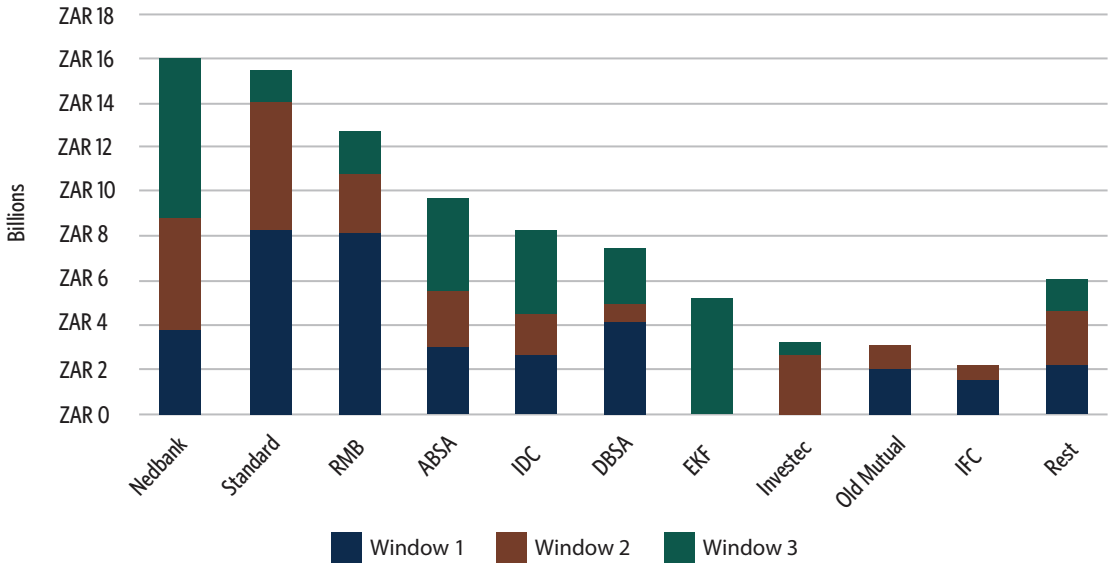


Source: Authors' calculations.

The five large South African commercial banks – Standard, Nedbank, ABSA, RMB, and Investec – have dominated REIPPPP lending. Their relative share of commercial and overall debt financing is shown in Figure 4 below. Nedbank has been involved in the most projects (23) followed by Standard (17), ABSA (14), RMB/First Rand (11) and Investec (4). These banks have all played lead debt arranging roles, although not for all deals, and in a number of projects, have also participated as co-senior lenders or as providers of subordinated mezzanine debt. Debt tenors are around 15 to17 years (from COD) and spreads over JIBAR are between 310 to 400 points (risk premium 250, liquidity 120, and statuary costs 30 points). Nedbank and ABSA, between them, were involved in the majority of projects in Round 3. Some project sponsors have complained that there has not been enough competition between the banks, and premiums have not fallen as much as would have been expected as banks became more familiar and comfortable with the REIPPPP process.

[12] The Development Bank of Southern Africa, located in Johannesburg, has been classified as local in this analysis

Figure 4: Share of Initial Debt Providers in REIPPPP



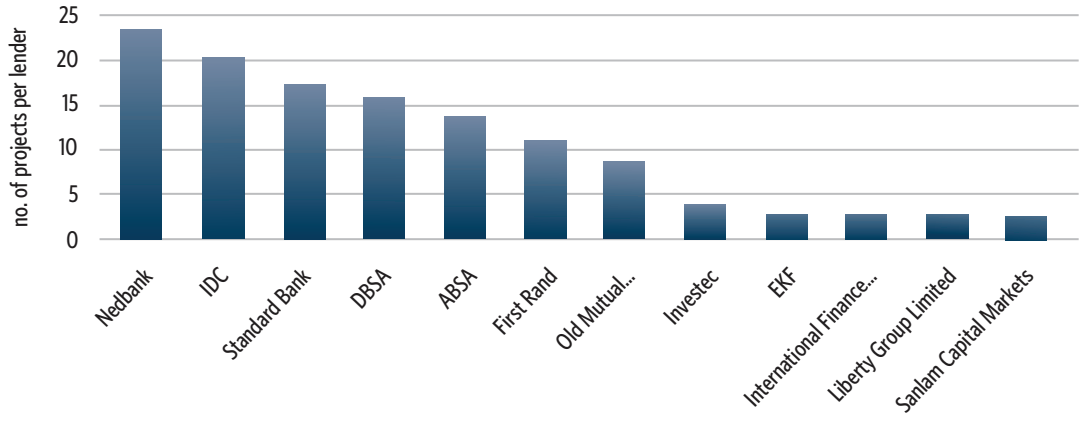
Source: Authors' calculations from the time of financial close. Some debt has subsequently been syndicated to other banks or funds.
Note: The "rest" category includes OPIC, AfDB, Liberty Group, ACWA, EIB, Sanlam, FMO, PROPARCO and Sumitomo.

Remaining local debt funding has come from the Industrial Development Corporation (IDC) and the Development Bank of Southern Africa (DBSA). The IDC participated in 20 deals and the DBSA in 16 deals, mostly in arranging vendor financing for black economic empowerment and community participation (Figure 5).

Another feature of local financing has been the involvement of insurance and pension funds as Old Mutual, Sanlam, and Liberty have all been involved. Old Mutual has also participated through its Ideas Fund, as well as its majority-owned specialist investment fund, Future Growth, and indirectly through African Clean Energy Developments (AECD), which is a joint venture between Africa Infrastructure Investment Managers (in turn a joint venture between Macquarie Africa and Old Mutual) and AFPOC (a Mauritian-registered company). It is expected that commercial banks will sell down more of their debt to these secondary capital markets and position themselves for ongoing debt exposure in future REIPPPP rounds.

International DFIs that have been involved have included the International Finance Corporation (IFC) and the Danish Export Credit agency (EKF) with three projects each, and the Netherlands Development Finance Company (FMO), the African Development Bank (AfDB), European Investment Bank (EIB) and the Overseas Private Investment Corporation (OPIC), with one project each.

Figure 5: Major Debt Providers in REIPPPP Rounds 1, 2 & 3



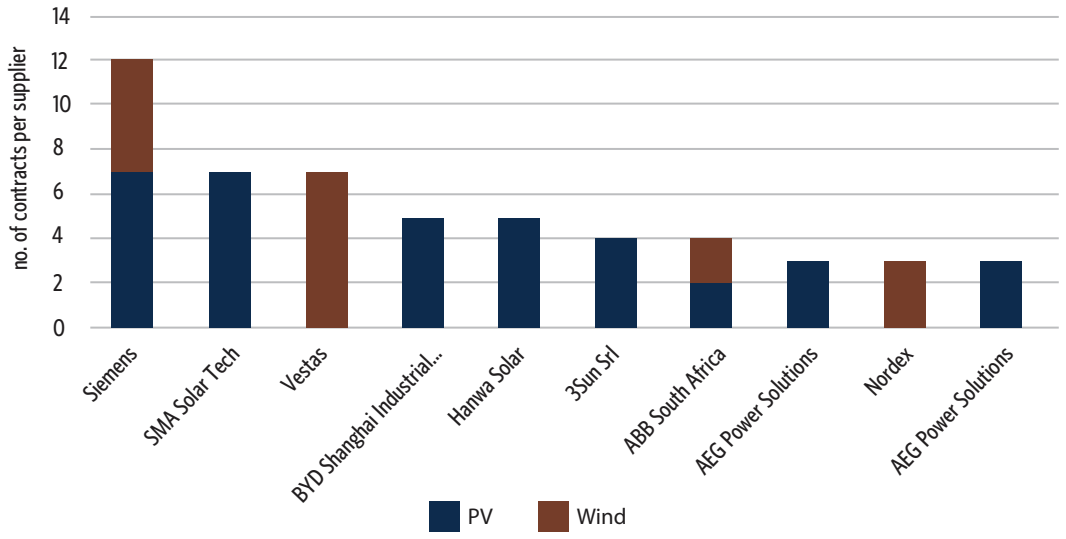
Source: Authors' calculations.

