

OPEN CLIMATE NETWORK CASE STUDIES IN CLIMATE/LOW CARBON POLICY IMPLEMENTATION: SOUTH AFRICA'S RENEWABLE ENERGY INDEPENDENT POWER PRODUCER PROGRAM

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Acronyms

CCGT	Combined cycle gas turbine
CSP	Concentrated solar power
DEA	Department of Environmental Affairs
DEcoDev	Department of Economic Development
DoE	Department of Energy
IPP	Independent Power Producer
IRP	Integrated Resource Plan
NCCRWP	National Climate Change Response Strategy
NERSA	National Energy Regulator of South Africa
NT	Department of National Treasury
OCGT	Open cycle gas turbine
OCN	Open Climate Network
PPA	Purchase Power Agreement
PV	Solar voltaic power
REFIT	Renewable energy feed-in tariff
REIPPPP	Renewable Energy Independent Power Producers Programme

Background

In December 2009, President Zuma committed South Africa to climate mitigation actions that will collectively result in a 34% deviation below its business-as-usual emissions growth trajectory by 2020, and then 42% by 2025.¹ This mitigation goal would enable South Africa's GHG emissions to peak between 2020 and 2025, plateau for approximately a decade, and decline in absolute terms thereafter. To reach this target, South Africa's National Climate Change Response White Paper (NCCRWP) seeks to scale up the development and update of renewable energy (DEA 2011a).

The nation's Department of Energy (DoE) is responsible for implementing RE policies and measures. The DoE adopted an integrated approach to renewable energy by embedding RE targets into the larger national plan for electricity supply – the Integrated Resource Plan 2010 (IRP2010)². The IRP2010 lays out a vision of South Africa's energy mix from 2010-2030, with explicit milestones for bringing various forms of energy supply on-line. The IRP stipulates that by 2030 9 % of electrical energy supply have to be generated from renewable energy (RE)³.

The IRP2010 sets forth concrete targets for additional new generation capacity until 2030 including renewable energy. These targets translate into new capacity of 8400 MW on-shore wind, 8400 MW solar PV and 1000 MW solar CSP:

Table 1: Energy generation share as per the IRP2010

Energy generation technology	Current	IRP2010 plan for 2030
Coal	90%	65%
Nuclear	5%	20%
Hydro	5%	5%
Gas (combined cycle gas turbine)	0%	1%
Peak (open cycle gas turbine)	<0.1%	<0.1%
Renewables – incl. concentrated solar power (CSP), solar photovoltaic (PV), and wind	0%	9%

The flagship programme for implementing these targets set in the IRP2010 is the Renewable Energy Independent Power Producers Procurement Programme (REIPPPP), a procurement programme tasked with deploying 3,725 MW of renewable energy by 2016 (DoE 2012a). South Africa's DoE, National Energy Regulator (NERSA), and state-owned utility ESKOM jointly launched the REIPPPP in 2011.

The REIPPPP succeeded considerations for a Renewable Energy Feed-in Tariff (REFIT) explicitly laid out in

The Electricity Regulations on New Generation Capacity promulgated in August 2009 by the DoE (DoE 2009). In early 2011 it emerged that Government considers dropping the REFIT programme in favour of a competitive bidding process (Creamer 2011). The new Electricity Regulations on New Generation

¹ <http://www.thepresidency.gov.za/president/pr/2009/pr12061648.htm>

² http://www.energy.gov.za/files/irp_frame.html

³ Solar PV, Concentrated Solar Power (CSP) and on-shore wind.

Capacity, which were promulgated in May 2011, omitted all previous mention of a REFIT (Tait 2012). REFIT was never operationalized and finally abandoned in favour of the REIPPPP. The South African government argued that the REFIT was non-competitive and illegal in light of South Africa's procurement legislation (Diemont et al 2011; Tait 2012; DoE 2011c)⁴.

The Department of Economic Development's New Growth Path (DEcoDev 2011) is also aligned with the NCCRWP. The New Growth Path identifies renewable energy as a green growth sector. The stated goal of both the DoE and the Department of Economic Development is to create a sustainable RE sector within the South African economy that includes manufacturing and job creation.

About the assessment

During 2012 to 2013, The Electricity Governance Initiative of South Africa (EGI-SA)⁵ assessed the REIPPPP process using an analytic framework developed by the [Open Climate Network](#) (OCN), a global network of independent research institutes and civil society working to monitor countries' progress on climate change. Convened by the World Resources Institute, OCN seeks to accelerate the transition to a low-emission, climate-resilient future by providing consistent and credible information that enhances accountability both between and within countries. For this project, OCN worked in conjunction with WRI's Measurement and Performance Tracking Project (MAPT).

OCN designed the Climate Policy Implementation Toolkit⁶ to support an in-depth assessment of the institutional factors on which effective climate policy implementation depends.⁷ The diagnostic tool is organised around a framework of four key "functions" that are essential to policy implementation and five "principles" of good governance (Box 1).

Box 1. Climate Policy Implementation Toolkit

Key Functions

- Finance
- Policy Administration
- Monitoring and Reporting
- Compliance and Enforcement

Principles of Good Governance

- Role and Responsibility
- Institutional Capacity Building
- Transparency
- Stakeholder Engagement
- Policy Coordination

⁴ A REFIT provides renewable energy suppliers with pre-determined fixed tariff for the renewable energy they supply, whereas the bidding process that was eventually implemented is priced by the lowest prices offered by suppliers (with additional criteria).

⁵ [The Electricity Governance Initiative \(EGI\)](#) is a unique network of civil society organizations dedicated to promoting transparent, inclusive and accountable decision-making in the electricity sector. EGI currently has partners in 11 countries around the globe, including South Africa. EGI is coordinated by the Institutions and Governance Program at the World Resources Institute.

⁶ The pilot version of the toolkit may be obtained from Taryn Fransen: tfransen@wri.org

⁷ The Policy Implementation Toolkit is one of a suite of interrelated tools being developed by WRI to assess policy implementation. Other tools include the (i) Policy Tracking Tool intended to provide an overview of progress towards implementation of policies that are key to reducing GHG emissions or promoting low carbon development in a given country and (ii) the GHG Protocol Standard for Policy/Action Accounting and Reporting can measure the emissions impacts of policies after they have been implemented.

