The Role of Ownership in a Just Energy Transition

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Preface

A just energy transition (JET), fits within a global discourse on wider just transitions. These cover how stakeholders (particularly workers) and the economy are affected by a shift to more environmentally sustainable and socially equitable practices. A JET, as described in this report, can be defined in several ways. In the broadest terms, it is about bringing justice, fairness and equity to the process of moving to energy systems that are better for people and the planet. While the environmental and climate change imperative is to transition to energy systems that are low-carbon, less polluting and more sustainable, the socio-economic components of a JET revolve around using this transition in a way that supports human wellbeing by helping to address poverty and inequality. There are many important and interrelated factors that need to be considered when conceptualising a JET, one of which is the issue of ownership - both within the energy system and around the transition process. To realise a genuinely transformative JET, fundamental changes not just in the sources of energy, but also in who owns and controls various components of the energy system will need to take place.

From the research published here, an aspirational goal emerges of a future energy system primarily based on renewable energy where the majority of ownership is social or communal in nature. This differs dramatically from the current ownership situation in South Africa. Some approaches to energy system transition operate from a hyper-capitalist or pro-market "green economy" basis. While these may deliver some of the required shifts in energy systems, and associated reductions in greenhouse gas emissions, they do not contribute adequately to reducing inequality and poverty and to sharing ownership. The focus of this report is on a more transformational or progressive JET; one in which ownership changes can help to tackle the dire socio-economic challenges that face South Africa at this point in its history.

Due to the dramatic reduction in the costs of renewable energy technologies, a move towards renewable energy is inevitable. However, to avoid the mistakes and injustices associated with old order energy systems, steps must be taken to make the transition a just and equitable one. There is a strong political component to this transition, and purely managerial or technocratic solutions will not be enough. Therefore, there is a need for a national government plan for a progressive JET which is inclusive, transparent, affordable and sustainable, and which also helps to deal with inequality, poverty and ownership of the emerging energy system.

This report does not aim to give a dispassionate review of all future energy options based on the trajectory expected from the current political context in the country. Rather, since the search for justice is a key motivator of the research approach, this report advocates for a progressive JET by providing examples of what has been achieved elsewhere in the world, along with recommendations that could lead to the most progressive possible change in the ownership of South Africa's energy systems in the foreseeable future.

This report is not intended to be exhaustive. While it builds on the most authoritative sources currently available, it does not pretend to have all the answers. This is intended to be a starting point for engagement and input with many stakeholders and decision-makers at all levels. It is hoped that the content of this study can provide a platform for rigorous debate, and that the discussion around ownership in a JET will receive greater public attention. It is further hoped, that with this publicity, government will engage with all stakeholders to make provision for community ownership within a JET plan.

Acronyms and abbreviations

AIDC	Alternative Information and Development Centre
ANC	African National Congress
BBEEE	Broad-based black economic empowerment
BRICS	Brazil, Russia, India, China, South Africa group
COSATU	Congress of South African Trade Unions
CRELUZ	Cooperativa de Energia e Desenvolvimento Rural do Médio Uruguai Ltda (Brazil)
CSIR	Council for Scientific and Industrial Research
DBSA	Development Bank of Southern Africa
FiT	Feed-in tariff
GHG	Greenhouse gas
IEP	Integrated Energy Plan
ILO	International Labour Organization
IPP	Independent power producer
IPPP	Independent Power Producers' Procurement Programme
IRENA	International Renewable Energy Agency
IRP	Integrated Resource Plan
JET	Just energy transition
MEC	Minerals-energy complex
NDB BRICS	New Development Bank
NEDLAC	National Economic Development and Labour Council
NERSA	National Electricity Regulator of South Africa
NPC	National Planning Commission
NUMSA	National Union of Metalworkers of South Africa
PAIA	Promotion of Access to Information Act
PPA	Power purchase agreement
PV	Photovoltaic
RE	Renewable energy
REIPPPP	Renewable Energy Independent Producer Procurement Programme
SED	Socio-economic development
SHS	Solar Home System
SOE	State-owned entity
SSEG	Small-scale embedded generation
Stats SA	Statistics South Africa
WWEA	World Wind Energy Association

Contents

1 Introduction

Access to electricity in South Africa is unevenly distributed. Approximately 14% (2.5 million) of South African households still lack access to the national electricity grid, while at least 40% of South Africans experience energy poverty.[1] Despite this, South Africa produces more greenhouse gas (GHG) emissions per capita than the average of the G20 group of nations.[2] As this report will show, this is largely the result of energy-intensive industries, coupled with a highly centralised grid network established in large part to serve the interests of the mining and industrial sectors. The coal that still provides 90% of South Africa's electricity generation needs comes from local mines.

Within this energy context, South Africa is also a deeply divided society with one of the highest Gini coefficients in the world, and the highest Palma ratio.[3] According to the upper-bound poverty line, some 56% (or 31 million) South Africans are living in poverty.[4] One of the major contributing factors to this poverty is unemployment. Recent figures illustrate that at least 28% of South Africans are unemployed. If the expanded definition of unemployment is used, this figure jumps to 36%.[5]

A potential solution to both of the highly interrelated problems of energy poverty and high GHG emissions is to be found in the expansion of renewable energy (RE). RE is a set of low-carbon energy generation technologies that lend themselves to decentralisation. RE is also an industry that can create many new employment opportunities. International experience of RE development has also shown how it can, in certain circumstances, stimulate local economic activity and begin to address poverty.[6]

The potential of RE has been recognised by the South African government which has, despite recent political setbacks, begun to introduce more sustainable, low-carbon energy generation technologies in line with some of its national development goals.[7] Over the last seven years, 6 422 MW of renewable electricity (of which 3 162 MW is already operational) has been procured by Eskom, the national energy utility, via its 2010 Renewable Energy Independent Power Producer Procurement Programme (REIPPPP). As of June 2017, carbon dioxide reductions resulting from the REIPPPP amounted to 17.25 million tonnes.[8]

Some analysts have hailed REIPPPP as an outstanding success story. Anton Eberhard and Tomas Kåberger, for example, state that it has "delivered remarkable investment and price outcomes which offer lessons to other countries".[9] Some ZAR 202 billion worth of debt and equity investments have indeed been realised by the programme, and average bid prices for electricity generation have fallen by 49% and 75% for wind and solar photovoltaic (PV) respectively over the various procurement rounds.[10] While these figures are impressive, they do, however, tell us very little about the social and economic impacts of this burgeoning sector in South Africa. This is a serious caveat because while the REIPPPP is mandated to provide electricity it is also intended to have "a substantial influence on economic growth and socio-economic development ... [and] contribute to broader national developmental objectives such as job creation, social upliftment and the broadening of economic ownership".[11]

A number of research reports have been published in recent years which interrogate the successes or otherwise of the social and economic development imperatives of the REIPPPP in South Africa.

These reports overwhelmingly conclude that while it has resulted in a substantial increase in RE electricity generation and a reduction in generation costs and GHG emissions, few of the intended socio-economic benefits have been adequately realised.[12] This report will briefly review these developmental weaknesses as they relate specifically to ownership before offering an alternative vision of how RE can be implemented in South Africa as part of a just energy transition. The first section of this report is the introduction. The second analyses the different interpretations of what a JET actually entails, while the third section provides an analysis of the current state ownership structure and situates it within the broad context of the energy landscape in South Africa.

The fourth section is a brief review of the limitations of the REIPPPP as they relate specifically to ownership. Section five provides a brief overview of ownership structures within embedded and offgrid generation in South Africa.

The sixth section of this report provides an alternative vision of how RE developments can be owned and managed via the concept of "community energy". This section includes case-studies of ownership best practice from countries in the Global North and South. Wider political, economic and societal issues that influence the potential realisation of a JET, such as the nature of state support, financing and public attitudes to RE, are also explored.

Section seven lists the critical success factors that have enabled successful community energy projects to thrive.

Section eight examines the ownership challenges and opportunities in South Africa as they relate to implementing a JET. It reveals in detail the issues that need to be overcome to realise a JET in South Africa, and includes a number of recommendations.