4.3 ENGINEERING, PROCUREMENT AND CONSTRUCTION (EPC) CONTRACTORS AND EQUIPMENT SUPPLIERS

Forty-nine EPC contractors have been involved in the 64 projects during the first three rounds of REIPPPP, the majority in more than one project either as the primary or secondary contractor. Prominent EPC contractors with three or more projects include Vestas (Danish), Acciona (Spanish), Consolidated Power Projects (South African), Group Five Construction (South African), Juwi Renewable Energies (German), Murray and Roberts (South Africa), Abengoa (Spanish), ACS Cobra (Spanish), Iberdrola Engineering and Construction (Spanish), Nordex Energy (Germany), Scatec (Norwegian), Suzlon (India), and Temi Energia (Italian). Many of these EPC contractors have set up subsidiary companies in South Africa.

The main suppliers of wind turbines and PV equipment are shown in Figure 6. Wind turbine suppliers have included Vestas, Siemens, Nordex, ABB, Guodian, and Suzlon, i.e., mainly European companies and a Chinese and an Indian company. Main PV suppliers have been Siemens, SMA Solar Tech, BYD Shanghai, Hanwha Solar, 3 Sun, AEG and ABB: i.e., European, Chinese, and Korean manufacturers. A local manufacturing facility, DCD Wind Towers, has been established at the Coega Industrial Development Zone in the Eastern Cape. At least five PV panel assembly plants have been established in South Africa over the last few years, and some of international suppliers have used these to achieve localization targets.

Figure 6: Main Wind and PV Equipment Suppliers in REIPPPP Rounds 1, 2 & 3



Source: Authors' calculations.

Trade-Offs Between Prices And Economic Development Outcomes

5.1 ECONOMIC DEVELOPMENT REQUIREMENTS

Among REIPPPP bidders, the most controversial aspect of the program has been its strong reliance on non-price factors in bid evaluation. These factors, organized in bid documents under the heading of "economic development requirements" are designed to incentivize bidders to promote job growth, domestic industrialization, community development, and black economic empowerment. Accounting for 30 percent of total bid value, economic and social development has played a much stronger role in the REIPPP procurement process than non-price criteria are normally required to play pursuant to the South African government's preferential procurement policy.

These requirements were controversial for several reasons: many international bidders felt that these factors were too demanding and played too substantial a role in bid valuation, while domestic participants, backed by South African trade unions, thought the requirements were not demanding enough. Bidders of all kinds seem to have been confused by some of the criteria, especially those that called for local economic development plans to be part of the bids. However, no guidance on how such plans were to be prepared or how they would be evaluated was initially provided. Also, as the process proceeded through three rounds of bidding, some of the economic development requirements became more onerous, seemingly in response to complaints by local stakeholders, rather than as a result of economic analysis or following consultation with bidders. Further changes in some of the criteria became the subject of rumor and speculation, especially between Rounds 2 and 3, making it difficult for companies to prepare their proposals given the tight time fames between bid rounds. Perhaps most important, REIPPPP's elaborate system for penalizing and rewarding contractor performance against economic development commitments begs the question of what resources will be available to carry out performance monitoring, make decisions regarding performance penalties, and resolve related disputes.

The focus of REIPPPP on local content, both de facto and de jure, has been significantly different from that required under existing frameworks like the Preferential Procurement Policy Framework Act (PPPFA), promulgated in 2000, or the Broad-Based Black Economic Empowerment (BBBEE) Act of 2003 with its Codes of Good Practice published in 2007. An exemption was granted from the PPPFA's requirement that 90 percent of the bid score be allocated to price with the remaining 10 percent allocated to compliance with preference categories (or the 80/20 split for smaller contracts). Instead, REIPPPP divides bid scoring on a 70/30 basis, with the former allocated to price and the latter to non-price "economic development" criteria.

In contrast to BBBEE, REIPPPP emphasizes black job creation over black ownership, and reclassifies enterprise and socio-economic development as local community development targets rather than BEE targets. Overall, REIPPPP targets economy-wide jobs, local content benefits, and local community development over BEE. Appendix 3 shows the extent to which REIPPPP's economic development categories serve traditional South African socio-economic objectives like BEE.

These departures from existing local content requirements suggest that government officials view REIPPPP as a program that, in the words of the first RFP, "is inherently excellent for achieving positive socio-economic outcomes" (RSA, 3 Aug. 2011, p. 11). Government officials clearly see a potential to boost local manufacturing in a sector that is completely underdeveloped in the country. Because of the distributed nature of renewable energy generation, project sites offer an unusually intense business focus on rural areas that otherwise may have little potential to attract investment.

Local economic development concerns take a variety of forms in the REIPPPP bid process, not all of which are included in RFP volumes on "Economic Development." For example, the "Qualification" sections of the RFPs note that in order to be bid compliant, all projects

must have South African "entity" participation of at least 40 percent.[13] Other sections of the RFP that call on bidders to submit reviews of their financial models done by professional model auditors, require that the audit letter confirm that no more than 60 percent of project capital investment consists of foreign currency.

But the main presentations of these kinds of requirements are included in RFP volumes on Economic Development. Appendix 4 of the RFP shows how the scoring categories are to be measured, and indicates "thresholds" and "targets" for "onshore wind," one of the seven renewable energy categories covered by REIPPPP. Meeting the threshold level simply means that a bid is minimally compliant. Points are scored by the bid for these categories if the project exceeds the threshold levels (in Round 1, ten points were awarded for achievement between threshold and target levels, and an additional score of ten points for achievements above the target level).

Bidders were required to submit various kinds of documentation to substantiate their economic development commitments including:

- A completed "economic development scorecard" (the template was supplied with bid documents) that scores bidder economic development performance against government targets
- Various kinds of documentation to confirm compliance, including organization charts, employee information, shareholder certificates and agreements, etc.
- An economic development plan that, among other things, identifies the socio-economic needs of the communities surrounding the project site and offers a strategy for meeting those needs with grant funding[14]
- A reporting plan (required at financial close) that breaks down the economic development obligations into quarterly segments over the lifetime of each 20-year project, along with quantitative measures for the obligations to allow for monitoring and evaluation by government

The standard Implementation Agreements (IAs) included in RFP packages for eventual signature by DOE and the winning bidders, lay out an elaborate system of performance rewards and penalties based on the quarterly reporting by contractors. Performance against each economic development commitment is measured using formulas included in a schedule to the IA. Performance credits or penalties are determined quarterly for each subcomponent, then added together at the end of the measurement period (the construction period and each 12-month period thereafter). This determines whether or not the contractor owes DOE penalty payments for under-performance during the period (Over-performance is used only to off-set under-performance. DOE does not make performance payments to contractors). In addition, under-performance during a quarter can result in "termination points" if performance scores below designated thresholds in the IA. If contractors do not respond in a satisfactory way to correct the cause of each termination point, the points are added together at the end of the measurement period. If the total exceeds designated thresholds, DOE is entitled to terminate the agreement. In keeping with what appears to be a complex and labor-intensive system of performance measurement, DOE reserves the right to hire independent verification experts, known as "Economic Development Independent Monitors," who will check contractor reporting and confirm contractor compliance with economic development commitments.

[13] South African "entities" must be based and registered in South Africa, and involve shareholding by South African citizens.

[14] The economic development plan was part of the bid requirement in Windows 1 and 2, but was only required at financial close in Window 3.

REIPPPP warned that one economic development category – local content – would have its thresholds and targets revised upwards over time, as manufacturing capacity increased in the country. Below is a summary of the Local Content Scoring Requirements and the results.

Table 4: REIPPPP Local Content Scoring Requirements and Results

Technology	First Bid			Second Bid			Third Bid		
	Threshold	Target	Actual Bid	Threshold	Target	Actual Bid	Threshold	Target	Actual Bid
Onshore Wind	25%	45%	27.4%	25%	60%	48.1%	40%	65%	46.9%
Solar PV	35%	50%	38.4%	35%	60%	53.4%	45%	65%	53.8%
Solar CSP	35%	50%	34.6%	35%	60%	43.8%	45%	65%	44.3%
Biomass	25%	45%	No bids	25%	60%	No bids	40%	65%	40%
Biogas	25%	45%	No bids	25%	60%	No bids	40%	65%	No bids
Landfill Gas	25%	45%	No bids	25%	60%	No bids	40%	65%	41.9%
Small Hydro	25%	45%	No bids	25%	60%	No bids	40%	65%	No bids

Source: Constructed by the authors from DOE IPP unit data (note: differs from data in DOE presentations).

Local content requirements also underwent other changes as the bidding progressed through the three rounds. In Round 1, "local content" was defined to mean the total costs attributed to each project at the Commercial Operation Date, excluding finance charges, land, and mobilization fees of the Operations Contractor. In Round 2, the definition was refined so that total costs were limited to spending on South Africans and South African products. The exclusions were expanded to cover imported goods and services, as well as finance charges, land and mobilization fees.