EGI-SA piloted the OCN diagnostic framework in 2012 to assess progress in REIPPPP's implementation so far. The research team drew on publically available information, performance review processes, and semi-structured interviews with key stakeholders from the DoE, National Treasury, NERSA, and RE industry representatives.

Finance and policy administration emerged as the OCN framework key functions that are the most challenging in REIPPPP implementation (see Box 1).

Evaluation of REIPPPP bids

The REIPPPP was envisaged to be implemented in 5 bidding windows over 2 years (Table 2).

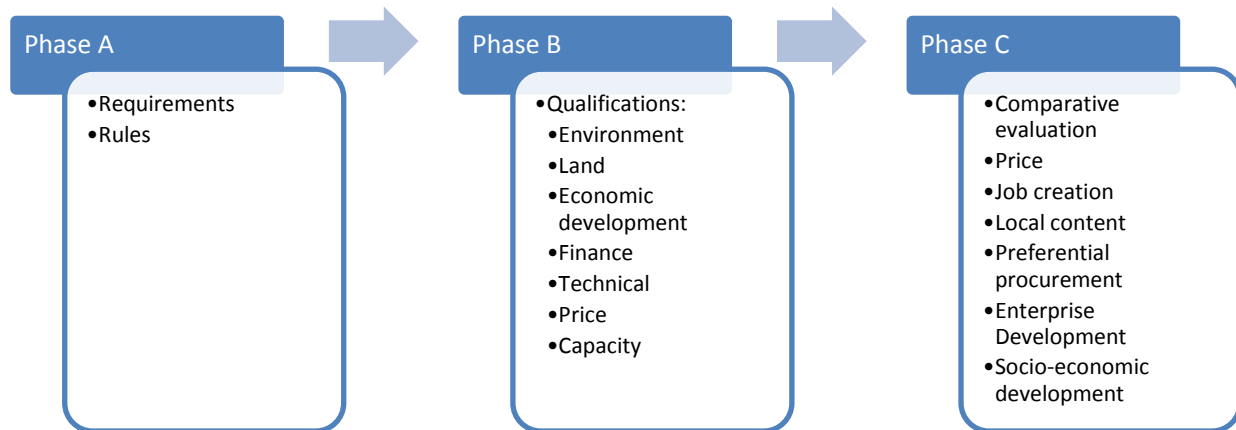
Table 2. Envisaged timetable for REIPPPP⁸

	Original RFP date (DoE 2011)	Updated RFP date (DoE 2012)	Capacity - MW (DoE 2012)
Window 1	4 November 2011	4 November 2011	1,415.52
Window 2	25 November 2011	5 March 2011	1,043.9
Window 3	14 May 2012	19 August 2013	1,265.6 (remaining allocations from the 3,725 MW target of the REIPPPP)
Window 4	29 October 2012	-	
Window 5	13 May 2013	-	

The designers of the REIPPPP bid evaluation created a phased process. All bids for each window were to be assessed in this phased approach (Table 3). Phase A ensured that all bids had met the specified criteria, for example, submitted relevant permits and financial information. Phase B then assessed bids on their ability to meet various technical requirements; decisions were made based on price. Phase C assessed all bids that had met the price barrier (under a ceiling price), and the bids were then evaluated on their commitment to job creation and socio-economic development. See Figure 1.

⁸ Source: <http://www.ipprenewables.co.za/>

Figure 1: Procurement evaluation methodology for Window 1 – Request for Proposal (RFP)



Adapted from DoE briefing to Parliament, 7 June 2012

The REIPPPP was designed with the aim of stimulating local economic development in the communities nearby large scale renewable energy installations as procured through the programme. The anticipated benefits to communities are outlined in Table 3. Requests for bids were issued on 4th August 2011 and 28 of the 53 bids were announced as preferred bidders on 7th December 2011.

Table 3: Description of economic development requirements with respect to local communities⁹

Element	Requirements	Description
Shareholding by local community	2.5% – 5% of project shareholding	The defined local community will have an ownership share in the project company. There are no explicit requirements on how these contributions should be spent, but would probably need to be developmental in nature.
Employment	12% - 20% of South African employees	This requirement requires that a percentage of the South African employees in the project should come from the local community.
Enterprise development	0 – 0.6% of project revenue	Enterprise development refers to contributions to black-owned businesses with the specific objective of assisting or accelerating the development, sustainability and ultimate financial and operational independence of that enterprise.
Socio-economic development	1 – 1.5% of project revenue	These contributions should be directed towards activities that facilitate sustainable access to the economy for beneficiaries. These contributions can go towards a wide range of activities including rural development, the environment, infrastructure, enterprises, reconstruction of underdeveloped areas, development programmes for women or youth, education, health care as well as arts and culture and sports.

⁹ From part C of the phased assessment REIPPPP Request for Proposals document.

REIPPPP progress to date

At the time this paper was finalised, there were no completed REIPPPP projects delivering electricity into the grid. However, this report's objective is to assess the implementation of the REIPPPP from its early stages, in order to capture lessons learned as the process is rolled out.

After two years of delays culminating in the abandonment of REFIT, the DoE was keen to fast track its new REIPPPP programme. In certain respects, the programme is successful. The DoE planners envisaged REIPPPP to be implemented in 5 bidding windows over 2 years, launching the first call for bids in August 2011. Appendix A shows the planned implementation schedule taken from IRP2010 for new energy generation including renewables. Between 2011 and 2016, 2500 MW of newly-built solar PV, wind, and solar CSP technologies should come onto the grid.

The DoE received 53 bids in November 2011 for the first window and 79 bids in March 2012 for the second window. By 2012, already 2459 MW had been procured, theoretically implying that the DoE nearly reached its RE allocation goal for 2016 (see Table 2). For this reason, no further windows have been implemented after the second window. The third window deadline has been delayed until August 2013.

The competitive bidding approach appears to have taken advantage of the rapid drop in global prices of RE technologies. In the first REIPPPP window, bid prices were close to or just under the ceiling price. In the time between the first and second windows, global prices dropped and bidders were able to come in at considerably lower costs compared to the first window, as illustrated by Table 4.

