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Funding to set up the Renewable Energy Independent Power Producer Procurement Programme

June 2020

This report is part of project Strengthen national climate policy implementation: Comparative empirical learning & creating linkage to climate finance (SNAPFI), see www.diw.de/snapfi. This project is part of the International Climate Initiative (IKI). The Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) supports this initiative on the basis of a decision adopted by the German Bundestag. More information on IKI can be found at www.international-climate-initiative.com.

Supported by:

Federal Ministry
for the Environment, Nature Conservation
and Nuclear Safety

based on a decision of the German Bundestag

RESEARCH REPORT

Funding to set up the Renewable Energy Independent Power Producer Procurement Programme in South Africa

An example of transformation in public finance and institutions and the implications for climate and development

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COMPLETE DRAFT (following earlier outline submitted to DIW)
Timing: send to DIW Feb 2020 / revised April 2020 / final June 2020
Report by University of Cape Town (UCT) researchers for IKI-SNAPFI (Strengthen national climate policy implementation: Comparative empirical learning & creating linkage to climate finance), contributing to Cross Country Study (CRS) in first year of project

Contents

1. Introduction

This research report focuses on funding to help set up the Renewable Energy Independent Power Producer Procurement Programme (REI4P) in South Africa. The REI4P is widely considered a success (Baker & Wlokas 2015; Eberhard , Kolker & Leigland 2014; Morris & Martin 2015; Ndlovu & Inglesi-Lotz 2019). The REI4P is a competitive tender process that was launched to facilitate private sector investment into grid-connected renewable energy (RE) generation, and several lessons have been learned (Eberhard & Naude 2016). In this report, it is analysed as an example of transformation in public finance and institutions, in particular funding for the 'IPP office', arguing that this was a key institution in the success of the REI4P.

1.1 Research questions

The guiding question for the cross-country study in the overall project is "What has been the contribution by climate finance to transformational change and what has enabled or prevented success?" (DIW 2019). Applied to the REI4P example, this broad question raises further sub- questions. What mix of finance contributed to the REI4P – international and domestic? What role did institutions, political economy and other factors play ? In what sense can the REI4P be considered transformational? What are the multiple meanings of transformation in relation to climate and development goals in South Africa?

1.2 Methodology

The IKI-SNAPFI project is undertaken by a consortium of research organisation, coordinated by the German Institute for Economic Research in Berlin (DIW Berlin). DIW Berlin provided a guidance document with useful methodological 'elements of the country cases for the cross-country study' (DIW 2019). This document provided framing for country examples in the first year's cross-country study, given that detailed country case studies were being developed by teams in each of Germany, Indonesia, India, Brazil and South Africa (led by a UCT team in the last instance). The guidance document was based on discussions at the kick-off workshop (27-29 September 2019, Berlin), an earlier draft and comments from all partners. The guidance sought to provide some similar dimensions across examples from different contexts, while allowing space for focusing on different aspects. The UCT has this applied the guidance in a flexible manner, adjusting aspects where the SA experience required this, and continuing the engagement with the framework itself. A key question is 'what is transformational change?', some initial thoughts have been outlined an internal briefing paper on this topic (Vivid Economics 2020), on which we have commented. We offer further thoughts that arose in researching this example, with the aim of continuing the conversation on transformational change, which we expect to continue throughout the four-year project.

That said, the examples follow the structure of the 'how' and the 'what', and addresses, economics, politics and political economy.

1.3 Contribution to first cross-country study

This research report is a contributing by the University of Cape Town (UCT) team to a Cross Country Study (CRS) in the first year of a project to 'Strengthen national climate policy implementation: Comparative empirical learning & creating linkage to climate finance (IKI-SNAPFI). This example, together with another from the UCT team and

those from research partners in Brazil, India, Indonesia and Germany, will information the CRS.
This case study proceeds as follows. Section 2 outlines the enabling conditions for institutional innovation, funding and political economy, while also addressing constraining factors. The results are addressed in various dimensions of transformational change in section 3: the shift from coal to renewable energy and scaling up of the latter, rapidly falling prices, shifts in instrument for procurement and transformation in socio-economic benefits. The IPP office, while not the only actor, was located at the heart of these changes. The conclusion reflects on lessons from this case study for institutional innovation and transformational change.

2. Enabling conditions

This section examines a range of enabling conditions for transformational change. The general guidance for the cross-country study suggests that questions of process (the *'how'* questions) include "which factors and conditions have contributed to achieving such [transformational] outcomes? What are the causal mechanisms between factors, conditions and then outcomes?". In analysing these questions, we emphasise that change is not linear nor is finance the only enabler. A broader set of enabling conditions is key to transformation.

In this section, we first examine institutional innovation in the REI4P, before turning to funding. The context of the political economic context is crucial in enabling change, but also constrained what is possible.