Round 2 also included a requirement that bidders provide more detailed information on their local content plans. They were told to provide a breakdown of the components and activities to be undertaken in order to achieve the committed local content figures. Using a template provided in the RFP, the breakdown was to be used to identify the components related to EPC contracts and non-EPC components, the percentage of local content for each, along with the cost figures reflected by the percentages.

Finally, Round 2 also identified components that had been earmarked by the government as priorities for manufacturing in South Africa. These included:

- Wind turbine blades and towers
- PV modules
- PV inverters
- The metal structures used in PV plants

DOE did not actually change its scoring metrics to reflect these priority components and indicated that a "...gradual rollout may be necessary in order to build manufacturing capacity in South Africa" (RSA, Feb.1, 2012). Nevertheless, the department made it clear that future bid rounds would focus on these priority components with the expectation that eventually they would all be manufactured in the country.

In Round 3, the definition of local content was further refined. On the one hand, costs incurred by the private company in connecting to distribution and/or transmission systems were now excluded from the definition. On the other hand, all raw or unworked steel and aluminum used in the local manufacture of components were deemed locally sourced for the purposes of calculating local content. This change reflected the Department of Trade and Industry's desire to encourage local manufacturers of components (e.g., wind turbine towers and solar PV mounting structures) to keep their costs as competitive as possible by seeking the best prices globally for primary steel and aluminum

Round 3 bidders were also required to provide a more detailed breakdown of relevant costs than had been required in earlier rounds, and to differentiate between costs associated with "key components and or equipment" (identified in the RFP) on the one hand, and costs for "balance of plant" on the other. Key components included the earmarked components listed above, plus 18 additional components across the targeted technologies.

The scoring of economic development criteria also changed in later rounds. DOE wanted to incentivize compliant bidders to make commitments that were as high as possible. No points were awarded for commitments up to or equal to the threshold level. The compliant bidder that offered the highest commitment in respect of a specific economic development sub-element was now awarded full points for that sub-element, provided that this commitment was above the target level. Other compliant bidders were awarded points, in proportion, based on their position between the highest compliant bidder and the threshold level, or zero if no threshold level was set.

Table 5 shows DOE's calculations of the numbers of jobs and local content percentages created by different technologies in the different rounds. No doubt the results were influenced by the amount of energy being procured in each round but the comparisons do illustrate the evolution of the economic development outcomes.

Table 5: REIPPPP Economic Development Outcomes

Technology	Round 1	Round 2	Round 3
Solar PV			
Local content %	38.4	53.4	53.8
Local construction jobs	2381	2270	2119
Local operations jobs	6117	3809	7513
Wind energy			
Local content %	27.4	48.1	46.9
Local construction jobs	1810	1787	2612
Local operations jobs	2461	2238	8506
Concentrated solar power			
Local content %	34.6	43.8	44.3
Local construction jobs	1883	1164	3082
Local operations jobs	1382	1180	1730

Source: Constructed by authors from DOE IPP unit data (note differs from DOE presentations).

5.2 ECONOMIC DEVELOPMENT: CRITICISM AND CONTROVERSY

Local, as well as international stakeholders have favorably received many aspects of REIPPPP. But the use of local content requirements seems to have generated considerable criticism and controversy. The following sections review some of these issues.[15]

5.2.1 JOB CREATION

As Table 5 shows, the PV, wind and CSP projects in Rounds 1, 2 and 3 promise to generate approximately 20,000 temporary construction jobs and approximately 35,000 operations jobs.[16] If these figures are accurate, they reflect a considerable achievement, but perhaps not enough to meet all of the stakeholder expectations regarding job creation by REIPPPP. It also may be the case that the combination of all of the economic development requirements may be counter-productive when it comes to job creation. For example, local content requirements are specified in value terms, but the highest value elements of the manufacturing and construction chain are not always, and perhaps seldom, associated with those parts that yield the most jobs. There appears to be considerable potential to refine local content requirements so that they maximize job creation, if that is the intent.

5.2.2 OWNERSHIP AND JOBS VS. CAPACITY BUILDING

South African ownership and management control and jobs for South Africans combine to account for 45 percent of the non-price value of bids. But the international experience with these kinds of requirements suggests that this kind of focus may be misdirected. One international review of such requirements describes the "primary lesson" from best practice in terms of the need to focus on local capacity building and domestic value-addition,regardless of the nationality of the firms, employees, or investors (WTI, 2013). Local ownership may be desirable, but it is not the same thing as capacity building, which involves the development of managerial, technical and operational skills in national firms and the domestic labor force. And to achieve the highest level of industrial capacity building, policymakers must focus in a coordinated way on basic policy deficiencies affecting infrastructure development, trade/industrial policy, and skills development and transfer. Otherwise, these requirements become little more than additional costs for foreign operators and the end users.

5.2.3 MANUFACTURING

Local content requirements for Round 3 had the effect of making firms move away from simply sourcing local materials, for elements like support structures, toward the establishment of local manufacturing capacity for high value components like wind turbines and blades. But several issues make this particularly risky for competing firms. First, globally, manufacturing of components for both wind and solar PV involve relatively mature, existing technologies and well-established industries. Moreover, these industries already are experiencing global over-capacity and intense competition that is resulting in very thin profit margins, if any profits are generated at all. The question for bidders

[15] One issue not discussed here is the possibility that the World Trade Organization (WTO) might take action against the use of local content requirements in REIPPPP, as the WTO did recently against the use of such requirements in a feed-in tariff program sponsored by Canada's Ontario province. Like Canada, South Africa would be bound by a WTO decision on this matter. However, an extensive legal analysis, published by the International Centre for Trade and Sustainable Development (ICTSD), suggests that South Africa would avoid WTO action against local content requirements. This is because these requirements are used in a public procurement scheme, as opposed to a support scheme like that employed in connection with Ontario's FIT program. Public procurement is governed only by a single article in the General Agreement on Tariffs and Trade (GATT), which is unlikely to be applied by the WTO in cases of renewable energy (Kuntze and Moerenhout, 2013).

[16] REIPPPP's job figures seem somewhat misleading. The unit of measure for operations jobs is person-years, calculated over the 20-year life of the project. For construction jobs, the unit is person-years calculated over the construction period (typically 18 months). These figures are highly aggregated, designed to compare with figures from other industries. But the measurements are different for different industries, and therefore the comparisons are questionable. Overall, the REIPPPP job measurement is simplistic, and "job creation" is marketed to the public in a way that most people probably do not understand.

beginning with Round 3 is whether or not the government-driven demand for renewable energy can be sustained long enough, and at high enough levels (and high enough prices) to make commercially feasible the establishment of manufacturing capacity. This exists in an environment where power generation has fallen behind demand, and consumers are already unhappy with the high cost of electricity. International experts urge that instead of protecting non-competitive local producers of standard technology, governments should support research and development in innovative renewable technologies that can create a new wave of early movers, whether foreign or domestically owned (Peszko, 2012)[17]

5.2.4 ENTERPRISE AND SOCIO-ECONOMIC DEVELOPMENT

An area of particular confusion for many bidders has been the economic development requirements for "enterprise development" and "socio-economic development," accounting for a total of 20 percent of the non-price bid value of REIPPPP proposals. Bidders must assess the needs of communities within a 50 km radius of project sites and prepare strategies covering how these needs will be met with contributions from the project's revenues. Socio-economic development plans must be prepared by bidders and submitted with proposals. But beyond these minimal instructions in the tender documents, DOE has provided no guidance on how to prepare acceptable plans, how to demonstrate potential benefits, and has given no indication of how these submissions will be scored. Experts at the Energy Research Centre at the University of Cape Town pointed out that the bidders are renewable energy project developers, not community development experts, and the lack of guidance risks severe errors in the development of these grant program. Among many other things, they noted that it was premature to develop meaningful socio-economic development plans as part of a bid process, and the arbitrary 50 km radius requirement risks dividing communities, villages and towns into beneficiaries and non-beneficiaries: "Confusion and conflict are risks inevitably associated with such a restriction..." (Wlokas, Boyd, and Andolfi, 2012). Making matters even more complicated, the responsibility for informing communities regarding these and all other economic development requirements lies with the project developer, because the detailed requirements in the bid documents and related guidance notes have never been disclosed to the public.

Other critics have pointed to a severe conflict of interest between developers and eventual owners of these projects. Developers have incentives to promise substantial community benefits in order to secure projects, but owners (where they are different from developers) are left to actually deliver on promises. This also has a tendency to create unrealistic expectations on the part of communities.