Table 4: Decrease in prices (ZAR/MWh) from Window 1 to Window 2 under REIPPPP (Fakir 2012)

Technology	Indicative ceiling price	1 st Round Average	2 nd Round Average	Difference
Solar Photovoltaic	R 2 850.00	R 2 662.00	R 1 993.20	-25.1%
Onshore Wind	R 1 050.00	R 1 134.00	R 1 050.30	-11.3%
Small Hydro	R 1 030.00	R 1 030.00	R 1 030.00	0.0%
Concentrated Solar Power	R 2 850.00	R 2 686.00	R 2 512.00	-6.5%
Landfill Gas	R 840.00		R 840.00	

In important respects, REIPPPP succeeded in fast-tracking the roll out of RE procurement. Yet each of these dimensions – the fast-track scale up, a linkage to the IRP, and job creation criteria – presented implementation challenges from the beginning. In the next sections we examine these challenges in turn and analyse the governance gaps that underpin them.

Ambition and its challenges: lessons from the road to implementation

The pitfalls of the fast-track: capacity is crucial

By its own admission, the very success of the first bidding window is what overwhelmed the DoE, and it was unable to finalize any Purchase Power Agreements (PPAs) within the announced timeframe.¹⁰

Despite DoE specifying a target date of June 2012, the first window bids only reached financial closure in November 2012. Financial closure for window 2 was also postponed from December 2012 to March 2013. A third bidding round submission date, originally scheduled for October 2012, has been postponed until August 2013.

Investors expressed apprehension about the uncertainty of time to completion and some indicated that the delays would force a withdrawal of bids. For example, in a multi-stakeholder meeting hosted by the national parliamentary portfolio committee on energy, a wind turbine manufacturer expressed the possibility of closing its doors at the end of 2012, apparently due to delays in the roll out of renewable energy.¹¹

In October 2012, the Budgetary Review and Recommendation Report (BRRR) process highlighted delays in various energy related programmes.¹² In its progress report presented to Parliament, the DoE painted the picture of a department trying to deliver a number of key energy services but with limited institutional capacity. DoE acknowledged that there were delays in the finalization of the first successful bids, due to a lack of experience with such processes and a lack of capacity to finalise the contracts.¹³ In turn, the Presidency's Department of Performance Monitoring and Evaluation commented that the objective of creating a regulatory institutional framework for the introduction of viable Independent Power Producers (IPPs) was behind schedule.¹⁴ The Department of Energy Annual Report 2012 (DoE 2012a) identifies capacity constraints as contributing to deferment of some key performance areas. DoE has relied on external consultants and expertise from treasury in both the design and implementation of the REIPPPP.

How can this lack of capacity at the DoE be explained? This OCN assessment revealed weaknesses in the key areas of budgetary support (including resourcing and prioritization of the RE programme) and shifting roles and responsibilities.

Budgetary Support

The assessment revealed that there is lack of sufficient technical capacity at the DoE commensurate with the needs of managing a significant RE procurement programme. The human resources needed to

¹⁰ Portfolio Committee BRRR meeting, October 2012

¹¹ Parliamentary stakeholder meeting, 30th August 2012

¹² <http://www.pmg.org.za/files/doc/2012/121029pcenergybrrr.htm>

¹³ Portfolio Committee BRRR meeting, October 2012

¹⁴ These reports are consistent with an earlier governance assessment released by EGI SA in 2009, which found weak capacity in the Energy Directorate of what was then the Department of Minerals and Energy:

[http://electricitygovernance.wri.org/files/egi/EGI-SA%20report%20-%20The%20Governance%20of%20Power%20\(Feb2010\)-cover.pdf](http://electricitygovernance.wri.org/files/egi/EGI-SA%20report%20-%20The%20Governance%20of%20Power%20(Feb2010)-cover.pdf)

select, negotiate, and conclude investments of an estimated R100 billion¹⁵ of projects is not trivial¹⁶ – but the newly formed stand-alone Department of Energy is not yet fully staffed and gaps are particularly evident in the RE programme.

Because of resource constraints, the DoE has been operating in an interim structure since 2010 with the branches pertaining to clean energy and energy planning embedded in remnant line functions from the now defunct Department of Minerals and Energy (DoE 2012a). Only as a result of the strategic review at the end of 2012– well after the launch of REIPPPP – was this structure revised to align with climate change and alternative energy strategies, making clean energy a branch in its own right. Further, the estimated R4 million of IPP unit set-up costs has only recently been approved.

Some indications suggest that the biggest problem affecting the REIPPPP programme is not that the DoE is underfunded, but that the programme has not been prioritised. The DoE budget for 2013 does not indicate a discernible plan to prioritise the development of institutional know-how for RE procurement and planning¹⁷. According to the budget, less than 5% of a three-year expenditure of renewables programme of R405 million, will be spent on RE programme implementation. There are only six funded posts for the renewable sub-programme (including all technologies e.g., solar, wind, biogas, small scale, large scale) with an additional three to be added for 2013 and no further increase in personnel over the following three years (NT 2013).

This slim capacity can be measured in contrast to DoE's original commitment to an electricity plan that stipulated 42% of newly built electricity come from RE sources. The total new build projected for renewables by 2030 is 17.8GW, with (at the time of research) only nine people in the department to implement. To give context, the department's nuclear programme had 21 people to implement only 9.6GW. The lion's share of expenditure estimates for the RE sub-programme over the next three years has been allocated to the National Energy Development Institute to research and development related to carbon capture and hydraulic fracturing. This leaves less than 5% for building institutional capacity at DoE.

As a result of the findings of 2012 Budgetary Review and Recommendation Report (BRRR), Parliament stated its interest in keeping a close eye on both the Treasury's and DoE's commitment to building the department's institutional capacity to develop a robust RE programme.

Now that the DoE has some experience with the scale of its REIPPPP programme, it would be constructive for the DoE to quantify more precisely the technical capacity needed for a more effective implementation. Parliament can play an important role in tracking the progress of plans to meet staffing needs at DoE.