2.1 Institutional innovation: the IPP office (policy and governance[1])

The establishment of an IPP office for procurement played an important role in the success of the REI4P. The IPP office was established by the Department of Energy (which established the REI4P in 2010), National Treasury and the Development Bank of Southern Africa (DOE , NT & DBSA 2015).
What was crucial was institutional innovation, notably the setting up for an office that oversaw the procurement under the REI4P, the so-called 'IPP office'. The office was established by Government departments, but operating as an agency and physically located outside of government offices. Yet the IPP office was still accountable to government and mandated to meet strategic objectives.[2] The relationship between government and the private sector (in this case RE project developers) and its running in a professional manner is a model that might be applied to other technologies in South Africa, and potentially may be of interest to other countries (ASSAf 2019). For example, the IPP office in Centurion (outside of Pretoria) established procedures for the confidential handling of bids, in a manner which gave confidence to project developers. The IPP office hired competent staff, led for many years by Karen Breytenbach, previously a consultant for National Treasury. Funding was also used for technical advice. South Africa had no experience running renewable energy competitive tenders and in the design stage the IPP office tendered for a large number of financial, legal and technical transaction advisors to prepare all the bid documentation and legal contracts within the short nine months preparation time for the first bid window (Eberhard & Naude 2016). External

[1] The sub-headings have been named as to be easily understood in the SA context (with the generic terms from the guidance note (DIW 2019) retained to make clear to other partners which aspect is being analysed)

[2] The diagram in the guidance (DIW 2019) reflects international actors having strategic objectives, but omits showing such objectives for domestic actors. This is likely simply an omission. We assume that domestic actors in South Africa have strategic objectives – in relation to development and climate policy.

professional firms were used to conduct bid evaluation, so selection of qualifying bids was independent of government (ibid).

The critical role of the IPP office in driving down prices, through a series of bid windows, thereby increase the scale of renewable energy, is analysed in more detail in section 3 below. At least as important as the transformation of energy systems were the socio-economic benefits, which are discussed in section 3.7. The seed funding for the IPP office had a catalytic effect in social, economic and environmental dimensions.

2.2 Economics / funding

The Global Environment Facility (GEF) provided a US$6 million grant for advisory services under the Renewable Energy Market Transformation Project (Eberhard et al. 2014).

> "*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*" (Eberhard et al. 2014).

National Treasury later offered R 100 million, which was used to repay DBSA and to pay costs in the first and part of the second bid window (Martin & Winkler 2014). So, a mix of international funding and a smaller investment by domestic institutions was a key factor in getting the REI4P going. This funding for the REI4P catalysed the transformation of the renewable energy market. While not supporting individual projects, through the series of bidding windows it enabled many projects to reach financial closure, connect to the grid and start generating electricity from renewable energy sources, thereby contributing to mitigation. The IPP office developed a line of funding from within the REI4P for transaction advisors and for running future tenders, thereby designing for financial sustainability, by requiring bidders to pay a development fee of 1% of their total project fund to the DOE's Project Development Fund window (Eberhard & Naude 2016).

The scale of grant finance of $6 million was by no means the largest grant funding for mitigation in South Africa. To put this into context, other bi- and multi-lateral funding reported in SA's 3rd biennial update report included significantly larger finance. Under the current MRV system, developing countries submit biennial update reports (BURs). South Africa is one of only 6 developing countries that have submitted a third BUR (DEA 2019); 29 are on BUR2 and 49 on BUR1.[3] Even though it is not mandatory to report on support (including finance) needed and received, SA's BUR3 contains information on bi-lateral and multi-lateral financial support committed between 2015 and 2017 (Table 4.1 on bi-lateral and Table 4.2 on multi-lateral).

- Grant by Green Climate Fund in 2017 to South African National Biodiversity Institute for ZAR 4 944 798 (US$ 380 000) for building SANBI's capacity to

[3] See https://unfccc.int/BURs

develop GCF funding proposals and manage and monitor GCF projects in South Africa.