A final concern among bidders has been that some of the direct financial benefits to local communities, particularly the project dividends that go into community trusts, are not likely to materialize until well into the life of the infrastructure after loans that have financed local community equity have been serviced. This may not be soon enough to forestall disappointment among community leaders, some of whom clearly expect to realize quick financial gains from REIPPPP. The capacity of the DBSA and IDC to continue to fund community equity may also be limited.

[17] A related controversy has been the persistent allegation, especially voiced by local bidders, that despite refinements to the requirements by the DOE IPP unit some EPC contractors have successfully "gamed" the system by circumventing these requirements. For example, some projects have scored well on local content, but are allegedly importing fully assembled PV panels. These high scores are probably only possible if panels are sold by parent companies to local subsidiaries at below market prices, and then the local mark up on the panels is counted as part of local content value-addition.

Key Success Factors, Shortcomings and Risks

Through its first three bid rounds, the South African REIPPPP program has registered impressive achievements. One large, equity investor noted that REIPPPP was the most successful public effort to attract private investment in infrastructure in Africa. To date, it has secured investment commitments of US$14 billion to build 3922 MW of new renewable energy generating capacity. This places the program among the top ten privately funded renewable energy programs in the world in recent years. Power prices have become competitive over the last two bid rounds, and the speed of implementation has been unprecedented. The vast majority of program stakeholders, from both the public and private sectors, judge it to be highly successful over its first three rounds.

The next section attempts to identify factors that account for the success of the REIPPPP. In addition, the section looks at program shortcomings, as well as some of the risks going forward. These factors are organized under three general headings: 1) program management, which primarily covers the government's administration of the program, how it was done, who did it, etc.; 2) program design, which includes the size and structure of the program; and 3) market factors, which include characteristics of the marketplace environment in which the bidding took place, including the bidders, private financiers, advisors, as well as donors and multilateral development banks.

6.1 PROGRAM MANAGEMENT FACTORS

6.1.1 POLITICAL SUPPORT

REIPPPP benefited tremendously from high-level political support, in the form of a relatively long history of policy statements on renewable energy, but more importantly, President Zuma's commitment to green energy during the COP15 meeting in Copenhagen and South Africa's subsequent hosting of COP17 in Durban, where the government's Green Accord with business and other stakeholders was signed.

A deeper analysis of the political economy of these commitments is required but is beyond the scope of this paper. Why did South Africa voluntarily commit to reducing carbon emissions when it faced no binding obligations under the United Nations Framework Convention on Climate Change or the Kyoto protocol? And why did South Africa proceed even though its Copenhagen offer was subject to financial assistance that has not materialized? Post Copenhagen, South Africa transformed its electricity planning. It incorporated a carbon emissions cap in its Integrated Resource Plan and for the first time renewable energy options featured even though the overall cost of the electricity plan increased. For a country as dependent on coal for its energy, and facing extraordinary poverty and development challenges, this was a striking break from the past. The effectiveness of the Department of Environmental Affairs in building coalitions and influencing the Department of Energy, Eskom and industry stakeholders to accept a new electricity-planning paradigm deserves more in-depth study.

6.1.2 INSTITUTIONAL SETTING

The largely ad hoc institutional status of the DOE IPP unit, acting at arm's length from DOE as a kind of dedicated project office, allowed and, to some extent, encouraged an operating approach that emphasized problem solving to make the program successful, rather than automatically following government operational policies and procedures that emphasized enforcement of rules.

6.1.3 THE REIPPPP MANAGEMENT TEAM

The team and the team leader had extensive experience working with the private sector. They had an excellent working knowledge of PPP contracts; experience managing consultants, and credibility with both public and private sector stakeholders.

6.1.4 MANAGEMENT STYLE

Because of its background and skills, the DOE IPP unit exhibited none of the kind of mistrust of private business that sometimes characterizes other government agencies in South Africa. Dialogue with private sector counterparts on key REIPPPP issues began almost immediately as did the use of external, private sector expert advisors.

6.1.5 PROGRAM RESOURCES

By successfully accessing funding from sources like the DBSA, donors, and a National Treasury jobs fund, then establishing a mechanism to capture fees from closed projects, the program was able to remain largely off the formal government budget through the first three bidding rounds.

6.1.6 QUALITY OF TRANSACTION ADVICE

The DOE IPP unit made sure that they selected experienced local and international transaction advisors who would be successfully able to transfer international best practice in PPPs and renewable energy procurement into the South Africa context. Teams of professionals from different legal and financial firms were required to sit together to draft procurement documentation and contracts. There was excellent cooperation between these firms and the end result was a quality procurement process.

6.1.7 PROGRAM MANAGEMENT SHORTCOMINGS

The transaction costs for the REIPPPP program were generally high for both the government and the bidders and certainly higher than for a REFIT program. The government has had to rely on external transaction advisers. There is potential for the transfer of skills and experience in future procurement rounds and to build capacity in the proposed independent system and market operator. But it is unclear how quickly such capacity can be built to levels where substantial external advice will not be needed. Unless handled carefully, the early departure of external advisors could be viewed as a signal of program decline.

6.1.8 PROGRAM MANAGEMENT RISKS GOING FORWARD

One of the most significant risks to the sustainable success of REIPPPP relates to one of the program's key success factors – its ad hoc character. The non-departmental institutional setting, the off-budget funding, and the entrepreneurial attitude of the project have all helped facilitate the programs successful performance and avoid the delays and indecision that in the past have crippled earlier attempts to develop IPPs in the power sector. But this ad hoc character will inevitably give way to some kind of formalization, if only to guarantee a more secure source of funding and sustainability for the program. The challenge will then be to proceed with institutionalization in a way that preserves as many of the program management success factors as possible. If Eskom is unbundled in the future, then it will make sense to locate future IPP procurements in the Independent System and Market Operator.[18]

[18] A system and market operator basically schedules and dispatches generation resources to meet demand, but also typically performs a number of additional functions including system planning and procurement and contracting of new capacity (within the framework of priorities set by DOE's Integrated Resource Plan). Currently in South Africa, core system operator and market functions are performed by Eskom, the state-owned, vertically integrated, single-buyer of power for distribution to munciplaities and also direct customers. But critics argue that this is a conflicted role, because Eskom is a producer, as well as the primary purchaser of electricity. If Eskom could be unbundled, arguably a system operator could be set up to function independently of Eskom to more effectively source needed power generating capacity, using all available private, as well as public, sources. This would be an "independent" system and market operator.

6.2 PROGRAM DESIGN FACTORS

6.2.1 ACCELERATED ROLL-OUT OF NEW GENERATING CAPACITY

Despite the higher initial cost of renewable energy, REIPPPP offered South Africans something they thought they urgently needed in 2011, a relatively fast way to roll out new power generating capacity. While it would take years for the large power projects planned by Eskom to begin generating power, REIPPPP was designed to roll out a significant amount of power in a very short time, using transparent procurement and implementation processes. Stakeholders of all kinds, including critics of the initial higher cost of renewable energy, appear to have adopted a wait-and-see attitude toward REIPPPP, giving it time to build momentum. As renewable energy costs fall, and South Africa faces ongoing supply shortages, industry players are asking why the DOE is not contracting more renewable energy that is on offer.

6.2.2 PROGRAM SIZE

As noted earlier, REIPPPP is the largest national IPP program ever attempted in Africa. The program immediately caught the attention of the global energy development industry, particularly because the European renewable energy markets had been in decline. The program's size meant that there would be multiple bid winners and future prospects.

6.2.3 POTENTIAL PROJECT PROFITABILITY

Initially, REIPPPP clearly represented opportunities for developers to make reasonable profits. When the Round 1 bid documents were released in August 2011, developers saw what one called "REFIT-like" tariffs with caps set at or near REFIT levels, meaning that the projects could potentially make equity returns close to 17 percent. The clear potential for profitable Round 1 projects helped initiate interest in the program on the part of a wide range of bidders, which has carried over into subsequent bid rounds.

6.2.4 THE SHIFT FROM FITS TO COMPETITIVE TENDERS

The shift to competitive tendering seems to have helped tariffs come down sharply after Round 1, and this reduction was a major factor in the government's willingness to continue its support for REIPPPP as a "successful" program. For many developing countries and emerging markets, including South Africa, the argument for greater use of potentially more expensive renewable energy technologies resonates only when efforts are made to clearly keep costs under control. REIPPPP does not prove conclusively that competitive tendering is better able to do that than FIT programs, but it does suggest that this might be the case and should be explored more vigorously even in contexts where electricity markets are not as large.