¹⁵ <http://www.ipprenewables.co.za/#page/303>

¹⁶ Trollip, Hilton and Marquard, Andrew. *Analysis: Prospects for Renewable Energy in South Africa*, n.d. Heinrich Boll Foundation. <http://www.za.boell.org/web/climate-change-614.html>

¹⁷ 2013 budget speech: <http://www.info.gov.za/speech/DynamicAction?pageid=461&tid=107017>

Shifting roles and responsibilities

The DoE's lack of capacity must also be understood in the context of shifting leadership of the RE procurement programme. Under the REFIT process (see Box 2), NERSA took the lead role in designing the feed-in tariff in accordance with 2009 new generation regulations, and was expected to also manage the procurement process. However, new regulations were promulgated on 4th May 2011 that superseded and replaced the previous regulations (Diemont et al. 2012). When the new regulations replaced feed-in tariffs with the Independent Power Producers programme, it was decided that the new programme would be led by the DoE rather than NERSA.

Table 5: Shift in roles and responsibilities of DoE and NERSA for RE procurement programmes

	REFIT: 2008- 2011	REIPPPP: 2011- present
NERSA	• Designs REFIT guidelines • Consulted with public • Published for implementation • Reviewed with public input • Not implemented	• Licensed IPPs with public consultation
DoE	• Redrafted law on new generation (which excluded REFIT)	• Designed REIPPPP with Treasury and consultants • Implemented REIPPPP

The sudden shift in responsibility from NERSA (under the REFIT programme) to the DoE (under REFIT/REIPPPP) could help explain why the DoE has been under-prepared for its role. The DoE's Annual Report for 2010/2011 lacks any mention of REIPPPP, revealing that the shift was unanticipated and not reflected in the budget or staffing patterns.

The RE department – leaderless and apparently working with a bare-bones staff – was handed responsibility for an ambitious programme with little time to acquire the requisite skills and experience it needed to evaluate PPAs or implement basic governance measures¹⁸.

The shifting of responsibility from NERSA to the DoE also underscores the lack of clarity in the respective roles of the Minister and regulatory body. According to Section 34 of the Electricity Regulation Act (RSA 2006, RSA 2008), the Minister has the prerogative to assume the role of concluding PPAs. However, criteria defining when the Minister might execute this responsibility are lacking.

The lack of clarity about the power of the Minister also has bearing on the coordination of the REIPPPP programme with the IRP. We explore this in the next section.

¹⁸ The full OCN policy implementation assessment report (2012) goes into greater detail about the governance gaps in the development and roll out of REIPPPP. For example, there was no public explanation for the shift from REFIT to REIPPPP, and whereas the REFIT development had been a fairly transparent and consultative process, the REIPPPP process was closed, run by DoE, with the support of Treasury and private consultants. Even once the REIPPPP process had been finalized, procurement documents were still not publically available. The report is available from Liz McDaid: liziwe@mweb.co.za

Linkages to the IRP: Flexibility is key

The IRP lays out a vision of South Africa's energy mix over the next 20 years, with explicit milestones for bringing various forms of energy supply on-line.

The IRP exemplifies that even the best laid plans tend to go awry. If the DoE manages to conclude the PPAs with all successful bidders through the REIPPPP programme, the IRP target for RE capacity by 2017 would already have been reached by 2013. Essentially, three years of the long-term plan will have been telescoped into one. Although this appears to be positive progress, the regulator is not authorized to license any power plants that are not envisioned within the parameters of the IRP – meaning that no further RE capacity can be licensed until the IRP is revised.

The restriction on the amount of renewable energy to be deployed by 2017 was designed to take advantage of the RE price decreases as the market matures. However, those in favour of creating a manufacturing or industrial sector criticise the imposition of a “cap” on RE procurement, as it jeopardises the stable market in which industry requires to thrive. A lengthy moratorium would be disruptive to the industry, sending uncertain signals to the market, undermining investor confidence and weakening job creation efforts. Adjusting the target so that the procurement programme can continue without interruption would require a review of the IRP.

Yet the DoE, already burdened by the oversubscription of RE bidding, does not appear to have the capacity to undertake this task. The IRP2010 was initially mandated to be reviewed in 2012, was delayed until 2013, and is now rescheduled for 2014. Combined with the delays in finalising contracts described above, the prospect of the REIPPPP shutting down until 2017 was discouraging to investors, and increased scepticism about renewable energy domestically. If not expeditiously addressed, the entire approach to renewables in the IRP could be placed in jeopardy.

To mitigate these threats, the Minister has sought to use her authority to override the cap on renewable energies, so that the REIPPPP programme might continue even in the absence of the IRP review. Yet, bypassing a full review of the IRP risks creating new hazards, including the commission of unnecessary coal-fired power plants and possibly the premature scaling up of RE technology.

The key to flexibility is not expanding executive authority, but building the capacity for rapid review into the IRP process. A nimble system is required, one that recognises the rapidly-evolving RE market and takes a holistic approach to procurement planning. The current IRP appears to have taken a cautious – even sceptical – approach to RE potential. It is possible that initial assumptions were too conservative; yet it is also possible that contracting for more RE power immediately is a hasty decision. After all, no renewable energy has yet been integrated into the grid and assessing its impacts has not been possible. A review of both the IRP and the REIPPPP is necessary to intelligently consider these issues.

The need for flexibility thus raises two related issues: a capacity issue and a governance issue. The need to ramp up technical capacity at the DoE has been noted above. But the use of executive authority to override procedures is a potentially serious governance issue. In 2012, the government initiated a change in the Electricity Regulation Act in order to address the lack of clarity in respect to the role of the

Minister and the regulator. This has not yet been finalized. One of the current challenges is balancing the authority of the Minister with the due diligence often delegated to the regulator. Clarity around the respective roles of NERSA and the DoE would provide guidance for the substantive and procedural capacity that needs to be built at each institution.

The following processes could help ensure that the IRP is flexible and responsive to market signals:

- Planning resources for more frequent policy reviews, including budgetary resources, technical capacity, and capacity for stakeholder engagement
- Monitoring global RE sectors on an ongoing basis
- Benchmarking deployment strategies and policies
- Clarifying the respective roles of the Minister and the regulator, including criteria that govern when the Minister may override existing procedures

Linkages to the New Growth Plan: Where are the jobs and community benefits?

Jobs and economic development

Unemployment is a serious issue afflicting South Africans. According to the 2011 census¹⁹, 29-40% of South Africans of employable age are unemployed, with the majority under 35 years old. The condition to employ 12-20% of local South Africans in RE projects procured through REIPPPP is seen as key to encouraging local development.