Section nine suggests the next steps that could be taken by government, civil society, labour, and academia to realise a JET in South Africa. This is followed by a brief conclusion.

2 What is a just energy transition?

In recent years the concept of a JET has begun to feature more prominently in policy discourses concerned with how societies move towards low-carbon energy futures. The idea of a JET has its roots in the labour-led environmental justice movement that emerged in the United States in the 1980s which drew attention to the obvious linkages between environmental problems, such as pollution, to issues of social and economic exclusion.[13] In more recent years, it has been predominantly associated with the International Labour Organization which has promoted the idea of a just transition largely in terms of expanding the rights of workers as the economy is "greened".[14]

However, this somewhat labour-specific definition is being broadened. Peter Newall and Dustin Mulvany offer a useful starting point for this more comprehensive definition when they state that a JET aims to:

> *"steer society towards a lower carbon future … underpinned by attention to issues of equity and justice: to those currently without access to reliable energy supplies and living in energy poverty and to those whose livelihoods are affected by and are dependent on a fossil fuel economy."* [15]

However, as Jacklyn Cock cautions, the idea and meaning of a JET is pliable and has already spawned three different interpretations.[16]

Firstly, there is the hyper-capitalist variant of the so-called "green economy" (sometimes also referred to as green capitalism), in which nature is entirely financialised and reduced to "natural capital".[17] In this version a transition to a low-carbon future is a source of new speculative profit. Nature is valued according to the "eco-system services" that it provides. Forests are useful as carbon-sinks, whereas deserts have little natural capital value. In this scenario, eco-system services can be valued, offset and traded in the "market" like any other commodity. Those features that do more to assist with the transition to a low-carbon future, like forests or wetlands, will thus be of greater value and more likely to be preserved. Where the limits of the ability of natural capital are reached, technological innovation is said to be able to step into the breach to ensure that the transition occurs. For this transition, energy is seen entirely as a commodity to be traded. For proponents of this form of transition, little needs to change outside of the market being given more freedom to operate, unhindered by regulatory controls. This interpretation can be loosely categorised as "pro-market, neo-liberal" and has little concern with social justice or equity.

The second interpretation is a more moderate version of the "green economy". This understanding, Cock argues, is a "shallow, reformist" transition that is preoccupied with building a new energy regime via new "green jobs" in RE to replace the "brown jobs" that will be lost. It is largely technocratic in nature, and assumes that the market and new technologies will provide the solutions to the current climate crisis. While it is concerned with protecting the interests of the vulnerable, it does so in a welfarist manner, rather than via systemic changes.[18] In essence this understanding calls for an expert-driven, bureaucratic and depoliticised transition that finds its answers in gradual reformist measures that do little to disrupt existing systems and means. In addition, it continues to see energy as a commodity. This interpretation can be loosely categorised as "reformist, liberal".

The third interpretation of the JET differs radically from the previous understandings in that it sees the climate crisis "as a catalysing force for massive transformative change" which promises "new ways of producing and consuming".[19] As such, the idea of a JET should be considered within a wider discourse which argues that as societies transition away from high carbon economies they must do so in ways that do not replicate the injustices of the past. This discourse calls for a holistic "just transition" that is not only related to energy, but informs and guides transitions in other critical areas such as food production, employment, public transport, and housing, among other things. A JET is, therefore, part of a wider transition to a just society. This understanding of a JET rejects the market as a solution to the environmental crisis, and calls for the social ownership of decentralised energy infrastructure and the production and equitable distribution of affordable RE.

For this third interpretation, there are four key priorities. Firstly, there is the issue of "energy democracy" (also called "energy justice" or "energy sovereignty"[20]), which is understood as the need for "greater democratic political economic control over energy by citizens and communities".[21] This represents a fundamental shift in decision-making around energy towards workers, communities and the public more widely.[22] Secondly, accessibility and affordability of supply is emphasised.

Thirdly, just as those advocating for a "just transition" in food production are calling for local control, so a JET demands an equally fundamental shift in the ownership structure of energy generation technologies towards non-corporate, community-based and socially owned RE. Ownership, is therefore, of critical importance to this interpretation of a JET because it requires both democratic and local ownership of energy infrastructure. Lastly, this approach also calls for workers who are likely to lose their jobs during such a transition to be properly compensated in the form of alternative work and training opportunities.

For proponents of this third interpretation, a JET treats energy as a resource, not a commodity, one which is part of the wider "commons" and one which should be democratically and socially owned, as opposed to being controlled by the "market".[23] This interpretation can be loosely categorised as "progressive/ transformative".

Commentators have noted that the realisation of this latter understanding of a JET is a "radical, systemic and politically oppositional project" which will involve a "deeply political struggle".[24] As consultant on climate, energy, poverty and social justice issues Tasneem Essop recently noted, it will require a "paradigm shift" in thinking.[25]

3 Eskom, the minerals-energy complex and energy ownership in South Africa?

The South African economy is dominated by what has been described as the minerals-energy complex (MEC) which has shaped, and continues to shape, the country's economic and political trajectory.[26] This complex has its roots in the discovery of diamonds and precious metals in South Africa in the 1860s and 1870s and the demands that the mining of these resources made on electricity generation, which were largely met by coal which had also been discovered in the 1870s.

This coincidence set the stage for a symbiotic relationship to emerge on the one hand between the mining and energy generation sectors, and between both of them and the State on the other, that persists to this day. In short, the MEC is founded on the dispatch of centralised coal-based energy as cheaply as possible to a small group of energy-intensive users. It was not until 1923, however, that electricity generation, transmission and distribution was centralised with the government's establishment of the Electricity Supply Commission (ESCOM, now known as Eskom). The emergence of Eskom as a centralised, state-owned entity (SOE) established the pattern of energy ownership that persists to this day.

Eskom was mandated to provide cheap electricity from South Africa's abundant coal deposits, was exempt from taxation, and was not profit-seeking. By 1948, Eskom had effectively become a vertically integrated energy monopoly as it had purchased all private and municipal generation capacity. Throughout the apartheid era (1948–1994), the priority of the State, and thus Eskom, remained the generation of cheap energy for mining and industry based on plentiful coal and exploitative labour practices, and it was able to offer some of the cheapest electricity in the world.

The advent of democracy in 1994 resulted in some changes at Eskom: labour practices were improved and the government embarked on a significant electrification programme which has seen household grid connections increase from 55% in 1994 to 86% today.[27] In the late 1990s, pressure grew from some within the ruling African National Congress (ANC) to privatise parts of Eskom, but this was resisted by the Congress of South African Trade Unions (COSATU) and the South African Communist Party (SACP), both of whom were key ANC allies.[28]

Instead of privatising Eskom, and under increasing global pressure to liberalise the energy market, the Eskom Conversion Act was passed in 2002. This Act converted Eskom into a profit-seeking entity that was obliged to pay dividends to its sole shareholder, the State. This conversion was in accordance with the pro-"market", neo-liberal economic approach of post-apartheid ANC governments. It resulted in enormous dividends being passed to the government, instead of being reinvested in infrastructure. For example, one year after the conversion, ZAR 549 million was paid to the government in dividends; a figure which reached ZAR 1.6 billion in 2006.[29]

Despite this reorganisation, Eskom's ownership model remained the same and has remained largely geared towards the interests of mining and industry. Even today, the so-called Energy-Intensive Users Group of 31 companies consume over 40% of electricity generated by Eskom and continue to "dominate the drafting of energy policy in their favour, including pricing".[30] Eskom still generates 95% of South Africa's electricity, is responsible for 100% of electricity transmission through its ownership of the entire electricity grid, and accounts for 45% of all electricity distribution to endusers (municipalities account for the balance of distribution).[31] The 5% of electricity not generated by Eskom is provided by a combination of the REIPPPP plants, small municipal generators, and private/business generators.