6.2.5 MULTIPLE BIDDING ROUNDS

A key design alteration made before August 2011 was to change the REIPPPP from a once-off tender to a rolling series of bid rounds. The multiple bid rounds have had a significant impact in terms of building confidence in the program among operators and investors and generating increasing levels of competition as more and more of these players begin to participate in the tendering. Overall, the number of bidders increased by 49 percent from the first to second rounds, and another 18 percent in the third round.

6.2.6 EXEMPTION FROM PPP REGULATIONS

Exempting IPPs from national PPP regulations by defining the national government-owned power utility – in its role as the off-taker and contractor – as something other than a government agency, employs a definitional distinction that would not always be possible in other countries. But whatever the reasoning, subjecting these IPPs to South Africa's complex and time-consuming PPP rules would have dramatically slowed and, perhaps subverted, this successful program.

6.2.7 NON-NEGOTIABLE PROGRAM CHARACTERISTICS

In some ways, REIPPPP was perceived to be "private sector–friendly," but the team also had enough experience with private sector investment deals to understand where and how to control bidder behavior and restrict opportunities for gamesmanship or time-consuming negotiations. Chief among these efforts were the non-negotiable PPAs and IAs that were made available to bidders along with other tender documents, the standardized set of financial data that bidders were required to provide for evaluation models, and the requirement that bids be fully underwritten with debt as well as equity.[19] This latter requirement effectively eliminated one of the main shortcomings of typical tender processes – that they incentivize under-bidding (or "low-balling") to win contracts, then renegotiation in the hopes of securing more profitable deals.

6.2.8 ECONOMIC DEVELOPMENT REQUIREMENTS

REIPPPP's economic development requirements have been controversial, often confusing, and expensive for bidders to respond to these requirements. But in South Africa, as in other countries, these requirements have also helped to generate political support for these programs from politicians, investors, as well as the general public. By increasing the role of these factors to 30 percent of bid value, the program helped increase the visibility of economic development considerations and underscore their importance. The South African Parliament seems to have concluded that the economic development dimension of the program has been successful, based on the commitments made during the bid rounds.

6.2.9 SOVEREIGN GUARANTEE

The political will behind the program, mentioned above under management factors, was given practical shape in the form of sovereign guarantees in the Implementation Agreements backing Eskom's purchase of power from the renewable energy projects. The National Treasury's Fiscal Liability Committee that formally approved the issuing of the government guaranty scrutinized the transactions. (There is no reserve fund or contingent liability fund set aside for each transaction). South Africa's relatively strong international credit standing means that banks and investors will accept sovereign country risk without requiring political risk insurance, as would be the case in virtually every other African country. What is interesting is that these sovereign guarantees were required (or offered) despite Eskom's investment grade credit rating. Clearly, there are concerns around Eskom's financial standing and perhaps the prospects of unbundling and electricity sector reform.

[19] Other standardized agreements included Implementation Agreements and Direct Agreements.

6.2.10 PROGRAM DESIGN SHORTCOMINGS

- Market readiness overestimated. The size and readiness of the local renewable energy market were initially overestimated, resulting in limited competition in Round 1 and bid prices close to the price caps. It might have been more prudent to start smaller, then gradually ramp up the program, with larger blocks of capacity being offered in subsequent rounds.
- Closed envelope bids versus dynamic reverse auctions. Use of the single-price offer (rather than a dynamic reverse auction as employed, for example, in Brazil) also may have restricted competition.[20]
- High transaction costs. The transaction costs for the REIPPPP were higher for both the government and the bidders than they would have been for a REFIT program, although these costs were ultimately small for investors compared to the overall project costs. Without its early access to adequate financial resources and expertise, the DOE IPP unit would have struggled to achieve the quality levels that contributed so much the continuing interest of private sector players in REIPPPP.
- Bias against SMEs. Finally, higher costs of this kind can be covered by larger and more established companies, but potentially serve as a bias against SMEs and work against most governments' explicit policies in favor of SME involvement in the renewable energy sector. However, the large number of investors and community trusts involved in the REIPPP is an indication that opportunities have been made available to new players. SME's were brought in by bigger companies as minority shareholders on a number of the bids. Also, the entire REIPPPP program has created multiple opportunities for SMEs in the form of advisory services, economic and social development consultants and construction contractors. The parallel, small projects IPP procurement is an attempt to do more than REIPPPP to encourage local SME involvement in the sector.

6.2.11 PROGRAM DESIGN RISKS GOING FORWARD

Four kinds of program design risk may create problems in the future:

- Delivery failure. The first dimension involves the possibility that the economic development requirements will not deliver expected results. In particular, support for new South African industries aimed at the production of renewable energy components will face challenges in a global industry already affected by over-supply and severe competition. Job growth resulting from such requirements may not be sustainable in the long term and is likely to result in higher costs for power than would have been the case without the requirements. Finally, local communities may see fewer real financial or economic benefits from local projects than they expect. This inevitably leads to disappointment with and confusion about the community development aspects of the economic development requirements. Each project is expected to invest at least one percent of revenues in community development, but few project developers have experience in designing effective programs. Furthermore, the benefits that should accrue through local community shareholding will take time to be realized: shareholder loans will first need to be repaid. In general, an inability of REIPPPP to deliver in these areas could result in local community dissatisfaction. It could also highlight, at a national level, the relatively higher costs of some of the renewable energy supply technologies, leading to questions about the wisdom of pursuing these energy alternatives and potentially undermining the overall political support for the program.
- Failure to monitor/manage. A second, related dimension of risk involves the possibility that the economic development activities will not be appropriately monitored or managed by the government over the life of the contracts. Several notable examples exist of agencies responsible for monitoring local content performance in developed countries, which have struggled to adequately perform their tasks despite having considerable numbers of professional staff (WTI, 2013). After the first three rounds of bidding, the REIPPPP had generated

[20] Dynamic, reverse auctions literally reverse the roles of buyers and sellers. A single buyer offers a contract for bidding. Multiple sellers then offer bids on the contract. As the auction progresses, sellers compete with lower prices. The buyer is able to see all of the offers and choose any that are attractive. When done in real time, usually via the internet, the dynamic reverse auction can achieve rapid decreases in price that are not usually possible with static, paper-based bidding.

64 separate IPP contracts, each with a lifespan of 20 years, each involving commitments to as many as 17 economic development targets, each reporting performance on a quarterly basis. As described above in Sect. 5.1, this reporting in turn will be used to calculate performance deductions or credits, as well as termination points. In the cases of termination points, contractor rectification programs must be reviewed in most cases, and dispute resolution is likely to be needed in some cases. The standard Implementation Agreement makes vague mention of the fact that DOE reserves the right to hire "Economic Development Independent Monitors" who may be recruited in some cases to help DOE confirm contractor compliance. But without a substantial number of permanent professional staff and an ongoing government budget allocation to cover performance monitoring and evaluation costs, it is difficult to see how this monitoring work can be sustained at an appropriate level.

- Transmission constraints and deemed energy payments. It is becoming apparent that Eskom's transmission planning has lagged, or has not been synchronized with, the REIPPPP award of new generation projects. There is a risk that some completed renewable energy projects may not be able to connect to the grid in a timely fashion. The problem is generally not the shallow connections (i.e., the transmission connections to the nearest substations that most developers are funding or constructing themselves), but rather the deep connection investments that Eskom needs to make to strengthen the transmission backbone to evacuate all the new energy that is generated in these remote areas. In these cases, Eskom as the off-taker will be liable for deemed energy payments, even though no electricity is being fed into the grid. These situations could lead to reputational risks for REIPPPP.
- The single-buyer role of Eskom. This is a topic that has been at the center of a fierce debate in South Africa for over a decade, and a complete discussion of it is beyond the scope of this paper. Critics have argued that the utility has been mismanaged and is now in significant financial distress. A solution long promoted by the international development community is to break up the utility by unbundling its key functions into generation, transmission, and distribution companies, some or all of which can eventually be privatized. Eskom's possible future circumstances present obvious risks to a program like REIPPPP. If Eskom's financial health continues to deteriorate, the government's sovereign guarantee may have to be called on to pay IPPs. In turn, that could affect the government's credit standing. If Eskom were eventually unbundled, a successor entity would presumably inherit the PPA contracts (and sovereign guarantees). The credit worthiness of any such successor would be of critical concern to the national government and IPPs alike. At the moment, the prevailing view in government seems to be that Eskom should continue as is – as the state-owned national monopoly utility that acts as a single-buyer of power for distribution to rate payers. But, if that view begins to change, it will have implications for the future of REIPPPP.