The Department of Economic Development's New Growth Path identified renewable energy as a green growth sector, and the stated goal of both the DoE and the Department of Economic Development is to create a sustainable RE sector within the South African economy that includes manufacturing and job creation.

Job creation can be considered as a positive externality of a technology, which is partly recognised in the REIPPPP tender documentation. The REIPPPP contains localisation criteria and specific criteria for local economic development that includes local ownership and prescribes financial expenditure within a 50km radius of a given project site.

On 5 November 2012, the DoE released a fact sheet on potential jobs that would be created in Window 1 of the REIPPPP. Bidders were asked to propose the jobs in both construction and operation that their project, if successful, would yield. According to the DoE's figures drawn from successful bids, the first window would create a total 23 883 jobs – 13 069 in construction and 10 814 in operations (DoE 2012b), but only 463 jobs would go to South Africans for operations, which are considered longer term and more valuable than construction jobs²⁰.

¹⁹ <https://www.statssa.gov.za/census2011/default.asp>

²⁰ Such a reliance on foreigners for electricity power plant operations and maintenance is not unusual. For example, Alstom was contracted for a major maintenance contract in 2010 and brought in 110 specialists from Europe: <http://www.engineeringnews.co.za/article/alstom-mobilising-for-big-koeberg-unit-1-shutdown-2010-07-30>

This implies little long-term benefit for South Africans and almost all (96%) of the operational wage bill would be repatriated. International research indicates an even lower number of jobs to be created on the operational side. For example, figures provided by the Electric Power Research Institute indicate only 23 operations and maintenance jobs are needed for 250MW of installed capacity solar PV. Extrapolating to the first bidding window, the equivalent would equal only 70 jobs (EPRI 2010). A study by the US National Renewable Energy Laboratory on concentrated solar power indicates South Africa's first window would yield roughly 210 operations and maintenance jobs for RE (NREL 2004).

The debate about the job figures raises questions of both methodology and strategic thinking around the job creation potential of the RE sector. It has been noted that the job creation obligation was not well defined in the bid documents. Said one developer: "Where do you stop counting jobs? Every party we meet has a different view on the boundary – is it at the edge of the site, is it at the edge of the primary contractors, do you go down to subcontractors?"²¹ The distinctions between direct and indirect jobs – and the assumptions underlying each – have not been well defined.

While soliciting bids from project developers is essential for bottom-up input, there is a need for a larger top-down strategy for creating jobs in this sector - one that is informed by an analysis of the RE value chain. A few recommendations are outlined below.

The first step in such an analysis should be for decision-makers to recognise that jobs lie across a cross-section of activities along the entire value chain, and then apply analytic techniques to account for each of them. New technologies considered for introduction into an economy should match the local skills base. Emerging literature, both international and local (Mulcahey 2012, Weisegart et al. 2011), outlines solar PV and on-shore wind value chains that could be used to construct a preliminary high-level view of where jobs lie (Barua et al. 2012). These include breaking down the technology-specific value chain into key segments such as: R&D, key materials manufacturing, components manufacturing, development and installation services (e.g., system design; site assessments; construction, financing, operations and maintenance).

The second step would be to analyse the value chain in terms of South Africa's competitiveness. If components are already being cheaply produced and imported from abroad, there is a danger that requiring local manufacturing will make RE technologies more expensive for South Africa. For example, if solar panels can be sourced from the deeply-subsidised and highly-automated Chinese industry, producing labour intensive panels domestically might not be cost effective for South Africa. But a full manufacturing analysis may reveal that there are parts other than panels – such as mounting structures or inverters - that the industry might find attractive to source locally. In either case, the cost (and hence attractiveness) of localising manufacturing would depend both on the advantages offered by the existing manufacturing base and on the size of the market that a local industry could produce for. It is not clear whether the size of the South African market, or even a regional market where competitors already abound, would be sufficient to draw production lines.

²¹ Mark Pickering, adviser to Globeleq SA, which is involved in the development of four first-round REIPPPP projects.
<http://www.engineeringnews.co.za/article/simpler-bid-documents-dialogue-sessions-could-streamline-reipp-process-2012-10-23#.USQHhsdA0s8.email>

Once the jobs potential is evaluated by number of jobs and competitiveness, the third step would be to determine where in the value chain necessary skills are missing, and how they might they be created. For example, developing a manufacturing base would require engineering skills, while assembly and installation (of already manufactured parts) would require a different set of skills. These downstream jobs might be more labor intensive and relatively easy to train for. On the other hand, developing a competitive edge might entail creating a robust R&D programme that requires a priority focus from multiple training institutes to support it. At the 2012 NERSA IPP licensing hearings, at least one IPP proposed to partner with a tertiary institution to foster technical skills in the local community. Such an approach could usefully be considered as part of the criteria for further energy procurement (NERSA 2012).

The debate about the relationship between low cost and job creation objectives is highly charged around the world. Analytic work in the context of South Africa's potential competitiveness could shed light on where job creation and local content requirements might enhance, rather than undermine, other objectives of the REIPPPP programme. Alternatively, if objectives are found to be at odds with one another, such analysis could spur an informed and transparent debate about trade-offs that might need to be made.

The research programme that is now underway in preparation for the IEP and IRP review could incorporate these issues. This analysis would also be useful in shaping DoE's plans for supporting small scale renewable energies, which are intended to complement the REIPPPP's focus on large plants.

Community Benefits

Stakeholders have also raised a number of issues related to the challenge of realising community benefits. On 7 March 2013, the Energy Research Centre at the University of Cape Town held a workshop with various industry representatives, financial institutions, community development practitioners and NGOs. The workshop aimed to explore some of the challenges faced in implementing the REIPPPP programme roll-out. Participants identified key challenges including: time lags of several years between initiation of community involvement and any monetary benefits; difficulties with collaboration, identifying communities, overlap, etc.; and one unanimous grievance with DoE for failing to provide feedback on how the socio-economic aspects of the bid had been evaluated. It is noteworthy that the list of assessors who evaluated the REIPPPP bids did not include social scientists nor labour specialists, but only specialist lawyers and accountants (Audat 2012, DoE 2012). In addition, there was lack of clarity surrounding the role municipalities should play and divergent interpretations of stakeholder roles and responsibilities (ERC 2013).