Can the ownership structure outlined above deliver a JET in South Africa? The answer to this question relates to what kind of JET we wish to see. For example, it is certainly possible for a state-owned energy entity to provide RE on a mass scale. In Uruguay, 95% of the country's electricity now comes from renewables; predominantly via the state-owned energy utility UTE which opened up RE generation to private companies. As the country's previous national director of energy stated "what we've learned is that renewables is just a financial business".[32] This remarkable achievement has been achieved "through long-term policy, backed by all of Uruguay's major parties and an adequate legal, regulatory and institutional framework".[33]

However, it has been done in a top-down fashion with minimal popular participation in decision-making and, according to some, has actually deepened energy poverty in the country.[34] Critics have also noted that due to the penetration of foreign firms, few local jobs have been created and profits from RE developments flow out of the country.[35]

It can be argued that this is an example of the "reformist/ liberal" definition of a JET. A new energy regime has been created, driven by state policy and private investment in a largely technocratic fashion, with little input from citizens other than through their ability to hold government officials accountable at the ballot box for their policy decision. However, if we want to see a "progressive/ transformative" JET, then this centralised decision-making model does not fit because it makes no provision for local control and local decision-making. For a progressive/ transformative model to be implemented, SOEs would have to surrender a great deal of their decision-making powers around policy and the distribution of resources (including those relating to rent-seeking).

An SOE like Eskom will not willingly give up its deeply entrenched powers, and it will take enormous political will to change the current situation. In addition, the current ideological positioning of both Eskom and the ANC is neo-liberal and pro-market, and does not lend itself to the kind of paradigm shift in thinking that is necessary for a progressive/ transformative JET in South Africa. So, in short, there can be little hope of Eskom delivering a JET in South Africa as it is currently constituted. This does not mean, however, that it cannot be reformed to provide the kinds of regulatory and technical support that is necessary for a JET.

Can private for-profit companies be expected to deliver a JET in South Africa? It is clear that there is the potential for private companies to entrench RE in South Africa. This will obviously be beneficial for the environment but as we have seen, this is only one aspect of a JET. Despite all the diversionary rhetoric, the sole aim of any for-profit private company is to maximise profits. Anything that interferes with this process will be resisted.[36] The idea of giving communities complete power over decision-making within a for-profit private company is antithetical to the company's imperative to maximise profits at all costs. What this means is that there can be no progressive/ transformative JET in South Africa if energy reform is left entirely to the private sector. This is not to say that there is no role for the private sector in a JET. As will be shown in this report, most conceptualisations of community ownership involve significant and sustained relationships with private companies. Even those that reject any form of private ownership or management still need to engage the private sector to, at the very least, construct and maintain their community energy projects.

In addition, the above analysis certainly does not mean that there can be no role for private companies in a progressive/ transformative JET. In fact, in the absence of sufficient state capacity to provide the infrastructure and finance for an energy transition, the role of private companies is critical. However, as this report will show, the level of private sector involvement in terms of financing and decision-making is a critical determinant of the type of JET that will emerge. Aside from the provision of the actual "hardware" of an energy transition, the role that private companies can play will be determined by political and ideological decisions.

4 The REIPPPP and ownership

The political and ideological motivations behind REIPPPP remain uncertain. Politically, the government has placed the programme squarely within its claim to be pursuing a low-carbon energy future. However, the executive summary of the latest quarterly report on the Independent Power Producers Procurement Programme indicates that the motivation for it had more to do with the power supply crisis that began in 2008 and that reoccurred in 2014/15 than a genuine commitment to RE.[37] The report notes:

> *"The Department of Energy's Independent Power Producers Procurement Programme was established at the end of 2010 as one of the South African government's urgent interventions to enhance South Africa's power generation capacity."*

As Edith Kiragu points out, "the primary purpose for initiating the REIPPPP was to address the current energy crisis, and not to access renewable energy per se".[38] It is important to interrogate the motivations behind the programme because it provides a useful insight into the South African government's level of commitment to the programme.[39]

It can also be argued that South Africa's emission reduction commitments made at the 2009 Conference of the Parties (Copenhagen Accord), was one of the drivers for the REIPPPP.[40] Whatever the motivations for the REIPPPP may be, South Africa committed itself in 2010 to producing 17 800 MW of new generation capacity from RE sources by 2030. As we have seen, of this amount 6 422 MW has been committed, of which 3 162 MW is already operational.[41]

In line with its pro-market orientation, the South African government chose to procure this energy from private companies. One of the conditions of the programme is that private generators can only sell their energy to Eskom. Initially, a feed-in-tariff (FiT) was to be offered, but after it became apparent that this may be illegal in terms of South Africa's procurement laws, an auction system was adopted whereby winning bidders would sign power-purchase agreements (PPAs) with Eskom. This auction system, which has now completed five rounds (including bid window 3.5), attracted over 300 submissions, of which 92 were successful.[42]

In line with the government's commitment to foster local economic development, bidders were not assessed on price alone. While 70% of the score a bidder received was based on price, the remaining 30% was based on the bidders' commitments to various socio-economic development categories and on how well these were articulated. These commitments and the associated weight each would carry comprised: job creation (25%); local content (25%); ownership (15%); management control (5%); preferential procurement (10%); enterprise development (ED) (5%) and socio-economic development (SED) (15%). In terms of ownership in particular, the bid criteria state that a minimum of 2.5% of each project must be owned by the local community (effectively an equity shareholding in each company) with a goal of 5% local ownership.[43] In effect, this means that only 4.5% of the overall bid assessment was specifically related to ownership.[44] According to the bid criteria, the would-be owners of equity stakes must live within 50 km of the relevant RE development.

The government claims that ZAR 12 billion in net income (in real terms) will accrue over the life (assumed to be 20 years) of the RE projects to local communities through their equity ownership via community trusts that have been established to manage profits from their ownership shares.[45] The government also states that the 2.5% minimum local community ownership figure has been exceeded, claiming that on average 11% of REIPPPP projects are owned by local communities.[46]

Despite these figures, research shows that there are a number of problems with the way the programme functions in terms of realising its ownership goals.

4.1 Uneven community identification

Research suggests that the identification of which communities will benefit from ownership commitments is problematic. Often there is more than one distinct local community within the arbitrary 50 km development radius. Sometimes, there are no identifiable communities within the developmental zone (such cases are rare).[47] In addition, some communities are situated within the same 50 km radius of more than one RE development, and certain communities get a disproportionate amount of the benefits. Lastly, the identification of who actually represents any given community is not given sufficient attention by project developers. The identification of legitimate and representative community leaders can be a protracted process which project developers often find an onerous task.

4.2 Uneven community engagement

Evidence shows that meaningful consultation with communities affected by RE rarely happens throughout project cycles. Community members are often not properly consulted both before and during construction phases. In addition, community members are not adequately represented in community trusts or, when they are represented, their engagement in decision-making processes is extremely limited. Community trusts tend to be overwhelmingly made up of investors or investor-appointed trustees. Cheryl McEwan argues that the whole programme has assumed a "passive beneficiary model".[48]

4.3 Delays in dividend payments

Due to the need to pay off debt financing, community members are unlikely to see any dividend payments from their equity shareholdings until at least 2028.[49]

Interestingly, during the completion of this research report, the new Minister of Energy, Jeff Radebe, stated on 8 March 2018:

> *"I have requested the IPP (Independent Power Producers) Office to ensure a more equal distribution of the benefits to the communities, specifically the distribution of the dividends, by analysing and creating a better and more efficient structure for this purpose."* [50]

This is the strongest admission to date from government that there are serious problems with how benefits from the programme which are specifically related to equity ownership shares are managed and are distributed among community members.

4.4 Sub-optimal land use

Despite being an issue of enormous political importance in South Africa, the issue of land ownership has hardly featured in debates about the location of land-hungry RE developments. McEwan argues that this is because of the particular discourse the South African government has used in relation to the REIPPPP.[51] She argues that the government has adopted a discourse that compares the development of renewables to the opening of a new resource frontier that promises benefits to all, thus doing the important "political work" of avoiding questions about optimal land use. In addition, there is an associated discourse that suggests that most of the land where RE developments are located, and will be located is sparsely populated anyway, although this is not always the case.