6.3 MARKET FACTORS

6.3.1 GLOBAL SUPPLY AND DEMAND OF RENEWABLE ENERGY

The interplay of renewable energy supply and demand at the global level has clearly benefited REIPPPP. The slow-down in OECD markets meant that a program the size of REIPPPP attracted considerable attention from the international private sector. This helped increase competition and lower prices as the bidding proceeded.

6.3.2 DONOR AND MULTILATERAL DEVELOPMENT BANK SUPPORT FOR RENEWABLES

The public policy aspects of renewable energy, particularly the perceived need to use it in mitigating climate change, have generated interest in renewable energy among members of the international donor community, including bi-lateral donor agencies and multi-lateral development banks. Even though renewable energy generation is already a worldwide commercial industry, in some cases this interest on the part of donors and DFIs translates into the willingness to use grants, concessional finance or innovative financial instruments to promote the expanded use of renewable energy. REIPPPP benefited to an extent from early-stage donor funding of technical assistance, as well as the involvement by DFIs (e.g., the IFC) as project financiers. Donors and DFIs have also discussed the idea of issuing bonds to help with the

refinancing of existing REIPPPP project debt, and the creation of donor-capitalized facilities to provide subsidized transaction support and project credit enhancements. In early 2014, the South African government issued a tender to design and structure a fund that would facilitate DFI participation in future REIPPPP windows. More DFI funding probably will be needed for BEE and community ownership in future rounds.

6.3.3 THE SOUTH AFRICAN BANKING SECTOR

The country's banking sector has also played a large role in the success of the program. This sector is the largest, deepest, and most sophisticated in Africa. It is highly liquid, offers long-term debt (15 to17 years for REIPPPP projects), understands project finance, and has experience with PPPs and private finance of public infrastructure. The sector also includes a small, but functioning secondary market in bonds and syndicated paper. While the industry is perceived to be conservative and expensive, it has been essential in helping REIPPPP achieve so many closed transactions in a relatively short period of time.

6.3.4 OTHER ADVISORY SERVICES

South Africa also has a relatively wide array of other kinds of sophisticated advisory services needed for REIPPPP projects, including legal firms and technical consultants (and also burgeoning economic and social development advisors) available to help with the design and implementation of competitive bids. These services were essential for the success of REIPPPP, but were stretched to the limit by the size of the program.[21]

6.3.5 MARKET SHORTCOMINGS

- Limits on the supply of advisory services. Because of the huge demands made on the local consulting industry, some firms were permitted to offer advisory services to both the government and private bidders and funders as long as they created adequate internal barriers within the firm to limit potential conflicts of interest. Some bidders complained that legal and financial firms were offering a "one size fits all" service, which was not always appropriate for specific projects.
- Inability to support small projects. The risk-averse character of South Africa's sophisticated commercial banking sector has meant that it has been limited in the extent to which it can enthusiastically support all of REIPPPP's objectives. For example, one objective has been to allow small- and medium-sized South African firms to gain footholds in the country's emerging renewable energy industry. In an effort to more directly pursue this objective, the government launched the so-called Small Scale Projects IPP Tender in August 2013, aimed at smaller-scale projects of 1 to 5 MW of installed capacity. But the South African commercial banking sector lacks the incentives to support these smaller projects. Smaller sponsors that lack the bargaining power to negotiate cost-effective contracts for supply, operations, and maintenance, or lack the experience to mitigate completion and performance risks, face the prospects of higher equity requirements or higher debt margins. For many South African banks, these kinds of sponsor risks mean that many smaller projects are simply not commercially viable or are not even worth due diligence costs.

[21] The size and potential life-span of the program has also encouraged international consultancies to establish offices in South Africa.

6.3.6 MARKET RISKS GOING FORWARD

The principal market-related risks are associated with the volatility of private sector interest in such a program, and the likelihood of operators and investors backing away from new bid rounds the moment that events suggest that their interests are better served elsewhere:

- Global market recovery. If the global slow-down affecting the renewable energy industry experiences a turn-around. and the industry begins to demonstrate renewed growth, there may be much less interest in REIPPPP among operators and investors, particularly if the program's economic development requirements become more onerous.
- Inability to lower prices further. A number of private sector actors have noted that bid pricing has likely bottomed-out. Prices have come down because of increased corporate balance sheet funding, tougher negotiations with EPC contractors, and more cost-effective sourcing of components. Bank spreads have remained largely unchanged over the three rounds, and there is little indication that they will decrease in the future (although the dominance of two of the South African banks in Round 3 may spur the others to be more competitive in Round 4). Due to a lack of foreign exchange protection, sponsors are unlikely to turn to foreign banks for financing. If domestic banks are unable to syndicate existing REIPPPP debt off their books, spreads could actually increase due to higher liquidity premiums. Nevertheless, the government is likely to press for lower bid prices because: South African prices are still higher than those being achieved in other jurisdictions.[22] But any additional efforts to use caps to push for further price reductions may diminish the bankability of projects and the interest of the private sector. The same is true if the governmentpushes for more onerous economic development requirements to increase value for money.[23]
- Negative reactions to program formalization. Efforts to institutionalize what has been, to date, a largely administratively ad hoc program could lead to delays and indecision. Private sector actors still seem enthusiastic about participating in the program, but remain extremely vigilant regarding any sign of a return to the pre-REIPPPP management style that led to so many costly and disappointing failures.

[22] For example, Brazil has achieved bid prices for wind energy below 5 USc/kWh compared to South Africa's lowest bid of 6.6 USc/kWh in Round 3.

[23] Exacerbating this problem is the likelihood that the local DFIs like DBSA and IDC who have been financing economic development activities have run out of funding for this work or will soon do so.

Lessons for Other Developing Countries

South Africa's REIPPPP program provides a valuable opportunity to learn how to procure renewable energy projects quickly and effectively in developing countries. Of course, not all of REIPPPP's success factors can be easily duplicated, particularly in low-income countries. Most African countries cannot mount a program of REIPPPP's size, or with its rolling, multi-round sort of bid process. No African country has the kind of banking, legal and other advisory resources that are readily available in South Africa. And few developing countries can easily muster the kind of program resources that South Africa has applied to REIPPPP, although it should be recognized that South African banks, infrastructure funds, and advisory services are increasingly active in the rest of Africa. However, not all of the success factors in the South African REIPPPP need to be precisely duplicated. Some can be replicated with proxies; others may be ignored. Nevertheless, the South African experience does suggest lessons regarding what factors are essential in countries where the government and private sector players are strongly committed to rolling out a renewable energy program.

7.1 ADOPT A BUSINESS-FRIENDLY APPROACH

Private sponsors and investors in the renewable energy sector want to sell power to governments, particularly now that the global market for these services still seems to be recovering. If deals are reasonably profitable and key risks are mitigated in an acceptable manner, a considerable amount of private sector interest is likely. And the likely interest of commercial banks, infrastructure funds and project sponsors from other emerging economies should not be underestimated. REIPPPP's operators and investors have shown remarkably little sensitivity to past mistakes and policy shifts in the power sector, and although they remain wary of the consequences of future policy changes or problems resulting from attempts to formalize the structure of the program, they seem remarkably confident that their projects will endure. For that reason, to date such policy and governance issues have not played a significant role in bank credit committee decisions on projects. Private sector players in South Africa seem most impressed with factors that would be relatively easy to replicate – things like the efforts of the DOE PPP unit to communicate with them on key issues, the unit's track record of consistently meeting program deadlines, the widespread use of private sector advisors, and the general business-friendly approach of the program.

7.2 TAKE ADVANTAGE OF EXTERNAL SOURCES OF FUNDING

Donors and DFIs are inclined to help with renewable energy programs, and the funding they provide can help fill a variety of gaps. Donor funding can help improve internal capacity to design and manage these programs, by supplying advisors, covering procurement costs, etc. Donors can also help reduce project preparation costs (e.g., by paying for standardized documentation), as well as provide credit enhancements for project sponsors. Partial risk guarantees offered by DFIs can be critical in strengthening sovereign government guarantees in countries with below-investment grade credit ratings. Donors are generally eager to help with the implementation of the small-scale IPP program. Other countries with government commitment to well-designed, renewable energy programs, should explore the possibility of eliciting support from donors and DFIs.