Recommendations for addressing these challenges include:

- Including community benefit specialists in the REIPPPP design and evaluation team
- Identifying appropriate roles for REIPPPP project developers vs. other implementing bodies
- Identifying early benefits for communities
- Involving communities directly in the conceptualization and planning stages

Implications of implementation barriers for review processes

The implementation barriers captured in this case study suggest research questions that both the legislature (Parliamentary BRRR process) and executive can usefully incorporate into existing review mechanisms. Of the executive review mechanisms, Minister Dipuo Peters'²² Performance Agreement could play an especially important role. The Performance Agreement measures DoE's and NERSA's contributions towards achieving 12 national outcomes. Of particular relevance to REIPPPP is National Outcome #4: decent employment through inclusive economic growth. Integrating the following questions into on-going review programmes would accelerate South Africa's ability to overcome REIPPPP implementation barriers, would improve the country's chances of reaching RE targets, and would maximise impact on South Africans. In addition, governance gaps and issues of global interest have been identified.

Recommended research agendas for legislative and executive review mechanisms

Budgetary needs and priorities at the DoE

The BRRR and related parliamentary activities revealed delays in many DoE programmes related to clean energy, including the REIPPPP. Specific challenges that parliament now plans to address include the reported under-resourcing of the DoE and lack of prioritization of the RE programme.

As parliament takes up the issue, it will be important to learn in more detail about:

- The existing budget for the REIPPPP and IRP functions, as a percentage of the DoE budget overall;
- Existing staffing of the DoE, including unfilled positions; and
- The decision-making process for prioritization of budget allocations within the department

Institutional capacity

More research is required to understand what capacities are needed for the DoE to realise the vision that has been set forth, e.g., benchmarking the quantum of:

- Technical capacity to bring contracts with independent power producers to financial closure;
- Technical capacity for rapid review of the integrated resource plan, in order to accommodate the evolving RE market;
- Analytic capacity to evaluate the jobs potential and competitiveness along the RE value chain; and
- Human resource capacity for improving stakeholder engagement and monitoring of socio-economic impacts

²² Minister Peters was replaced by Minister Ben Martins in July 2013.

Strategic analysis for socio-economic development goals

There is currently insufficient strategic analysis to ground the job creation and socio-economic development goals of the REIPPPP programme. These goals need to be underpinned by a:

- Strategic assessment of the economic niche that South Africa could occupy in the global RE industry.; and
- More granular analysis that segments the number of jobs along the value chain, skills required, and training needs, which would be helpful in promoting the type of accountability that the performance agreement strives for.
- Externalities accounting which evaluates technologies on the basis of social benefits such as job creation and local economy beneficiation

Governance Gaps

The assessment identified governance gaps that would need to be addressed. These include:

- Improving procedures for rapid review of the IRP and REIPPPP programmes;
- Clarifying the respective roles and authorities of the ministry and regulatory body; and
- Strengthening transparency and stakeholder engagement (particularly affected communities and local government) around bidding criteria, especially socio-economic criteria.

Issues of interest for the international RE community

More generally, the case study raises three issues that are of interest to the international community as it seeks to better understand RE policy mechanisms and implementation. The issues are laid out in the following questions.

- 1) How will competitive bidding play out on the ground?

Has the market matured enough for competitive bidding to deliver, or are feed-in tariffs still the procurement mechanism of choice? Although competitive bidding promises to lower costs, experience shows that projects aren't always able to deliver. China shifted its procurement mechanism for wind from competitive bidding to feed-in tariffs after windfarms that had underbid were unable to deliver power; and Brazilian wind projects were met with considerable scepticism as well (Weischer et al. 2011). Tracking REIPPPP's impact in South Africa will facilitate understanding of market mechanisms more broadly and help policy makers make more informed decisions on renewable energy.

- 2) How can consistent demand be maintained to nurture local manufacturing?

IRP2010's restriction on the amount of renewable energy until 2017 was designed to take advantage of the RE price decreases. However, developing a market relies on consistent demand, especially if there are localization requirements. Delays in procurement due to intermittent caps on renewable energy threaten to discourage investors seeking sustained revenues. A predictable demand resulting from a transparent and predictable procurement process is needed to support the local manufacturing goal.

South Africa's ability to create an energy planning process rather than a fixed and inflexible plan that can weigh these trade-offs in a transparent way will be key.

3) How can the potentially competing objectives of low cost and localization be managed?

Similarly, the twin goals of localised manufacturing and least-cost electricity are not necessarily compatible in the short run. Factoring in positive externalities, such as local job creation and negative externalities of fossil fuel technologies on the other hand can mitigate much of these competing objectives. South Africa's commitment to this issue could yield important analytic frameworks, data, and open decision-making processes that will be of more general interest.

Conclusion

The implementation of REIPPPP yielded some initial successes: the competitive bidding approach, which attracted ample investors while driving down the cost of RE technologies; and the licensing of South Africa's first REIPPs, expected to be in operation by 2016. The latter is a significant breakthrough, especially given the policy conflicts that stalled the REFIT programme and eventually led to its abandonment.

Since the roll out of the policy is in its early stages, it is still too soon to assess impact on the ground. Nevertheless, there are important lessons pertaining to the fast-tracking of the RE programme in general and the job creation and economic development objectives in particular.

Our study shows there are key gaps in implementation that need to be addressed as the REFIT programme continues. It is our hope that in doing so, implementation will be more effective and renewable energy will be advanced in a durable, equitable fashion.

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Appendices

Appendix A: IRP2010 as promulgated by DoE on 6th May 2011.