Contestation over land where RE developments are located is a distinct possibility in the future. At the time of writing the National Assembly Constitutional Review Committee is considering whether to allow expropriation without compensation. Most RE developments are located on "white-owned" farm land, where farmers benefit from lucrative lease agreements which pay on average 2% of total project revenue to landowners.[52] Some of this land may well be claimed by previously evicted communities and therefore could be subject to expropriation. How this will affect the private ownership of RE developments and future revenue payments is unclear. However, it is likely that considerable resentment will arise over the ability of landowners to extract rents on land that is claimed by others. As has been illustrated in relation to RE developments in Scotland, this may be experienced as a second form of expropriation as land which was previously taken from its original owners or from the commonage becomes a site of renewed accumulation.[53]

As it is presently constituted, the REIPPPP cannot deliver a progressive/ transformative JET. Its rationale and ideological/ political foundations are antithetical to the types of systemic change that is necessary for a transformative JET to take place. Current conditions are pro-market, involve significant penetration of private capital which is looking for profitable shareholder returns, and current government involvement is largely restricted to assessing bids during the auction process. What benefits there are for community members are limited in scope and are almost entirely mediated by the interests of private capital. Where there are social benefits, these tend to be welfarist and fail to take fundamental social justice concerns into account.

5 Small-scale renewable energy in South Africa and ownership

Small-scale embedded generation (SSEG) and off-grid generation can also offer a means of progress towards a transformative JET in South Africa. However, both have similar ownership problems to those encountered with utility-scale generation.

5.1 Small-scale embedded generation

Due to the tripling in real terms of domestic electricity tariffs since 2007, and the dramatic fall in the price of small-scale solar PV installation over the same period, there has been a rapid increase in the number of small-scale solar PV plants in operation in South Africa. While a precise figure is difficult to determine because of the number of unregistered installations, in July 2017 it was estimated that there were 138 000 small-scale solar PV installations in South Africa, with a combined capacity of some 144 MW.[54]

Close to 129 000 of these installations were less than 1 KW which indicates that they are mostly domestic installations. Given the high up-front costs of these installations they are largely located on homes in upper-middle-income and higher-income households.[55] This presents a serious challenge to a JET because it enables wealthier electricity users to abandon the municipal grid which reduces municipal electricity revenues and threatens the grid's long-term stability by placing the burden of maintenance onto poorer households. Recent research in Stellenbosch illustrated that if 2 255 homes (the current maximum local infrastructure could handle) in affluent areas installed solar PV, this could result in the net loss in revenue to the municipality in one year of nearly ZAR 10 million, about 2.4% of total electricity revenue.[56] This could have serious consequences for the ability of municipalities to meet their wider developmental goals in respect of needy residents. The study also shows that if only those households which would benefit financially were to install rooftop PV, then the net revenues loss would be ZAR 2 million (0.6%). This loss could be compensated for by introducing a monthly service charge of around ZAR 360/month, although this could then act as a deterrent for residents to register their solar PV installations.

Small-scale solar PV installation in low-income homes in South Africa are, understandably, rare. Where they do exist they are championed on a case-by-case basis by non-government organisations and, in some instances, by municipalities.[57] There is currently no integrated approach which considers SSEG and ownership in low-income homes as part of a transformative JET.

Analysts have suggested that SSEG could play a role in low-income apartment blocks or in "solar farms" with localised energy distribution. Both are said to spread costs more evenly than a perhouse model.[58] While both of these options appear viable, obvious questions around financing, maintenance, ownership and control emerge. For example, who is going to finance such developments? What role will community members have in these developments in terms of ownership and decision-making? How will community beneficiaries be selected?

5.2 Off-grid and mini-grid generation

There are currently few examples of off-grid generation that has delivered to poor communities in South Africa, despite the commitment by government that it will electrify the 7% of those households which are not yet receiving grid-based electricity via off-grid technology.[59] The largest programme to date was the National Water Solar Water Heating Programme which aimed to deliver 1 million solar water heaters to homes by 2015. When the programme was abandoned in 2015, a total of just under 400 000 had been installed. The programme was beset with problems from the very start relating to poorly defined programme objectives, weak programme implementation, and an absence of monitoring of private installers which led to numerous failed installations and the use of low-quality solar water heaters.[60] The programme was supposed to be re-launched in 2016, but to date no new installations have taken place.[61]

The government has also overseen the 2001 Solar Home System (SHS) programme which aimed to provide off-grid solar PV to 300 000 households by 2006. To date, it has provided only 60 000 SHS installations, and evidence shows that these have not been welcomed by most community members. Community members commonly complain that the generation capacity of the systems is inadequate, that they cannot afford the fees

(partly because of systemic non-payment by municipalities of the free basic electricity subsidy) and that community involvement in the projects has not been prioritised. The programme is hampered by an absence of policy coordination. For example, the wholesale failure of numerous municipalities to pay electricity subsidies is matched by the roll out of SHS into areas that are then subsequently serviced by the grid.[62]

In 2017 the Carbon Trust and Council of Scientific and Industrial Research (CSIR) published a report on mini-grid applications in South Africa noting the absence of successful mini-grid applications in the country. The report highlights two mini-grid pilot projects, Lucingweni and Hluleka, but observes how both failed due to "insufficient community engagement".[63] The Department of Environmental Affairs confirmed this observation by acknowledging that the projects were "parachuted in" with little community engagement.[64]

The problems inherent in the government's Solar Water Heating and Solar Home System programmes speak to the wider issue of ownership. Both programmes encountered problems as beneficiaries were not sure if they actually owned the infrastructure that was installed in their homes. In addition, neither programme offered accessibility or affordability of supply which are key to a meaningful, transformative JET.

Many of the problems that exist within the REIPPPP are being replicated with small-scale renewable energy projects. The few projects that have been launched have exhibited similar weaknesses, especially as they relate to community ownership, engagement and expectations. Despite this, the Carbon Trust/ CSIR report into mini-grid applications rejects the idea of community-based models on the grounds that community members lack sufficient understanding of RE and because of "a lack of technical capacity and understanding of regulations, funding and relevant stakeholders". Instead, the report suggests that a public-private partnership arrangement should be adopted along the lines of the REIPPPP.[65]

It is clear that, for a progressive/ transformative JET to take place, fundamental changes need to take place in how energy is conceptualised in terms of its wider usages and, more importantly, how it is owned and operated. The next section explores successful community ownership projects in other countries, including a number of case studies, and identifies the critical institutions and ideas that make them work.

Photograph by Neil Overy

6 An alternative vision of RE – community energy

There is an alternative energy ownership structure that is gaining great traction throughout the world. This ownership structure offers an alternative to centralised state-led ownership, or largescale, private, market-based models. While this ownership structure has been described as a "slippery concept" which defies easy categorisation, it is generally known as "community energy".[66]

The British government definition is very wide:

> *"Community energy covers aspects of collective action to reduce, purchase, manage and generate energy. Community energy projects have an emphasis on local engagement, local leadership and control and the local community benefiting collectively from the outcomes."* [67]

The European Union states that an "energy community" is considered to be a small or medium-sized enterprise or a not-for-profit organisation that allows at least 51% of its equity to owned by "local members" who make up at least 51% of any "managing bodies".[68]

In 2011 the World Wind Energy Association (WWEA) defined community energy, or what it calls "community power". This definition, subsequently endorsed by the International Renewable Energy Agency (IRENA), states that for a project to be defined as "community energy", it must fulfil at least two of the following three criteria:

1. Local stakeholders own the majority or all of a project. A local individual or group of local stakeholders, whether they are farmers, cooperatives, independent power producers, financial institutions, municipalities, and schools, own immediately or eventually the majority or all of the project.
2. Voting control rests with the community-based organisation. The community-based organisation made up of local stakeholders has the majority of the voting rights concerning decisions taken on the project.
3. The majority of social and economic benefits are distributed locally. The majority part or all of the social and economic benefits are returned to the local community.[69]

Walker and Devine-Wright state that an energy project needs to be "place-based" with local participation and collective local benefits to be considered a community energy project.[70] Soren Becker and Conrad Kunze have identified four key features which they claim define community energy:

1. There is a community of place or of interest.
2. There is local ownership and control.
3. There is a collective benefit.
4. There is a shared political aspiration to transition to RE.