- Grant / credit line by Germany: German Federal Ministry for the Environment, Nature Conservation, and Nuclear Safety (BMU). Implemented by KfW Development Bank of ZAR 733 768 600 (US$ 56 388 976) Credit line for the promotion of renewable energies and energy efficiency in southern and eastern Africa. Duration: 11/2008 till 12/2016. The project helped to secure an environmentally-friendly supply of energy in South Africa. It ensured a long-term credit line from KfW Development Bank of EUR 50 m to the Development Bank of South Africa for financing the Jeffrey's Bay Wind Farm (one of largest wind farms in SA) in the Eastern Cape province.
- Grant by German Federal Ministry for the Environment, Nature Conservation, and Nuclear Safety (BMU). Implemented by Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH (GIZ) of ZAR 51 363 802 (US$ 3 947 228), for a Cities for Climate Change project. To support cities in tackling the challenges presented by climate change. Advising cities on how to adapt development plans, urban development strategies and urban design ideas and put them into practice in a way that creates cities fit for climate change. Project supports Chile, India and South Africa. The city of Durban was chosen in South Africa.
- Grant / equity fund by Global Environment Facility (GEF) to the Development Bank of Southern Africa of ZAR 195 189 375 (US$ 15 000 000, *and* co-financing of US$ 147 006 333) for an equity fund for the Small Projects Independent Power Producer Procurement Programme (SP-IPPPP) (Year: 2015). Removing Financial Barriers in the Small Scale Renewable Energy Projects: Establishment of an Equity Fund
- Grant from Germany of ZAR 69 919 342 (US$ 5 373 193) for an Energy Efficiency in Public Building Infrastructure Programme (EPBIP). Project is from 2017 to 2021. EEPBIP helps scale up the support for implementing the Energy Efficiency and Energy Demand Management flagship programme. Main aim is to ensure all spheres of South African government contribute to the national greenhouse gas mitigation, energy efficiency and energy security targets.
- Grant by the Global Environment Facility in 2015 to United Nations Industrial Development Organisation [presumably working in SA?] of ZAR 75 167 220 (US$ 5 776 484; with co-financing of US$38 439 000) for a project on Industrial Energy Efficiency Improvement in South Africa through Mainstreaming the Introduction of Energy Management Systems and Energy Systems Optimization (4 year duration) (Year 2015). Project aim is to accelerate and expand the introduction of Energy Management Systems (EnMS), Industrial Energy Systems Optimization (ESO), and the Energy Management Standard ISO 50001 Series within the South African industrial (and selected commercial) context.

The examples include a variety of reasons why climate finance might be considered 'transformational' - building capacity for further fund-raising for adaptation in national entity; providing credit lines that enable actual implementation of wind energy, a key mitigation technology, which other may follow; bringing in cities as new actors on adaptation and mitigation; enabling smaller scale IPPs, which are likely to deliver co-benefits in poorer communities, and again new actors; showing leadership through energy efficiency in public buildings, which may motivate others to follow the lead; and supporting energy efficiency in industry, which should pay for itself but needs to be mobilised.

Readers interested in the full table are referred to the 3rd BUR (DEA 2019) and for previously reported information to the previous two BURs (DEA 2014, 2017).

2.3 New actors in renewables and incumbents in coal (political economy)

South Africa's political economy is characterised by the 'triple challenge' of high unemployment, high inequality, and high poverty (NPC 2012). The last decade has seen persistently low economic growth, with the country in recession in several quarters (REF). In such a precarious economy, action on climate change tends to take a lower political priority. There is a very high political sensitivity to employment losses, given that official unemployment is at 29% by a narrow definition by StatisticsSA[4], and much higher when considering discouraged work seekers and among youth. Addressing the 'triple challenge' is even harder when the national utility and country is highly indebted.

In the electricity sector, Eskom debt of ZAR 450 billion (ca. US$ 30 billion) threatens the sovereign rating falling below investment grade (colloquially 'junk status'). The Minister of Finance in his budget speech had bluntly stated that the "SOEs pose very serious risks to the fiscal framework", yet set aside "R23 billion a year to financially support Eskom during its reconfiguration" (Mboweni 2019). This amounts to further cash injections of R69 billion ($ 4.7 billion) over three years.

Implementing South Africa's Nationally determined contribution (NDC) and enhancing the mitigation ambition in targets should be understood in this context: high debt, poverty and inequality tend to make climate policy a lower priority. SA's first and current NDC frames the mitigation target as fixed level ('peak, plateau and decline' or PPD trajectory) - an economy-wide emissions limit, in a wide range between 398 and 614 Mt CO_2-eq for 2025 and 2030 (RSA 2016). The country also chose to highlight investments it has made it mitigation.

> "South Africa has already made significant investments in mitigation. As part of a Renewable Energy Independent Power Producer Procurement Programme (REI4P) has approved 79 renewable energy IPP projects, total 5 243MW, with private investment totalling ZAR 192 billion (approx. US$ 16 billion). Another 6300 MW are under consideration. Investment in public transport infrastructure was US$ 0.5 billion in 2012, and is expected to continue growing at 5% per year. South Africa established a South African Green Fund with an allocated US$ 0.11 billion in the 2011 to 2013 budgets to support catalytic and demonstration green economy initiatives. Resources for the Fund will have to be increased in future to enable and support the scaling up of viable and successful initiatives, including contributions from domestic, private sector and international sources" (RSA 2016).

The NDC estimates incremental costs of US$3 billion per year "to expand REI4P in next ten years" (from 2015, when the INDC was submitted). The NDC explicitly notes that these are costs derived from energy systems and economic modeling, not financial costs – the latter would be needed for business and investment plans.

At the same time Eskom has exhibited a lack of support for the REI4P. In 2016 Eskom refused to connect more already approved renewable IPPs to the transmission grid, a move that was revealed in leaked correspondence of the then Eskom Chief executive (Creamer 2016).