7.3 MAKE A CASE FOR RENEWABLE ENERGY (...AND KEEP MAKING IT)

In most developing countries, a convincing case needs to be made repeatedly to justify the procurement of renewable energy. REIPPPP was preceded by several years of policy proposals that supported climate change mitigation. This background, combined with the looming threat of power shortages in the country, and frustration with Eskom's lack of action on IPPs, meant that REIPPPP was initially given the benefit of the doubt, even by critics of renewable energy costs. As the tender design work started, the DOE IPP unit emphasized the service delivery and economic development impacts of the program. Again, this resonated with politicians and rate payers who were worried about unemployment and lack of economic and social development in rural areas, as well as with some investors interested in social impacts, such as pension funds. The economic development requirements suggested that REIPPPP would generate tangible benefits that should help offset the increased costs for power. Above all, the DOE IPP unit kept making the case for the program at every opportunity, in informal government meetings, conferences, cabinet meetings, and presentations before Parliament. No one was allowed to forget that the program seemingly had strong justifications.

7.4 FIND A PROGRAM CHAMPION

It is almost a cliché now to talk about the importance of program champions in driving successful programs of this kind. Someone with credibility needs to be able to interact convincingly with senior government officials, effectively explain and defend the program in meetings with stakeholders, deal with donors, select and manage consultants, communicate with the private sector, and manage a complicated procurement and contracting process. This does not necessarily need to be a senior government official. But it should be someone who is familiar with (and familiar to) senior officials, as well as someone with enough experience working with the private sector to be comfortable adopting the business-friendly approach mentioned above. This is a clear lesson of the REIPPPP program success, but represents a success factor that is profoundly difficult to replicate.

7.5 IDENTIFY A PROGRAM DESIGN THAT SUITS COUNTRY CIRCUMSTANCES

Developing countries and their development finance partners should carefully consider the extent to which different elements of program design fit country circumstances. REIPPPP illustrates this lesson in the government's consideration of competitive tenders relative to feed-in tariff regimes. FITs have, of course, long been the default approach in renewable energy programs, and were in fact strongly advocated by some of the REIPPPP advisors. FITs are less costly to manage than tenders or auction and can include price caps or periodic tariff adjustment mechanisms as ways to control prices. But REIPPPP's experience suggests that competitive tenders for renewable energy are potentially an attractive alternative to REFITs because they may be able to keep tariffs under tighter competitive control. Various adaptations of the REIPPPP are possible including lowering transaction costs through simpler Requests for Proposals (RFPs) and economic development requirements. REIPPPP demonstrates that funding the higher initial transaction costs will ultimately be more cost-effective if lower power prices eventually result from the process.[24]

[24] The case for auctions is similar to that for tendering. Competitive tenders generally incorporate a weighting of price and non-price factors, while auctions are awarded solely on the basis of lowest price (sometimes after a number of bidding rounds) 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. In some situations, it might be worthwhile to explore the possibility of a hybrid design in which winning prices from a dynamic reverse auction are subsequently weighted with non-price factors.

7.6 ENSURE QUALITY PROCUREMENT AND CONTRACTING DOCUMENTATION AND PROCESSES ARE IN PLACE.

Whether a FIT or competitive tender is chosen, an effective procurement mechanism is required, which issues RFPs, has clear qualification and evaluation criteria, and has bankable power purchase and implementation agreements, as well as appropriate credit enhancement or security arrangements that enable projects to be bankable. Many developing countries have simply published FITs without putting in place an effective procurement, contracting and implementation framework with the result that few projects have closed. Perhaps the most important lesson to transfer from the REIPPPP is the benefits of a well-designed and transparent procurement process. For example, the GETFit program is Uganda has created a hybrid between feed-in tariffs and a series of procurement windows that have facilitated investments in grid-connected renewable energy. While the complexity and cost of the South African procurement and contracting documentation may be inappropriate in smaller jurisdictions, the core lesson is that private sector project developers need a clear framework within which to invest, and the procurement program needs consistent, timely, and expert implementation.

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Appendix 1: Eskom's Power Stations[25]			
Name	**Location**	**Fuel**	**Available MW**
Arnot	Middelburg	Coal	2232
Camden	Ermelo	Coal	1430
Duvha	Witbank	Coal	3450
Grootvlei	Balfour	Coal	950
Hendrina	Hendrina	Coal	1865
Kendal	Witbank	Coal	3840
Komati	Middelburg	Coal	940
Kriel	Bethal	Coal	2850
Lethabo	Sasolburg	Coal	3558
Majuba	Volksrust	Coal	3843
Matimba	Lephalale	Coal	3690
Matla	Bethal	Coal	3450
Tutuka	Standerton	Coal	3510
Acacia	Cape Town	Gas/petroleum	171
Ankerlig	Atlantis	Gas/petroleum	1327
Gourikwa	Mossel Bay	Gas/petroleum	740
Port Rex	East London	Gas/petroleum	171
Gariep	Orange River	Hydro	360
Vanderkloof	Orange River	Hydro	240
Drakensberg	Bergville	Pumped storage	1000
Palmiet	Grabouw	Pumped storage	400
Koeberg	Cape Town	Nuclear	1830
TOTAL			**41847**

Source: Eskom Annual Report (2012).

[25] Figure excludes four small, non-operating hydro plants in Transkei. The balance of non-Eskom generating capacity totals about 1,150 MW and is located mainly at Sasol's synfuels plant (520 MW), Kelvin (128 MW), Rooival (155 MW), Pretoria West (100 MW), Steenbras (180 MW) and mini-hydro (65 MW).

Appendix 2: South African Integrated Resource Plan 2010-30

	Committed Build											New Build Options									
	RTS Capacity (coal)	Medupi (coal)	Kusile (coal)	Ingula (pumped storage)	DOE OCGT IPP (diesel)	Co-generation, own build	Wind	CSP	Landfill, hydro	Sere (wind)	Decommissioning	Coal (PF, FBC,ilmports)	Gas CCGT (natural gas)	OCGT (diesel)	Import Hydro	Wind	Solar PV	CSP	Nuclear	Total new build	Total system capacity
	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW	MW
2010	380	0	0	0	0	260	0	0	0	0	0	0	0	0	0	0	0	0	0	640	44535
2011	679	0	0	0	0	130	0	0	0	0	0	0	0	0	0	0	0	0	0	809	45344
2012	303	0	0	0	0	0	300	0	100	100	0	0	0	0	0	0	300	0	0	1103	46447
2013	101	722	0	333	1020	0	400	0	25	0	0	0	0	0	0	0	300	0	0	2901	49348
2014	0	722	0	999	0	0	0	100	0	0	0	500	0	0	0	400	300	0	0	3021	52369
2015	0	1444	0	0	0	0	0	100	0	0	-180	500	0	0	0	400	300	0	0	2564	54933
2016	0	722	0	0	0	0	0	0	0	0	-90	0	0	0	0	400	300	100	0	1432	56365
2017	0	722	1446	0	0	0	0	0	0	0	0	0	0	0	0	400	300	100	0	2968	59333
2018	0	0	723	0	0	0	0	0	0	0	0	0	0	0	0	400	300	100	0	1523	60856
2019	0	0	1446	0	0	0	0	0	0	0	0	250	237	0	0	400	300	100	0	2496	63352
2020	0	0	723	0	0	0	0	0	0	0	0	250	237	0	0	400	300	100	0	2010	65362
2021	0	0	0	0	0	0	0	0	0	0	-75	250	237	0	0	400	300	100	0	1212	66574
2022	0	0	0	0	0	0	0	0	0	0	-1870	250	0	805	1143	400	300	100	0	1365	67939
2023	0	0	0	0	0	0	0	0	0	0	-2280	250	0	805	1183	400	300	100	1600	2358	70297
2024	0	0	0	0	0	0	0	0	0	0	-909	250	0	0	283	800	300	100	1600	2424	72721
2025	0	0	0	0	0	0	0	0	0	0	-1520	250	0	805	0	1600	1000	100	1600	3835	76556
2026	0	0	0	0	0	0	0	0	0	0	0	1000	0	0	0	400	500	0	1600	3500	80056
2027	0	0	0	0	0	0	0	0	0	0	0	250	0	0	0	1600	500	0	0	2350	82406
2028	0	0	0	0	0	0	0	0	0	0	-2850	1000	474	690	0	0	500	0	1600	1414	83820
2029	0	0	0	0	0	0	0	0	0	0	-1128	250	237	805	0	0	1000	0	1600	2764	86584
2030	0	0	0	0	0	0	0	0	0	0	0	1000	948	0	0	0	1000	0	0	2948	89532
TOTAL	**1463**	**4332**	**4338**	**1332**	**1020**	**390**	**700**	**200**	**125**	**100**	**-10902**	**6250**	**2370**	**3910**	**2609**	**8400**	**8400**	**1000**	**9600**	**45637**	

Source: Department of Energy (2012).