They argue that community energy is the "notion of a new relation between society and energy systems centred on social embeddedness as well as participation and collective effort".[71] A useful normative description for community energy is that "it involves high levels of participation in a project, including in decision-making; and a high degree of local benefit sharing".[72] The organisation Community Energy England states that "community energy refers as much to how projects are delivered as it does to what is delivered".[73]

Many RE projects in other parts of the world operate as community energy projects which meet two or more of the WWEA criteria as set out above. The essential difference between these projects and the REIPPPP is that they are owned and operated by the communities within which they exist. As will become clear, there is no standard model of community ownership, but they have a number of features in common which contribute to their success. Before exploring these common features, it is necessary to explore the dominant community ownership models with the help of illustrative case study examples.

Before doing so, however, it is necessary to acknowledge that there are a number of common RE ownership structures that have the appearance of community energy but do not meet WWEA's criteria and do not realistically offer a means by which to achieve a progressive/ transformative JET.

The following four models fall into this category:[74]

6.1 The open investment model

In this model, individuals and small businesses can participate in RE projects by holding junior participation rights in the form of shares or credit. In return investors receive dividends. There is no requirement for investors to be located in communities affected by the development just as there is no compulsion for local economic development around the project. Equally, junior investors have no specific say in how the project is run. The only link this model has to the idea of a transformative JET is that it is possible for citizens to own shares in RE developments. Projects developed in this way often have minimum investment criteria which exclude most citizens from participating.[75]

An example of this model is the Lacuna windfarm in Hohenzellig, Germany. Here investors were offered shares to anyone with a minimum stake of 10 000€ for which investors receive dividend payments against profits.[76]

6.2 The community benefit or compensation model

This particular model, which is also known as the community compensation model, is largely driven by private RE developers but is structured in such a way that local community members affected by the project receive some form of benefit. The scale of the community benefit is often the result of negotiations between the developer and the local community which means that "community benefit payments are therefore emphatically voluntary ones".[77] Such schemes have courted controversy because affected communities often view the suggested benefits simply as bribes or compensation schemes.[78] In addition, controversy surrounds the amounts offered as community benefit. Also, while affected communities have some say over how benefits are used, they have no control over the RE projects themselves. To try to address some of these concerns, various initiatives have been launched. In Scotland, for example, there is a public Community Benefit Register which includes the benefits offered by developers to communities affected by RE. This register enables community members to compare the benefits that they receive or have been offered by developers.[79] While it may be an obvious point, it is worth stating that community benefit payments do not result in community ownership or control of RE developments.

An example of a community-benefit model would be the 4 MW East Youlstone windfarm in England from which the community receives approximately ZAR 200 000 per year which is allocated to capital community projects; revenue-based community projects; schools and education/ training, and environment and heritage.[80]

6.3 The community connected model or the split-ownership model

In this model, sometimes known as the split-ownership model, developers are legally compelled to offer ownership rights to community members, so, developers could decide on a specific equity amount that they will sell to community members. For example, in Denmark the 2009 Promotion of Renewable Energy Act states that 20% of company shares must be offered to those living within 4.5 km of any RE development. In parts of Belgium, similar laws ensure that 25% of ownership is reserved for communities.[81] In the German state of Mecklenburg-Vorpommern, windfarm developers must offer a 10% equity stake to anyone living within 5 km of any project.[82]

A similar law is being considered in the United Kingdom which has set the minimum community ownership holding at 5% which critics have stated is "too low to offer any meaningful degree of community control".[83] In Denmark there has even been considerable resistance to the 20% ownership requirement with local communities stating that it does not represent real community involvement.[84] With this model there is no compulsion to ensure that the wider community outside of those who invest receives any benefit. In addition, there is no substantive community role in decision-making. Evidence suggests that the community connected model has become more of an investment scheme for citizens who are able to buys shares, rather than one which offers any meaningful degree of community participation.[85]

An example of this model is the Middlegrunden Wind Farm in Denmark. This RE development is constituted as a cooperative with 50% owned by the local municipality, with the remaining 50% owned by over 10 000 local residents who purchased shares in the project. Benefits are not widely dispersed and only accrue to those who have invested in the development.[86]

6.4 For-profit community-based model

Even though an RE project can be majority community-owned and managed, this does not necessarily mean that it will prioritise the wider interests of local communities. Numerous projects throughout the world work on a for-profit basis. While community members establish the developments, there is no compulsion to ensure that profit is broadly shared within communities.

For example, the community-owned Clean Energy Collective in Colorado sells individual solar panels to local individuals and businesses who then receive monthly credits from the electricity that is sold by the project via a power purchase agreement with a local energy company. Benefits are not widely dispersed and only accrue to those who have invested in the collective.[87] Another example is the community-owned Druiberg windfarm in Germany where profits from the venture are returned entirely to local community investors.

6.5 Not-for profit community-based model

Unlike the previous four models, the not-for-profit community-based model, is a model which could realistically deliver a progressive/ transformative JET.

There are various ways in which such schemes can be constituted, as cooperatives, community trusts or non-profit enterprises. The most popular model is the cooperative which is particularly suitable for non-profit development because it combines "flexibility, public participation based on a 'one member-one vote principle', and social responsibility". Cooperatives have voluntary and open membership, are democratically controlled and, most importantly, generally do not seek profit, but rather return revenues to further cooperative and/or community development.[88]

The Hvide Sande Wind Farm in Denmark is a good example of a non-profit community energy project. The project is 80% owned by the Hvide Sande Community Foundation, a charitable foundation, while the remaining 20% is owned by 400 local co-operative investors, as required by Danish law.[89] All profits derived from the development (which are estimated to be approximately ZAR 18 million per year) are retained and invested in local projects which are democratically decided upon by local residents. What is important about the Hvide Sande project is that it grew out of resistance to private, developer-led, RE projects as expressed in the other forms of ownership as set out above. Analysists have described a "resistance spirit" within the local community which is more concerned with the principles of "welfare and the common good" than a return on profits.[90]

Another example the CRELUZ [91] member-run co-operative in the state of Rio Grande do Sol in Brazil. This cooperative, which was formed in 1999, has 20 000 members and runs six small hydroelectricity plants (a total of 4 MW). It states that its primary aim is to supply electricity to all who need it.[92] The co-operative generates and sells its own electricity to its members and returns all its profits into building more generation capacity, local economic development projects, and to provide free electricity to those who cannot afford to pay. The cooperative provides 600 families with free electricity and employs 87 people who are provided with health insurance, transport, food and extensive training opportunities. In addition, it has a sliding tariff scale through which wealthier users subsidise poorer families.[93]

An example of a genuine community-led RE project that is more a community of interest than a community by location is the Som Energia non-profit cooperative in Spain. This cooperative, which was formed in 2011, now has 35 000 members and has signed contracts to supply electricity to over 55 000 people. To date it has financed six solar PV plants, a biogas plant, and a hydroelectric plant. Each member pays a fee of 100€ which enables them to invite another five people to join who cannot afford the membership fee. In addition, villages of less than 500 people can receive contracts with Som Energia without paying the 100€ fee. Members who find themselves in financial difficulties can receive up to a year of free energy. The cooperative raises funds via share offers to members and by getting members to pre-pay for their electricity, often years ahead of when they will consume it. When it does need to borrow additional funds, it does so from ethical banks. It is organised in a democratic way with overall decisions being taken at an annual general assembly for all members, while day-to-day decision-making is largely devolved to local groups of Som Energia members.