[4] http://www.statssa.gov.za/?p=12689

While South Africa has put forward a clear, fixed-level mitigation target range, and indicating the investment required, implementing measures (including the REI4P) remains contested.
Two key labour unions, the National Union of Metalworkers of South Africa (NUMSA) and National Union of Mineworkers (NUM), have opposed the REI4P. One should add that other unions, including the federation COSATU, have in the past taken position in favour of climate action while insisting on a just transition (COSATU 2016). The opposition from NUMSA and NUM can be explained by several factors. Any union is concerned about job losses, so there is an obvious concern about a transition from coal to renewable energy. Even if over time and across the country, more jobs can be created, this does not help the specific workers and communities directly affected by the 'end of coal' (Strambo , Burton & Atteridge 2019). Another factor is an ideological preference for a 'developmental state', which in the electricity supply industry is translated into public ownership of a national utility. This is not without a basis, as Eskom has played a key role in electrification. Yet the line that 'we are not opposed to renewables, but to privatisation' makes clear an ideological preference.

It also can sound thin, when combined with a third factor, active disinformation about the benefits of coal and risks of moving to renewable energy (Eberhard & Godinho 2017). This dynamic was exacerbate during the Zuma administration and the project of state capture. 'State Capture' was connected to a faction in the ANC centred on the South African President and president of the ANC (South Africa Public Protector 2016), (Bhorat et al. 2017),(Eberhard & Godinho 2017). In defiance of government policy and the flouting legal contracts, this network implemented its own often-covert policies one of which led to the REI4P stalling. Financial close was delayed for period of two years, but in March 2018 it was announced that 27 projects in BW 3.5 and 4 would be signed in April 2018. The Zuma faction was narrowly defeated in the ANC elective conference in December 2017. The REI4P was partially resuscitated a few months later. The stop-start pattern in the REI4P has constrained even more progress, and reflects contestation among key actors.

New actors in the minerals-energy complex, energy and finance have emerged, contesting the role of incumbents. The REI4P has changed the past shape of minerals-energy complex (Fine & Rustomjee 1996) by bringing in foreign and domestic investment – a new players. There are old vested interests in the coal value chain (from mining to electricity and liquid fuel supply to minerals beneficiation) and new ones, including in a rapidly growing renewable energy industry. Debates about nuclear power are polarised, shaped by competing alliances (Rennkamp & Bhuyan 2016). Decision-making in the electricity sector is contested across and within government, business, labour and civil society. These battles are not only about energy sources and technologies, but which institutions are preferred, including electricity supply should be publicly owned by a 'developmental state' or whether to open to competition. For some actors, the arguments resonate with ideological arguments, favouring free markets or socialism. Lack of transparency and power struggles in the policy sphere are key challenges to decarbonisation (Baker et al. 2015).

The REI4P has led to a reconfiguration of interests, but also concentration: "With each bidding round of the programme, ownership of the industry is becoming more consolidated with fewer companies being allocated the right to generate more MWs"

(Baker 2015). According to one study, the IPP's in the REI4P threaten Eskom's interest as a monopoly, which it resists, using the electricity crisis to maintain its influence (Morris & Martin 2015).

South Africa has also seen a trend of financialisation, with a larger share of GDP coming from the financial sector. There is a high concentration, with the four major commercial banks having large market shares - Standard Bank (25%), ABSA (21.6%, First Rand Bank (18.8%) and Nedbank (17.8%) (Ashman & Fine), known as the 'Big Four'. The relationship between players in the 'traditional' MEC (who invested in physical assets) and new actors remains fluid and emerging (Burton 2011). The implications for transformation of finance are explored further in section 3.4.

3. What changes delivered by REI4P were transformational?

Section 2 of this report has reviewed the institutional innovation in the REI4P, funding to set up an IPP office and the political economy with its enablers and constraints. In this section, we turn to analysis of the resulting transformational change. For this example, we consider various dimensions of change, related to both development and climate, that might be considered transformational.

Transformational change has been defined in various ways and context. The World Bank Group considers transformational change in the context of poverty reduction and shared prosperity to mean

> *"support[ing] deep, systemic, and sustainable change with the potential for large-scale impact in an area of a major development challenge. Such engagements help clients remove critical constraints to development, cause or support fundamental change in a system, have large-scale impact at the national or global level, and are economically, financially and environmentally sustainable" (World Bank 2016).*

A guidebook on shifting paradigms for climate action defines transformational change as

> *"a structural change that alters the interplay of institutional, cultural, technological, economic and ecological dimensions of a given system. It will unlock new development paths, including social practices and worldviews" (Mersmann & Wehnert 2015).*

Both definitions emphasise the importance of development pathways, which is the broader transformation, with implications for environmental change (including climate) and world views. In the following, we examine aspects of change that were transformational in a more granular manner, in the specific context of the REI4P in South Africa.