Appendix 3: REIPPPP Economic Development Objectives

Categories	Overall Weights	Description	Objectives		
			BEE	Community Benefits	Jobs & SA Content
1. Job Creation	25%	SA-based employees who are citizens			6.25%
		SA-based employees who are black citizens	6.25%		
		Skilled employees who are black citizens	6.25%		
		SA-based employees who are citizens from local communities		6.25%	
2. Local Content	25%	Value of local content expenditure			6.25%
3. Ownership	15%	Black shareholding in the project company	3.75%		
		Black shareholding in the construction contractor	3.75%		
		Black shareholding in the operations contractor	3.75%		
		Local community shareholding in the project company		3.75%	
4. Management Control	5%	Black top management	5.00%		
5. Preferential Procurement	10%	BBBEE procurement expenditure	3.33%		
		SMME procurement expenditure			3.33%
		Women-owned vendor procurement expenditure			3.33%
6. Enterprise Development	5%	Community enterprise development contributions		5.00%	
7. Socio-econ. Development	15%	Community socio-economic development contributions		15.00%	
Totals			**32%**	**30%**	**38%**

Source: Authors' compilation, based on RSA, 2011-13.

Appendix 4: REIPPPP Economic Development Scoring Categories

		Onshore Wind* 1st Round Scoring	
Element	**Measurement**	**Threshold**	**Target**
1. Job Creation	SA-based employees who are citizen /number of SA-basedemployees	50%	80%
	SA-based employees who are black citizens/number of SA-based employees	30%	50%
	Skilled employees who are black citizens/number of SA-based	18%	30%
	SA-based employees who are citizens from local communities / number of SA-based	12%	20%
2. Local Content	Value of local content expenditure /total project value	25%	45%
3. Ownership	Shareholding by black people in the project company/total shareholding	12%	30%
	Shareholding by black people in the construction contractor/total shareholding	8%	20%
	Shareholding by black people in the operations contractor/total shareholding	8%	20%
	Shareholding by local communities in the project company/total shareholding	2.5%	5%
4. Management Control	Black top management/total size of top management	--	40%
5. Preferential Procurement	BBBEE procurement spend/total procurement spend	--	60%
	Qualifying SMME procurement spend/total procurement spend	--	10%
	Women-owned vendor procurement spend/total procurement spend	--	5%
6. Enterprise Development	Enterprise development contributions/revenue	--	0.6%
	Adjusted enterprise development contributions/revenue	--	0.6%
7. Socio-economic Development	Socio-economic development contributions/revenue	1%	1.5%
	Adjusted socio-economic development contributions/revenue	1%	1.5%

* All seven renewable energy categories have the same thresholds and targets except content – see Table X1.

Source: RSA, 2011-13

Appendix 5: REIPPPP Projects

Project Name	Technology	Contracted Capacity (MW)
Letsatsi Solar Photovoltaic Park	Photovoltaic Crystalline – Fixed	64.00
Lesedi Solar Photovoltaic Park	Photovoltaic Crystalline – Fixed	64.00
Witkop Solar Park	Photovoltaic Crystalline – Single Axis	30.00
Nobelsfontein Phase 1	Onshore Wind	75.00
Touwsrivier Solar Park	Photovoltaic Crystalline – Dual Axis	36.00
Dorper Wind Farm	Onshore Wind	97.53
Soutpan Solar Park	Photovoltaic Crystalline – Single Axis	28.00
Mulilo Solar PV De Aar	Photovoltaic Crystalline – Fixed	10.00
Mulilo Solar PV Prieska	Photovoltaic Crystalline – Fixed	20.00
Kaxu Solar One	Concentrated Solar Power	100.00
Dassieklip Wind Energy Facility	Onshore Wind	27.00
Konkoonsies Solar Energy Facility	Photovoltaic Crystalline – Fixed	9.65
Metrowind Van Stadens Wind Farm	Onshore Wind	27.00
Kouga Red Cap Wind Farm - Oyster Bay	Onshore Wind	80.00
RustMo1 Solar Farm	Photovoltaic Crystalline – Fixed	6.93
Kalkbult	Photovoltaic Crystalline – Fixed	72.50
Aries Solar Energy Facility	Photovoltaic Crystalline – Fixed	9.65
Slimsun Swartland Solar Park	Photovoltaic Crystalline – Fixed	5.00
Mainstream Renewable Power De Aar PV	Photovoltaic Crystalline – Fixed	45.60
Jeffreys Bay	Onshore Wind	138.00
Hopefield Wind Farm	Onshore Wind	65.40
Cookhouse Wind Farm	Onshore Wind	138.60
Greefspan PV Power Plant	Photovoltaic Crystalline – Single Axis	9.90
Kathu Solar Plant	Photovoltaic Crystalline – Single Axis	75.00
Solar Capital De Aar	Photovoltaic Thin Film – Fixed	75.00
Mainstream Renewable PowerDroogfontein	Photovoltaic Crystalline – Fixed	45.60
Herbert PV Power Plant	Photovoltaic Crystalline – Single Axis	19.98
Khi Solar One	Concentrated Solar Power	50.00
Bokpoort CSP project	Concentrated Solar Power	50.00
Gouda Wind Project	Onshore Wind	135.50
Solar Capital De Aar 3	Photovoltaic Thin Film – Fixed	75.00
Sishen Solar Facility	Photovoltaic Crystalline – Single Axis	74.00

Appendix 5: REIPPPP Projects *(continued)*

Project Name	Technology	Contracted Capacity (MW)
Amakhala Wind Project	Onshore Wind	133.70
Tsitsikamma Community Wind Farm	Onshore Wind	94.80
Wind Farm West Coast 1	Onshore Wind	90.82
Waainek Wind Power	Onshore Wind	23.28
Grassridge Onshore Wind Project	Onshore Wind	59.80
Chaba Wind Power	Onshore Wind	21.00
Aurora-Rietvlei Solar Power	Photovoltaic Crystalline – Fixed	9.00
Vredendal Solar Park	Photovoltaic Crystalline – Fixed	8.82
Stortemelk Power Plant	Small Hydro	4.40
Linde	Photovoltaic Crystalline – Single Axis	36.80
Dreunberg	Photovoltaic Crystalline – Single Axis	69.60
Jasper Power Company	Photovoltaic Crystalline – Fixed	75.00
Boshoff Solar Park	Photovoltaic Crystalline – Single Axis	60.00
Upington Airport	Photovoltaic Thin Film – Fixed	8.90
Neusberg Hydro Electrical Project	Small Hydro	10.00
Mkuze	Biomass	16.50
Ilanga CSP 1 / Karoshoek Solar One	Concentrated Solar Power	100.00
!XiNa Solar One	Concentrated Solar Power	100.00
Joburg Landfill Gas to Electricity	Landfill Gas	18.00
Longyuan Mulilo Green Energy De Aar 2 North Wind	Onshore Wind	138.96
Longyuan Mulilo De Aar Maanhaarberg Wind Energy	Onshore Wind	96.48
Nojoli Wind Farm	Onshore Wind	86.60
Loeriesfontein 2	Onshore Wind	138.23
Noupoort	Onshore Wind	79.05
Khobab Wind	Onshore Wind	137.74
Red Cap - Gibson Bay	Onshore Wind	110.00
Adams Solar PV 2	Photovoltaic Crystalline – Fixed	75.00
Electra Capital (Pty) Ltd	Photovoltaic Crystalline – Fixed	75.00
Mulilo Sonnedix Prieska PV	Photovoltaic Crystalline – Fixed	75.00
Mulilo Prieska PV	Photovoltaic Crystalline – Single Axis	75.00
Tom Burke Solar Park	Photovoltaic Thin Film – Fixed	60.00
Pulida Solar Park	Photovoltaic Thin Film – Fixed	75.00

Source: Authors' compilation. based on DOE data.

ENABLING INFRASTRUCTURE INVESTMENT

PPIAF is a multi-donor trust fund that provides technical assistance to governments in developing countries to develop enabling environments and to facilitate private investment in infrastructure. Our aim is to build transformational partnerships to enable us to create a greater impact in achieving our goal.