Table 3. Policy-Adjusted IRP

	Committed build												New build options									Total new build	Total system capacity	Peak demand (net sent-out) forecast	Demand Side Management
	RTS Capacity (coal)	Medupi (coal)	Kusile (coal)	Ingula (pumped storage)	DOE OCGT IPP (diesel)	Co-generation, own build	Wind	CSP	Landfill, hydro	Sare (wind)	Decommissioning	Coal (PF, FBC, imports)	Gas CCGT (natural gas)	OCGT (diesel)	Import Hydro	Wind	Solar PV	CSP	Nuclear						
	MW	MW	MW	MW	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	38885	252		
2011	679	0	0	0	0	130	0	0	0	0	0	0	0	0	0	0	0	0	0	809	45344	39956	494		
2012	303	0	0	0	0	0	300	0	100	100	0	0	0	0	0	0	300	0	0	1103	46447	40995	809		
2013	101	722	0	333	1020	0	400	0	25	0	0	0	0	0	0	0	300	0	0	2901	49348	42416	1310		
2014	0	722	0	999	0	0	0	100	0	0	0	500	0	0	0	400	300	0	0	3021	52369	43436	1966		
2015	0	1444	0	0	0	0	0	100	0	0	-180	500	0	0	0	400	300	0	0	2564	54933	44865	2594		
2016	0	722	0	0	0	0	0	0	0	0	-90	0	0	0	0	400	300	100	0	1432	56365	45786	3007		
2017	0	722	1446	0	0	0	0	0	0	0	0	0	0	0	0	400	300	100	0	2968	59333	47870	3420		
2018	0	0	723	0	0	0	0	0	0	0	0	0	0	0	0	400	300	100	0	1523	60856	49516	3420		
2019	0	0	1446	0	0	0	0	0	0	0	0	250	237	0	0	400	300	100	0	2733	63589	51233	3420		
2020	0	0	723	0	0	0	0	0	0	0	0	250	237	0	0	400	300	100	0	2010	65599	52719	3420		
2021	0	0	0	0	0	0	0	0	0	0	-75	250	237	0	0	400	300	100	0	1212	66811	54326	3420		
2022	0	0	0	0	0	0	0	0	0	0	-1870	250	0	805	1143	400	300	100	0	1128	67939	55734	3420		
2023	0	0	0	0	0	0	0	0	0	0	-2280	250	0	805	1183	400	300	100	1600	2358	70297	57097	3420		
2024	0	0	0	0	0	0	0	0	0	0	-909	250	0	0	283	800	300	100	1600	2424	72721	58340	3420		
2025	0	0	0	0	0	0	0	0	0	0	-1520	250	0	805	0	1600	1000	100	1600	3835	76556	60150	3420		
2026	0	0	0	0	0	0	0	0	0	0	0	1000	0	0	0	400	500	0	1600	3500	80056	61770	3420		
2027	0	0	0	0	0	0	0	0	0	0	0	250	0	0	0	1600	500	0	0	2350	82406	63404	3420		
2028	0	0	0	0	0	0	0	0	0	0	-2850	1000	474	690	0	0	500	0	1600	1414	83820	64867	3420		
2029	0	0	0	0	0	0	0	0	0	0	-1128	250	237	805	0	0	1000	0	1600	2764	86584	66460	3420		
2030	0	0	0	0	0	0	0	0	0	0	0	1000	948	0	0	0	1000	0	0	2948	89532	67809	3420		
TOTAL	1463	4332	4338	1332	1020	390	700	200	125	100	-10902	6250	2370	3910	2609	8400	8400	1000	9600	45637					

Table 4. Policy-Adjusted IRP capacity

	Total capacity		Capacity added (including committed) from 2010 to 2030		New (uncommitted) capacity options from 2010 to 2030	
	MW	%	MW	%	MW	%
Coal	41071	45.9	16383	29.0	6250	14.7
OCGT	7330	8.2	4930	8.7	3910	9.2
CCGT	2370	2.6	2370	4.2	2370	5.6
Pumped Storage	2912	3.3	1332	2.4	0	0.0
Nuclear	11400	12.7	9600	17.0	9600	22.6
Hydro	4759	5.3	2659	4.7	2609	6.1
Wind	9200	10.3	9200	16.3	8400	19.7
CSP	1200	1.3	1200	2.1	1000	2.4
PV	8400	9.4	8400	14.9	8400	19.7
Other	890	1.0	465	0.8	0	0.0
Total	89532		56539		42539	

Notes: (1) Committed generation capacity includes projects approved prior to IRP 2010 (refer to Table 3).

Appendix B: Facts Sheet: Window one REIPP Economic Development benefits, 05 November 2012²³

Facts sheet Window one REIPP Economic Development benefits 05 November 2012

Background

This information represents the commitments made by window one preferred bidders. The Department included these commitments in the implementation agreement for each preferred bidder. Each preferred bidder will be required to comply with its commitments and obligations, failing which, penalties will be applied which may lead to termination of the Power Purchase Agreement. The power purchase agreement will be in force for a period 20 years from the operation date.

Job creation

Job creation was a mandatory requirement in the Request for Proposals. All bidders were required to meet certain minimum thresholds and compete thereafter on additional jobs offered. The figures below outline the commitments made per technology during both construction and operation.

Total Jobs (Persons):

	Solar CSP Construction	Operations	Solar Photovoltaic Construction	Operations	Wind Construction	Operations
Eastern Cape	0.0	0.0	0.0	0.0	1196.3	1090.3
Free State	0.0	0.0	167.5	225.0	0.0	0.0
Limpopo	0.0	0.0	259.2	1480.0	0.0	0.0
Northern Cape	2353.7	1400.0	7540.6	3024.8	642.0	1040.0
North-West Province	0.0	0.0	307.8	780.7	0.0	0.0
Western Cape	0.0	0.0	403.4	1353.3	198.6	420.0
Total	2,354	1,400	8,679	6,864	2,037	2,550
					Construction	Operation
Grand Total					13,069	10,814

Table 1: Jobs created for South African Citizens

Province	Solar CSP		Solar Photovoltaic		Wind	
	Construction	Operations	Construction	Operations	Construction	Operations
Eastern Cape	0.0	0.0	0.0	0.0	1049.0	43.5
Free State	0.0	0.0	83.8	5.6	0.0	0.0
Limpopo	0.0	0.0	207.3	44.4	0.0	0.0
Northern Cape	1882.9	69.1	5451.0	133.3	642.0	52.0
North-West Province	0.0	0.0	228.6	35.0	0.0	0.0
Western Cape	0.0	0.0	380.2	64.9	167.4	15.6
Total	1,883	69	6,351	283	1,858	111
					Construction	Operation
Grand Total					10,092	463

²³ DoE, 2012b

Table 2: Jobs created for South African Black Citizens

Province	Solar CSP		Solar Photovoltaic		Wind	
	Construction	Operations	Construction	Operations	Construction	Operations
Eastern Cape	0.0	0.0	0.0	0.0	719.2	25.4
Free State	0.0	0.0	50.3	3.4	0.0	0.0
Limpopo	0.0	0.0	129.6	27.8	0.0	0.0
Northern Cape	1386.2	41.7	3095.5	95.9	541.5	40.0
North-West Province	0.0	0.0	141.1	26.4	0.0	0.0
Western Cape	0.0	0.0	209.9	29.9	108.2	7.6
Total	1,386	42	3,626	183	1,369	73
					Construction	Operation
Grand Total					6,381	298

Local content

Most jobs in the renewable energy space can be established in boosting local manufacturing. Therefore the programme outlines minimum requirements in terms of local content. The programme provides minimum thresholds per technology with regards to local content. It is our intention to gradually increase these thresholds in the subsequent windows. The table below gives an overview of money to be spent on local products during construction of the different renewable plants as procured in window one.