3.1 Transformation of scale of renewables

The rapid expansion of renewable energy (RE) technologies from a very low base was driven by the REI4P. The programme has been called "an undisputed success in terms of capacity, investment and price outcomes" (Eberhard & Naude 2016).

Over four bid windows (BW) from 2010 to March 2019, the REI4P brought investment of R209.7 billion from the private sector into South Africa, of which R41.8bn (20%) was foreign direct investment (IPP office 2019). In other words, most of the equity and debt invested has been domestic, not international. This is part of the reason why the UCT team's focus is on programme funding for the IPP office.

Another reason is that the crisis in SA's electricity means major changes will happen anyway This crisis also means there are potential opportunities for decarbonisation (Baker, Burton, Godinho & Trollip 2015). The IPP office has played a critical institutional role in the REI4P, and there have been suggestions that its offices might procure power from coal IPPs as well. While this is likely to be contested and require adjustments, it is not is not inconceivable; Eskom used the same bidding system framework used by the REI4P in 2014 to introduce a 'baseload coal' IPP programme) (Lawrence 2020).

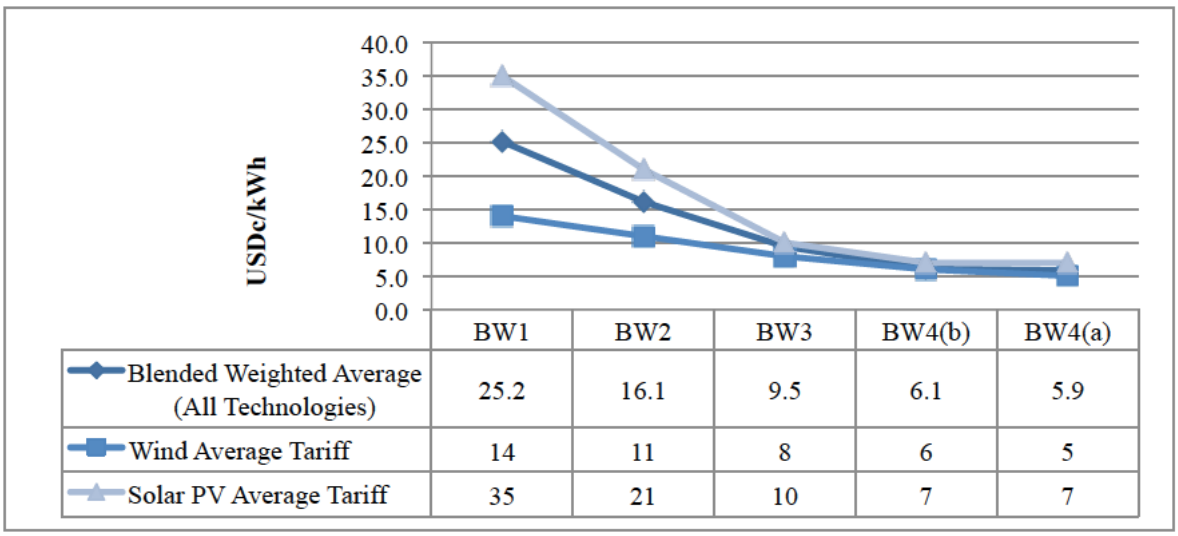
3.2 Transition from coal-fired power to renewable energy

Over the BW rounds, 6 422 MW of capacity was procured from 112 IPPs. Of this installed capacity, 3 976 MW was connected to the national grid, generating 35 669 GWh in total, and 10,648 (96% of P50 contribution) (IPP office 2019) and calculates to about 4.9% of electricity generated by Eskom, reported as 218 939 GWh per year (Eskom 2019). Most of the installed capacity actually procured has been in wind (52%) and solar photovoltaic (PV) (36%) technologies, with concentrating solar power (CSP) making up 9% (of total MW) (ASSAf 2019).
Yet the success of the REI4P should not lead to the conclusion of the 'end of coal' being certain. The rapid decarbonisation of electricity supply is not a *fait accompli*. As Baker and her co-authors point out, despite the positive example of the REI4P, "there are structural path dependencies around coal-fired generation and security of supply" (Baker et al. 2015). Despite this caveat, the REI4P transformed the scale of renewable energy for electricity generation in SA, and opened up opportunities for decommissioning of coal-fired power.

3.3 Rapidly falling costs of wind and solar PV

The costs of RETs have fallen dramatically, globally and in South Africa – passing a key tipping point. When such costs are reported for installed capacity (in units of $/kW), there is a legitimate concern that this does not reflect the variability of RE sources, compared to coal or nuclear plants which are available for most (but not all) hours of the year. However, when reported in c/kWh, the time factor takes into account what is generated – and provides a better comparison.