Analysts argue that Som Energia is "embedded within a broader movement in which Spaniards seek and support practical alternatives to the capitalist logic of exploitation". As such, it is explicitly political in that it seeks to offer an alternative RE pathway than that offered by traditional community models as set out above.[94]

Lastly, the Yansa development in Mexico is attempting to build a genuine community-led RE initiative. Yansa was established in 2008 in response to "the dire consequences of top-down wind power development" that was taking place in Mexico. After gaining support from local community members in Ixtepec, the Yansa Foundation was started to develop a 102 MW community wind farm. All profits from the development will be equally split between local economic and social development initiatives (via a community social development trust) and the establishment of new community energy projects. The project is currently stalled because of pressure being exerted on the Mexican government by transnational power companies.[95]

In reality, many community-based models, even when initiated by communities themselves, do not meet the requirements of a transformative JET. For example, while there are approximately 1 000 renewable energy cooperatives in Germany, the majority simply return profits from RE developments to investors from within communities.[96] This is also the dominant model in the United Kingdom, and in Denmark, home to over 6 300 cooperatively owned wine turbines. The benefits of ownership are generally not broadly shared among community members, but enjoyed by cooperative members, largely as payments or reduced energy costs.[97]

The consequences of this developmental model are summed up by James Angel when he states:

> *"The key actors, here, are financially comfortable individual households and communities, with smaller-scale private sector partners profiting. While energy cooperatives are encouraged, little attention is given to barriers to participation on account of pre-existing inequalities of wealth and social capital. A progressive politics of energy democracy is, of course, not counterposed to small-scale distributed ownership. However, in contrast to the neoliberal vision, a progressive agenda foregrounds universal access and socialised control, in opposition to market relations."* [98]

Many community-owned RE developments represent little more than distributed forms of private ownership with membership restricted to those who can afford to purchase shares.[99] IRENA argues that an "overly fluid" definition of community energy contributes to this problem, enabling commercial developers and individuals wishing to invest to make spurious claims about community involvement to lend legitimacy to new projects.[100] This speaks directly to how communities are defined. It is clear that many projects generate local income for some individuals and groups, but that is a very different outcome to projects which generate income for local communities.

These concerns follow the growing commercial exploitation of RE as more and more countries respond to the climate crisis by investing in RE technology. They demonstrate how the corporate sector is responding to the money that there is to be made in RE and illustrate the limitations of the promotion of the so-called green economy. For example, the growing corporate involvement in windfarms in Denmark has resulted in a noticeable fall in public support for wind energy.[101] Despite these criticisms, the various forms of community-involved projects outlined above offer more to local communities than RE projects that are entirely commercially led.

'It appears that the "open investment" and "community benefit" models characterise South Africa's REIPPPP approach. While there is a legislative requirement in the REIPPPP for developers to distribute funds locally, it is likely that even where there is no such legal commitment, commercial RE developers, at least in parts of Europe, are committing more to local communities than is required in South Africa's REIPPPP. For example, in Scotland there was a public outcry after research showed that on average voluntary community benefit schemes relating to on-shore commercial windfarms were only contributing approximately 5% of revenues to local communities.[102] As small as this contribution is, it is much better than the case of the REIPPPP, where only 1.2% of revenue goes to local communities, with an aspirational percentage of only 3%.[103] Regardless of the extent of community involvement in the various models and how they align with the objectives of a transformative JET, there is still much that can be learned from them in terms of how to begin the journey in South Africa towards a progressive/ transformative JET.

7 Critical success factors for community energy projects and a just energy transition

This section describes the critical factors that have contributed to the growth of successful community RE projects in diverse settings in Europe and South America.

7.1 Policy certainty

Perhaps the most important factor in the success of RE developments, whether they are community owned or not, has been certainty of policy from government at national and sub-national levels. This policy certainty derives from serious, high-level commitments to decarbonisation. As one report notes, "in order to provide direction, governments at national, regional and local levels should demonstrate leadership through expressing ambition to act on climate change".[104] For example, in 1996, the Danish government decided that 50% of electricity consumption would be provided by wind energy.[105] Once this decision was taken, a long-term and stable energy policy framework was established which created an enabling environment for RE development.

Such clear policies, supporting legislation, and unambiguous institutional arrangements provide regulatory certainty, which has been shown to greatly encourage investors and garner the interest of community members in RE projects.[106] As Pete Capener of Community Energy England notes, "without regulatory intervention by a government prepared to take an enabling role, community action like all other approaches to change will founder".[107]

7.2 Feed-in tariffs

There is almost universal agreement that feed-in tariffs are a major contributory factor to the success of community RE projects.[108] The key benefit of a FiT is that it ensures predictability for project developers, which enables long-term planning and, equally importantly, it allows community RE projects to access private finance. Evidence indicates that where FiTs have been gradually withdrawn or reduced, community RE project development has stalled.[109] Feed-in premiums, which pays RE developments a premium over current market prices for electricity, are not viewed as a viable alternative because they have higher transaction costs and provide less stability.

The positive contribution FiTs are reported to have had, is contrasted with the negative impact on community RE development of energy auctions. IRENA states that the energy auction system "has become a serious obstacle for community-based investments, as well as for other small and medium investors". Evidence from South Africa and elsewhere indicates that due to high transaction costs, auctions favour large, established investors and developers. Even when systems are put in place to try and offer incentives for smaller projects to enter auctions, they do not do so because the risks of failure are too great.[110]

It is important to note that the European Union is proactively working to phase out FiTs because it believes that they are anti-competitive and contradict the "free market" principles of the Union.[111] This is a clear illustration of how ideology drives policy. While the FiT has proved to be immensely successful in encouraging the growth of all forms of local RE development, it is being slowly withdrawn for political reasons. This is likely to have a negative impact on the possibility of the development of a FiT in South Africa given the global influence of "free market" ideology.

7.3 Financial support

Outside of the financial support offered by a FiT, other forms of financial assistance have proven important.

Evidence demonstrates that community RE projects benefit from financial support for preliminary investigations as upfront investment can act as a barrier to community projects.[112] In Scotland, for example, the government's Community and Renewable Energy Scheme (CARES) issues loans up to the

submission of planning permission which are then repaid when the project starts making money. If the project fails to gain consent, the loan is written off. The loans themselves cover up to 95% of pre-development costs up to a maximum of ZAR 2.5 million.[113] Similar initiatives operate successfully in Denmark and England.

Experience indicates that community RE projects find it more difficult to raise the funds necessary to bring projects to completion. Even when they do raise funds, it is often more expensive due to the perceived risk that community projects entail (lack of security).[114] This problem can be overcome by either direct government support via soft loans to community projects, or by debt guarantees from governments.[115] In Germany, for example, community RE projects can access low-interest loans from Germany's state-owned development bank which has "contributed towards local investor confidence in different types of community power projects".[116]

Community RE projects have also benefitted from favourable tax regimes. Community power projects in many European countries receive various tax benefits as a means to encourage their development.[117]

7.4 Grid access

Preferential grid access has also been successful in encouraging community RE projects. One review of community energy projects states that it is "absolutely essential for community power".[118] The European Union has taken the issue so seriously that it passed a directive stating that all RE sources should be given either "priority" or "guaranteed" access to electricity grids.[119] In Germany, the Renewable Energy Act guarantees access to the grid for RE projects and states that all energy produced by such projects must be purchased.[120] Research shows that even when grid access is guaranteed, some problems remain. Grid design is a particular problem. Many grids are designed for the transmission of fossil fuel energy and lack the capacity to integrate decentralised RE projects. However, in Germany and Denmark grid operators are legally obliged to upgrade the grid to ensure that RE projects can be connected.[121] It has recently been suggested that community-owned RE projects should be given priority grid access over commercially owned RE developments.[122]

7.5 Local government

The role of local government has also been important in the development of community-owned RE projects. While in some countries decisions about energy policy are decided at national level, other countries allow a significant degree of decision-making at regional levels, which has supported the emergence of regional targets, municipal action plans, spatial planning, and procurement of RE energy have supported community RE projects in various locations.