Table 3: Local content

Local Content:			
Rands		Average Value per MW	
Construction Period	Operations Period	Construction Period	Operations Period
11,472,384,725.00		7,854,569.85	

Table 4: QSE and EME Procurement

Value of Qualifying Small Entities and EMEs procurement:				Value of Women Owned Vendors procurement:			
Total Value (R):		Average Value per MW(R):		Total Value (R):		Average Value per MW(R):	
Construction Period	Operations Period	Construction Period	Operations Period	Construction Period	Operations Period	Construction Period	Operations Period
895,677,925.00	871,265,982.00	613,226.02	596,512.38	354,012,240.00	451,464,502.00	242,374.53	309,095.24

OPEN CLIMATE NETWORK CASE STUDIES IN CLIMATE/LOW CARBON POLICY IMPLEMENTATION

Enterprise Development

The department requires that each preferred bidder contributes towards enterprise development especially in communities located closer to the renewable plant. This can only be demonstrated through money spent during both construction and operation period. The table below outlines the amount of money to be spent during construction and operation of the renewable energy power plants.

Table 5: Enterprise Development

Enterprise Development											
Total Revenue (R'):		Average Revenue (R') per MW:		Value of Enterprise Development (R'):		Average value of Enterprise Development per MW (R'):		Adjusted Enterprise Development (R'):		Average Adjusted Enterprise Development Value per MW (R'):	
Construction Period	Operations Period	Construction Period	Operations Period	Construction Period	Operations Period	Construction Period	Operations Period	Construction Period	Operations Period	Construction Period	Operations Period
30,104,780.00	161,301,286,554.00	20,611.24	110,434,949.03	180,629.00	919,290,307.00	123.67	629,392.24	243,849.00	1,113,966,840.00	166.95	762,609.09

Social Economic Development

It is our requirement that at least 1 percent of the total revenue must be spent on social economic development. However, a bidder may spend more but not less than the 1 percent. See the table below for commitments on social economic development.

Table 6: Socio-Economic Development

Socio-Economic Development											
Total Revenue Value (R'):		Average Revenue Value per MW (R'):		Value of Socio-Economic Development Contribution (R'):		Average Value of Socio-Economic Development Contribution per MW (R'):		Value of Adjusted Socio-Economic Development Contribution (R'):		Average Value of Adjusted Socio-Economic Development Contribution per MW (R'):	
Construction Period	Operations Period	Construction Period	Operations Period	Construction Period	Operations Period	Construction Period	Operations Period	Construction Period	Operations Period	Construction Period	Operations Period
30,104,780.00	162,826,727,389.00	20,611.24	111,479,342.32	451,572.00	2,085,447,872.00	309.17	1,427,802.19	609,622.00	2,584,495,622.00	417.38	1,769,475.30

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Window One Preferred Bidders Analysis

	Allocation to Preferred Bidders: Window 1	MW allocation per Determination
	MW	
Solar PV	631.53	1450.00
Solar CSP	150.00	200.00
Wind	633.99	1850.00
Biomass	0.00	12.50
Biogas	0.00	12.50
Landfill gas	0.00	25.00
Small Hydro	0.00	75.00
Total MW	1415.52	3625.00
Total Capacity - Bids Received	2127.66	
Percentage Preferred Bidders	66.5%	
Number of Passing Bids	28	

Preferred Bidders Solar PV

Solar Photovoltaic		
Project_ID	Project_Name	Capacity (MW)
IPPID164	SlimSun Swartland Solar Park	5.00
IPPID155	RustMo1 Solar Farm	6.76
IPPID064	Mulilo Renewable Energy Solar PV De Aar	9.65
IPPID128	Konkoonsies Solar	9.65
IPPID163	Aries Solar	9.65
IPPID443	Greefspan PV Power Plant	10.00
IPPID696	Herbert PV Power Plant	19.90
IPPID065	Mulilo Renewable Energy Solar PV Prieska	19.93
IPPID052	Soutpan Solar Park	28.00
IPPID035	Witkop Solar Park	30.00
IPPID037	Touwsrivier Project	36.00
IPPID182	De Aar Solar PV	48.25
IPPID572	SA Mainstream Renewable Power Droogfontein	48.25
IPPID031	Letsatsi Power Company	64.00
IPPID032	Lesedi Power Company	64.00

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IPPID159	Kalkbult	72.50
IPPID444	Kathu Solar Energy Facility	75.00
IPPID564	Solar Capital De Aar (Pty) Ltd	75.00
No. of Preferred Bidders for Solar Photovoltaic: 18		631.53

Preferred Bidders – Onshore Wind

Wind		
Project_ID	Project_Name	Capacity (MW)
IPPID123	Dassiesklip Wind Energy Facility	26.19
IPPID138	MetroWind Van Stadens Wind Farm	26.19
IPPID202	Hopefield Wind Farm	65.40
IPPID036	Noblesfontein	72.75
IPPID148	Red Cap Kouga Wind Farm - Oyster Bay	77.60
IPPID043	Dorper Wind Farm	97.00
IPPID186	Jeffreys Bay	133.86
IPPID225	Cookhouse Wind Farm	135.00

No. of Preferred Bidders for Wind: 8	633.99
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Preferred Bidders – CSP

Solar CSP		
Project_ID	Project_Name	Capacity (MW)
IPPID798	Khi Solar One	50.00
IPPID118	KaXu Solar One	100.00
No. of Preferred Bidders for Solar CSP: 2		150.00