Globally, investments in new RE capacity exceeded those in fossil-based electricity generating technologies, with most installation in emerging and developing countries (IRENA , IEA & REN 21 2018). It is well established in the literature that technology learning (both innovation and economies of scale) are a function of global cumulative installed capacity (Ibenholt 2002; IEA & OECD 2000; Nemet 2006). Prices for RETs have been declining worldwide – from Peru with solar PV at 4.8c/kWh (US $ cents); via auctions in Dubai going below 3c/kWh, and continuing to reduce (Kruger & Eberhard 2018).



	BW1	BW2	BW3	BW4(b)	BW4(a)
Blended Weighted Average (All Technologies)	25.2	16.1	9.5	6.1	5.9
Wind Average Tariff	14	11	8	6	5
Solar PV Average Tariff	35	21	10	7	7

Figure 1: Tariffs for wind, solar PV and all RE technologies across four bid windows in REI4P. Source: (Kruger & Eberhard 2018)

In SA, the IPP office ran a competitive tender or auctioning process, over what is known as several 'bid windows' (IPP office 2019). The tariffs awarded to preferred bidders after competitive bidding have declined rapidly. Bid tariffs have fallen sharply over the course of the programme and the projects in later bid round are amongst the lowest priced grid-connected RE projects (Eberhard & Naude 2016). Figure 1 shows the rapid fall in c/kWh to around 5c/kWh (Kruger & Eberhard 2018). South Africa has passed a 'tipping point', in the sense that grid-connected new wind and solar PV is now cheaper than new coal or nuclear power. While falling pricing are a function of global investments (Ferioli , Schoots & Van der Zwaan 2009; IEA & OECD 2000), the process within South Africa has been seen in South Africa, with only 20% of the investment here being FDI (see 3.1 above). The IPP office has played a critical role as an institution managing a transformation of electricity prices.

3.4 New forms of concentrated ownership? A transformation of financial models, or not?

In SA's political economy, new actors have entered the energy sector and shifted relations in 'minerals-energy complex', as outlined in section 0 above. The implications of new forms of highly concentrated ownership include risk to the REI4P; in particular that on-selling of financialised assets will contribute to capital flight (Baker 2015). Project finance has been the dominant mode of financing, financing 88% of the 64 projects in the first three bid windows. The 'Big Four' banks and Investec providing a total of R57 billion, DFIs R27.8 billion and insurance funds R4. Billion (Eberhard et al. 2014). Project finance introduces contradictions between financial and other objectives, and within the REI4P. "This contradiction is found between the short term nature of capital gains (Crotty, 2003), demands for project 'bankability' and the maximisation of shareholder on the one hand and on the other, the unique and potentially progressive requirements for community ownership and economic development that in South Africa's case are needed to legitimise a renewable energy project" (Baker 2015). She goes on to argue that on-selling of debt and equity (which becomes possible after financial close), capital is disconnected from the original physical asset, and remove from obligations in South Africa. This raises the question whether renewable energy will end up replicating trends previously seen in the MEC, in a different form but with high concentration. It is for these reasons that models of ownership of RE are important (and considered in the case study by the UCT team). Whether the REI4P contributes to transformation in the sense of more decentralised forms of ownerships – social,

community or municipal ownership – or merely new forms of concentrated ownership, remains to be seen.

3.5 Are auctions more transformative instruments than feed-in tariffs ?

One can identify three main ways of procuring independent power producers (IPPs) – direct negotiation, feed-in tariffs (FITs) or competitive tenders / auctions[5] (Kruger 2019). While direct negotiations remain the dominant instrument globally, this hides a trend of smaller IPPs being procured in structured programmes – FITs or auctions. In South Africa, in line with global trends, most renewable energy IPPs are being procured by auctions. FITs have had significant impact in Germany and Europe (Cointe & Nadaï 2018), but have delivered very little investment in sub-Saharan Africa (Kruger & Eberhard 2018). South Africa introduced a FIT briefly (NERSA 2009), but this had virtually no uptake. One explanation for this is that there were no long-term standard contracts offered (Kruger 2019), whereas the REI4P offered successful bidders 20-year power purchase agreements. This is not an intrinsic feature of FITs, as in Kenya for example, FITs are combined with standard contracts (Kruger 2019). The combination of a known price and guaranteed off-take for 20 years, however, clearly provides significant certainty. The initial investment in high upfront cost can be repaid; the calculations of internal rates of return become simpler. FITs have been successful in Europe, but cannot be assumed to work in the same way in countries with a different institutional landscape (Kruger 2020).

It may be that the REI4P is a case of "intensifying competition" (but not heavy competition) leading developers to produce original, untested ideas, without the "heavy competition [that] drives them to stop investing altogether (Gross 2019). The IPP office played a role in managing 'intensifying competition', aided by its institutional location as an agency of government but operating in a different manner.