- **Regional targets:** Regional and local governments can establish non-binding targets to reduce GHG emissions in line with national targets. This can have the effect of encouraging support for community RE projects. For example, Scotland has set more ambitious RE targets than the United Kingdom. This has greatly encouraged the development of RE in Scotland.
- **Municipal action plans:** Municipalities can also set their own GHG emissions targets and develop their own climate action plans. In the EU, more than 5 000 local authorities have committed themselves to reduce GHG emissions by 20% and increase their share of RE by 20% by 2020.
- **Spatial planning:** Municipalities and local authorities can use planning laws and regulations to proactively support community energy projects. In addition, they can offer land for RE developments. For example, in the United Kingdom, a community-owned energy cooperative in Brighton was able to install 550 KW of solar PV on industrial buildings in the city without planning permission because of pre-existing legislation enabling the development of rooftop PV.[123]
- **Procurement of energy from RE sources:** If they are able to do so, municipalities and local authorities could commit themselves to purchase RE from community projects. For example, the city of Rubi in Spain recently issued a tender for 100% renewable power for all its government buildings.[124]

Municipalities have also played a role in investing directly in community energy projects, thus alleviating the need for projects to seek private financial assistance. For example, the Middelgrunden Windfarm in Denmark is 50% owned by the Copenhagen municipality and 50% by a local cooperative.[125]

Another recent trend has been the remunicipalisation of energy infrastructure in which municipalities and cities take back ownership of grid infrastructure. In Germany alone, some 284 municipalities have re-established control over energy infrastructure which has resulted in the establishment

of 109 new municipal energy supply and grid public entities. This process has taken place as the result of largely political processes which have begun to question the overall wisdom of placing essential energy infrastructure in private hands. In addition, remunicipalisation has been seen as a natural consequence of the move towards more community-focused and decentralised RE energy sources.[126] It should be noted, however, that municipal control of energy infrastructure does not necessarily imply a move towards community-energy project development. Municipalities are just as likely to procure services from private suppliers when cost pressures or ideology drive their policy making and decisions.

7.6 Technical support programmes

A number of countries provide advice services which can assist community energy projects through their developmental phases. These institutions provide advice and guidance to enable community RE projects to overcome administrative and technical barriers. For example, the Community Renewable Energy Support Service provides assistance in Scotland and has developed a Community Energy Toolkit which provides advice on technology, ownership and organisational models for community RE.[127] In Ireland, the Sustainable Energy Community Network carries out a similar role. IRENA has called for the establishment of community energy authorities which would provide advisory services, facilitate stakeholder engagements, and increase public awareness of community RE possibilities.[128]

7.7 Electricity retail co-operatives

In 1999, the Danish Wind Turbine Owners' Association created a cooperative structure (Vindenergi DK) that trades electricity on behalf of its members. In 2013, more than 50% of total installed wind capacity in Denmark was traded by the cooperative. Analysts argue that "the success of the model is that … it mitigates risks and transaction costs for its member co-operatives by selling the electricity for them".[129]

7.8 Right to sell electricity

The ability to sell energy to cooperative members, as has been shown, is also a feature of successful community energy projects in various locations. For example, the Ecopower cooperative in Belgium, which supplies power to over 50 000 households, only supplies energy that it has produced itself via its RE installations or from other RE cooperative generating sources. This has the obvious added advantage of ensuring that all the power it supplies is from renewable sources. It also prices its electricity competitively as it is not driven by the profit motive (under its governing rules it can only return a maximum of 6% of profits to its members).[130]

The CRELUZ project in Brazil does not benefit from a FiT, but has been financially sustainable because it is able to sell the electricity it generates locally to its members. This means that it does not need to compete with larger energy providers and does not have to pay for expensive grid connections and distribution costs. Its members are both producers and consumers of electricity.[131] This model lends itself to the realisation of meaningful energy democracy. This is particularly the case with the CRELUZ cooperative because it also develops grid infrastructure outside of the centralised national grid. It has provided over 4 500 kilometres of power lines to places previously considered too remote for electricity.[132]

7.9 Social justice commitments

Lastly, many successful community energy projects are the result of attitudinal commitments to the transformation of the energy landscape. It is clear that social justice and environmental justice issues have provided strong motivations for projects such as CRELUZ, Som Energia, and Ecopower. Simcock has described this motivation as a "resistance spirit", noting that "a surprising number" of successful community energy projects have arisen "out of protests against something else".[133] Becker and Kunze argue "that there is a growing sector of renewable energy projects across Europe that are both organised in a collective manner and driven by political aspirations beyond being part of the change or transition to community energy". This, they argue, is in direct contrast to most energy governance which is "post-political" and "managerial". They argue that a number of normative goals are shared by these community developments such as: "an overall fall in energy consumption, the protection of biodiversity, sustainable agriculture, more social equity and the empowerment of disadvantaged
social groups".[134]

However, evidence also shows that for such progressive forms of community RE development to be realised, significant social cohesion is necessary within communities. It has been argued that an essential ingredient for successful projects is a strong sense of community which can, in some cases, be more important than the possession of legal, financial or technical skills.[135]

8 Ownership challenges and opportunities for a just energy transition in South Africa

McHarg argues that "the largely uncritical activist literature on energy democracy pays little attention to how the upscaling of community energy might be achieved or the regulatory and institutional architecture needed to support it". She argues that even in Scotland where government has been a keen supporter of community RE, "it may to be too late given the state of development of the commercial renewable sector".[136]

Any failure by activists and policy makers in South Africa to fully acknowledge the scale of the challenges the country faces in terms of a transformative JET are sure to thwart any meaningful transition to a just energy landscape. There are a number of significant, and highly interrelated, challenges that face a JET in South Africa. In essence, all of the problems revolve around Eskom – both as a result of its current organisational form, and in its ideological orientation.

8.1 Local ownership of the RE development value chain

Local ownership of the value chain of RE developments is important for a transformative JET. The government has recognised this by placing local content requirements into the REIPPPP bidding structure. For example, minimum local content for solar PV is set a 45% and at 40% for onshore wind. According to the government, the REIPPPP has resulted in ZAR 38 billion being spent on local content which amounts to 50% of the total procurement spend to date.[137] Of the spend on local content, 88% of construction and operations has come from broad-based black economic empowerment (BBBEE)[138] suppliers. This means that businesses owned by black people have benefitted from the procurement to the approximate value of ZAR 33 billion.

While these figures appear impressive, there is considerable doubt as to how much of the actual value chain is locally procured. While there has been some local manufacturing of wind towers and component parts for solar PV, most manufacturing is taking place overseas. Research demonstrates that developers can "game" the local content requirements because they are calculated on total spend, not on the actual activities money is spent for. Thus, RE developers can claim transport, accommodation and similar expenses as local content. In addition, there is some evidence that imported parts are simply assembled in South Africa and then claimed as local content.[139]

Despite this, there has been some significant skills development in the RE sector in South Africa, and in the local manufacturing of RE technologies. For instance, the RE support initiatives currently include: a dedicated RE Technology Centre at the Cape Peninsula University of Technology (the South African Renewable Energy Technology Centre, SARETEC); Vaal University of Technology hosts the Centre of Renewable Energy and Water; while the University of Stellenbosch hosts the Centre for Renewable and Sustainable Energy Studies. In addition, numerous other educational institutions in South Africa are now offering a variety of courses in different aspects of RE.[140] Many small-scale RE developers also offer training opportunities for interested persons.[141]

Local manufacturing of wind turbine towers has taken place in the Eastern and Western Cape provinces, while entirely South African solar PV panels are now being manufactured in Durban. There is a Green Technology Industrial Park in Atlantis in the Western Cape, and plans are in place to convert it into a much larger "GreenTech" Special Economic Zone.[142] Atlantis also hosts the South African Renewable Energy Business Incubator (SAREBI). [143]

Much of this development is, however, stalled due to Eskom's refusal to sign off on the outstanding REIPPPPP contracts, and, critically, because of the government's failure to unambiguously commit South Africa to an energy transition. This failure has led analysts to claim that this policy uncertainty has discouraged the establishment of local manufacturing by international companies. There are presently two wind tower manufacturing companies in dire economic distress due to this failure to commit to RE.[144]

There is clearly enormous potential for a locally-owned RE manufacturing sector in South Africa to supply not only domestic electricity demand, but also demand in other parts of southern Africa. This sector has the potential to absorb many thousands of the jobs that will be inevitably lost in the coal and fossil fuel sectors thus contributing significantly to the realisation of a JET. The most significant factor in accelerating this development is policy certainty. If private companies knew that RE development would be sustained in South Africa they would be more inclined to open production factories in the country. In addition, it seems clear that more stringent rules should apply to the categorisation of what constitutes local content in order to enable an accurate account of what progress is being made.