While no instrument is perfect, an expert interviewed for this case study does argue that auctions work better, especially in developing countries, delivering better prices (Kruger 2020). Rapidly falling prices have been seen in SA (see section 3.3 above) and in many other parts of the world (IRENA 2019). Competitive tendering as in the REI4P has strengths (real price discovery, selecting best projects, more certainty on costs and quantities; commitments and transparency; and weaknesses: relatively high transaction costs; and risk of underbuilding and delays (especially due to overly aggressive bidding) (Kruger 2019).

The REI4P made a key shift in the instrument for procurement, from FIT to competitive tendering. While no single instrument is better in all contexts, the South African experience that auctions are more effective is likely to be applicable in other developing countries. In the context of the SNAPFI project, it would be interesting to compare experiences on instruments, as outlined here for SA, with Brazil, Indonesia, India and Germany. This could be considered as a theme for the CRS in Year 2, together with other suggestions and after discussions with all partners.

[5] This paper uses auctions, competitive tendering and bidding interchangeably. The latter two terms are most commonly used in the public debate in SA, with the rounds being known as 'bid windows'.

3.6 Potential lessons for other countries

It has been noted that SA's REI4P achieved more investment via IPPs in 4 years than in the rest of Sub-Saharan Africa over a quarter century (Eberhard & Naude 2016). How applicable is the SA experience in other countries?

The institutional design of the REI4P may be of interest to other countries, particular African and other developing countries (Eberhard & Naude 2016). Kruger and Eberhard (2018) drew detailed lessons relating to three broad areas: programme management, programme design; and markets. Most of the lessons were not related to finance as such. For example, on programme management, key factors identified were political support, institutional setting, the management team and its style, and quality of transaction advice –; only programme resources referred directly to finance (Kruger & Eberhard 2018).

Ndlovu and Lotz (2019) note that the share of fossil fuels as a percentage of total primary energy supply (TPES) has declined in SA between 1990 and 2015, while it has remained approximately constant in OECD countries, and increased in BRICS countries collectively. However, SA comes from a particularly high base of coal use, which dominates its TPES. They argue that, while SA "is currently on the correct trajectory in terms of its renewable energy policy implementation and increasing renewable projects growth", the country should prioritise the industrial development of the renewable energy sector (Ndlovu & Inglesi-Lotz 2019).

3.7 Transformation in socio-economic terms

3.7.1 Pro-poor distributional effects *are* transformational

We argue that 'transformational effects' being considered as distinct from 'distributional effects', as in the guidance (DIW 2019) separates climate and development. Distributional equity is the transformation desired in South Africa. The 'triple challenge' is unemployment, poverty and inequality, and its implications for the political economy have been elaborated above . Climate policy needs to locate itself in this context, to be transformational in South Africa.

In the example of the REI4P, this means that the socio-economic benefits were not mere 'co-benefits', if that implies secondary benefits. The REI4P has been found to be "unique in that it in order for projects to qualify, developers must commit to undertake requirements for community ownership and economic development benefits in a country with gross socio-economic inequality" (Baker & Wlokas 2015). Wlokas (2017) has examined the institutional work undertaken by state, business and communities in shaping socio-economic development. The IPP office thus had to innovation, implementing a 70:30 weighting of price to socio-economic factors, not the usual 90:10 price: other. The specifications for SED criteria has evolved significantly over the bid windows (Wlokas 2017).

3.7.2 Transformation: more weighting of economic development criteria

The criteria applied to evaluate bids went well beyond financial considerations. To qualify for comparative evaluation, projects had to meet criteria including legal, land acquisition and land us, environmental consent, financial, technical and economic development criteria (Eberhard & Naude 2016). Once they had qualified, eligible bids were scored on price but also overall on economic development (ED). ED criteria counted for a maximum of 30 points out of 100, and the 70:30 split represented a significant change from the 90:10 split under Preferential Procurement Policy Framework Act (Eberhard et al. 2014). Particularly relevant are tensions between hard

financial requirements, notably 'bankability' required by banks and investors, and the economic benefits and community ownership criteria (Baker & Wlokas 2015).

3.7.3 Co-benefits of energy programme - reduced GHG emissions and water savings

The RE4P was initially conceived as a response to the country's climate change mitigation commitments, as well as a means to achieve other economic development goals (e.g. job creation, local economic development etc.) (Eberhard et al. 2014). The pledges made in Copenhagen informed the adoption of national climate policy (RSA 2011), adopted shortly before SA hosted COP17 in Durban. The REI4P is explicitly mentioned as a mitigation measures in the country's first NDC under the Paris Agreement (RSA 2016). Yet the REI4P has been an energy programme, changing SA's energy development pathway, and delivering socio-economic development benefits. Whether climate is considered a co-benefit of energy development, or development a co-benefit of climate policy is arguably a futile debate in directionality or what is 'primary': What matters is that multiple benefits need to be pursued (Khosla, Dukkipati, Dubash, Sreenivas & Cohen 2015).

The reporting by the IPP office includes reporting on socio-economic development (IPP office 2019), as well as energy metrics, and mitigation as a co-benefit. The mitigation effects of the REI4P were reported as 36.2 Mt CO_2 reduced since inception, of which 2.91 Mt in the first quarter of 2019; and water savings of 42.8 million kilolitres – which are relevant to adaptation (IPP office 2019). The REI4P has "potentially transformative social, economic and technological impacts" (Baker 2015).

Government and business dominate, whereas communities have to live with the results, and the co-benefits for communities are variable across projects. "Community renewables, in the form they are implemented in South Africa, provide rich learning material for policy makers, industry and civil society as the specific set of community benefit obligations provides opportunity for all actors involved to build relationships that positively impact inequality and poverty related challenges in the country" (Wlokas 2017). Researchers argue for building capacity and framework for increased participatory governance in future (ibid.) (Nkoana 2018).

3.7.4 Limited localisation and therefore socio-economic transformation

While the REI4P has seen very significant private sector investment in RETs, there has been relatively little local localisation. A recent study suggests the programme did not sufficiently incorporate "many of the practical lessons learned from countries that have successfully used localisation in the past" (Leigland & Eberhard 2018). There has been analysis of localisation strategies for the wind industry specifically (Szewczuk 2012) and REI4P more broadly (Walwyn & Brent 2015). The experience of limited localisation suggests more careful re-design may be needed, revisiting lessons on manner and timing of import substitution, REIPPPP-driven job growth and industrialisation (Leigland & Eberhard 2018) and tighter local content provisions would lead to higher levels of local manufacturing (Walwyn & Brent 2015),
The REI4P has created 40 134 job years - the equivalent of a full-time job for one person for a year - for SA citizens (IPP office 2018, 2019).
While the first bid window saw a larger share of locally-owned companies, the later rounds have seen international firms take larger shares of a rapidly growing market. There has been a requirement for RE project developers to invest in socio-economic benefits, with bids being assessed for 30% on a list of criteria and only 70% (rather than the usual 90%) on cost, yet the reality of community benefits requires further investigation, beyond a single PhD thesis (Wlokas 2017). There has been critical analysis of the extent to which non-price factors "such as local jobs, local black

ownership, local content, and local community ownership" determine the final bid evaluation (Leigland & Eberhard 2018).
Nevertheless, socio-economic development contributions total R860 million up to 2019, with additional contributions to enterprise development (IPP office 2018, 2019). The issue of community-owned renewables has been raised as part of a debate around a just transition to a low carbon economy (Overy 2018), and the broader question of transitions and their political economy (Baker & Phillips 2018; Burton , Caetano & McCall 2018; IRENA et al. 2018; Overy 2018). Localisation requirements are advanced to provide a tangible economic justification for a programme (Leigland & Eberhard 2018). The practical experience is that project developers struggle with the requirements and the job creation promised by local industrialisation does not materialise to the extent expected.

3.7.5 Local ownership

Findings on local ownership may be added, once SA country study is more fully developed

4. Conclusion: Implications for transformational change

This report has examined the REI4P as an example of transformational change, including the role of climate finance for institutional innovation.

The REI4P can be considered an example of transformational change. Major challenges in the political economy of SA meant that progress was far from linear, with the programme halting for several years. Despite these challenges, the REI4P transformed the scale of RE for electricity in SA, thereby starting a transition away from the coal-based energy economy. Prices of RE technologies dropped dramatically through several bid windows (in a 'reverse auction' process), and thus transforming the market.

Institutional innovation was a key enabling condition for the REI4P, supported by relatively modest funding to set up the IPP office. Throughout this report, we have shown the role that catalytic role that the IPP office played. Grant funding at a relatively modest scale enabled institutional innovation. These included its institutional and physical location, mode of work as an agency establishing innovative relationships between government and private sector firms, utilisation of technical advice, etc. The IPP office oversaw several bid windows, transforming the instrument from FIT to auctions. Addressing the socio-economic triple challenge of unemployment, poverty and inequality is central to any claim to be transformational in SA. The REI4P redefined the approach, reporting on multiple development benefits, weighting socio-economic development more strongly, though achieving limited localisation and ownership.

Was the REI4P a programme that supported "deep, systemic, and sustainable change with the potential for large-scale impact in an area of a major development challenge" (World Bank 2016) ? Section 3 has outlined several dimensions of change that can be considered transformational for the energy development path of SA. The internal briefing document on transformational change suggests that in achieving depth of change, "international climate finance is only transformational where it results in systemic change within the area of intervention and beyond" (Vivid Economics 2020). The REI4P was also a programme that demonstrates that structural change that " alters the interplay of institutional, cultural, technological, economic and ecological dimensions" (Mersmann & Wehnert 2015) of the power system.

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