8.2 Eskom

For a transformative JET to take place, Eskom will have to be restructured. There are a number of competing options which range from wholesale privatisation to separating the generation and transmission aspects of the entity, or separating the generation, transmission and distribution aspects. What is clear is that Eskom can no longer continue in its vertically integrated monopoly form. At the very least there needs to be an "arms length" separation of generation from transmission to ensure equitable access to the grid for RE sources.[145]

Eskom states that its mission is to "provide sustainable electricity solutions to grow the economy and improve the quality of life of the people in South Africa and the region".[146] To be able to meet its mandate, the restructuring of Eskom needs to be accompanied by a major reassessment of what Eskom means by "sustainable electricity" and how it hopes to meet this objective.

Therefore, conversations about Eskom must move beyond merely technocratic or managerial reforms to ask fundamental questions such as: What role does energy play in the sustainable developmental state and how does Eskom fits into this vision? What is the relationship between "sustainable electricity" and a transformative JET? These questions get to the heart of the RE ownership issue and role that Eskom will play in any JET.

The current phase of political transition in South Africa, and the current focus on so-called state capture and the role of state-owned enterprises like Eskom in this capture, creates an opportunity for these questions to be aired.[147] This "space" also allows us to think about how we can make large public utilities like Eskom more democratic and accountable to citizens. In short, to determine how citizens can "reclaim" Eskom in the public interest.

8.3 Policy clarity

There is a very real need for policy clarity in South Africa when it comes to the role of RE in the energy mix and its relationship to a JET. In rhetorical terms, South Africa has made a commitment to a JET. It is the only country in the world to mention the need for a just transition in its Nationally Determined Contribution to the Conference of the Parties to the United Nations Framework on Climate Change.[148] A document released in January 2018 from the government's National Planning Commission (NPC) which focuses exclusively on future energy policy includes the phrase "just energy transition" no less than seven times, but fails to provide a definition of a what it understands a JET to be.[149] In addition, in March 2018 the South African government, via the NPC, has initiated a Just Transition Social Dialogue Series to bring together various role-players to generate a "social compact" between government, business, labour and civil society that ensures a "just transition to a low-carbon, climate-resilient society".[150] While these commitments appear impressive, there are, to date, no substantive policies in place to move South Africa in the direction of a transformative/progressive JET.

Rather, what we have are questionable commitments to the REIPPPP [151], new coal-fired power stations being approved, continued rhetoric that new nuclear power remains part of South Africa's future energy mix, and recent statements by the new President, Cyril Ramaphosa, calling on mining to become a "sunrise industry", thus reasserting the centrality of the MEC to the South African economy.[152]

We have seen that policy clarity is one of the critical success factors for community energy initiatives, and such clarity is long overdue in South Africa. Thus, the revised Integrated Resource Plan (IRP) and the Integrated Energy Plan (IEP) should both be published as a matter of urgency and should, ideally, contain progressive policies around the ownership of energy.

8.4 Financing

We have seen that the financing of community energy projects is essential to their success. In the interests of furthering genuine community ownership of RE projects, the following financing recommendations are made:

1. **Feed-in tariffs:** South Africa should reconsider introducing a FiT. If FiTs are unlawful in terms of Treasury Regulations, then legislative changes should to be introduced to legalise a FiT for community energy projects. It should be acknowledged that this may be a difficult task given the global move away from FiTs in the alleged interests of increased market competition, despite their obvious efficacy.[153]
2. **State finance:** Many community energy projects raise funds by selling shares to members of the communities within which they operate. Given the levels of unemployment and poverty, this is not a realistic option for the vast majority of South Africans. This potentially presents an opportunity for state financial institutions such as the Development Bank of Southern Africa (DBSA) and the Industrial Development Corporation (IDC) to provide the capital necessary for community energy projects. This could take the form of direct equity injections or soft loans to enable communities to own at least 51% of RE projects. In addition, state financial institutions could also stand as guarantors for communities

interested in developing their own RE projects with majority share holdings. This would enable such communities to raise private capital to assist them in their endeavours.

Such funding arrangements would entail a realignment of priorities within the DBSA (more funds allocated to the South African Green Fund programmes) and the IDC away from coal (including the abandonment of the completion of Kusile coal power station) and other fossil fuel projects. This would include re-directing subsidies from fossil fuel exploration and research towards the development of community-based RE developments. Investments in fossil fuels by Transnet, Petro SA, Sasol and Eskom should be similarly redirected. Other potential sources of financing could come from the Public Investment Corporation, the Central Energy Fund, the African Development Bank (the African Renewable Energy Initiative), the BRICS New Development Bank (NBD), the Clean Technology Fund, and the global Green Climate Fund. Despite fears that it is too weak and will not promote the necessary changes from high carbon emitters, the long-delayed carbon tax should be implemented as promised on 1 January 2019.[154] Revenue from this tax should be ring-fenced not just for RE developments, but specifically for community-based RE developments.

International donor aid could also be sought to fund pioneer community-owned RE projects which would demonstrate the viability of the model in South Africa.

3. **Community trusts / cooperatives or direct payments:** The revenues that flow from RE projects should be handled by democratically elected community trusts or cooperatives which remain wholly under the control of community members. Decisions on how to spend money should be made collectively and in consultation with local municipalities. Direct cash payments from revenue to community members should be considered as an alternative arrangement. Communities should be allowed to decide which payment method they prefer.

4. **Favourable tax treatment:** As evidence shows, a favourable tax regime for community owned RE projects has also proven instrumental in their development.[155] The National Treasury could liaise with the South African Revenue Service to operationalise such a favourable regime. Such a scheme could be subsidised by higher taxes being imposed on GHG-emitting technologies, or through a surcharge on high-energy users in the industrial and residential sectors.

5. **No restrictions on sales of electricity:** Community RE projects should be able to sell their electricity to institutions outside of Eskom, such as municipalities, which is currently not permitted.[156] This process may still make use of the national grid, via a "wheeling" arrangement with Eskom. If they are cooperatives, they should also be allowed to sell electricity to their members, thus ensuring a reliable income stream.

8.5 Grid access

Utility-scale community-based RE projects clearly need greater access to the grid in South Africa. Legislation should be considered which guarantees community RE projects preferential access to the grid. Eskom recently admitted that its current funding crisis makes the upgrading of grid infrastructure difficult at present.[157] However, it should be noted that the NBD has temporarily suspended a ZAR 2.5 billion loan to Eskom to accommodate such upgrading because of Eskom's refusal to sign-off on renewable energy projects.[158]

In areas which are not currently serviced by the grid, community based RE projects should be allowed to construct their own micro-grids to service their members.

8.6 Local government/ municipalities

Municipalities present both an opportunity and a potential barrier to a genuine community-owned energy transition. While they could offer significant support to a transformative JET via technical, regulatory, planning and even financial support, a JET that places energy generation and sales in community hands threatens to deny municipalities of a significant source of revenue. In the first quarter of 2017, South Africa's 257 municipalities earned just over a quarter of their total income (ZAR 22.5 billion) from selling electricity which they had purchased from Eskom.[159] Careful consideration needs to be given to how municipalities approach the ramifications of a JET. It should be remembered that most community RE projects will not directly consume their own electricity but will look to sell it either to Eskom or municipalities (assuming that they will be permitted to do so) which suggests that electricity sales can remain a source of income for municipalities. However, it is clear that heavy municipal reliance on electricity sales for income is not sustainable in the long-term if a JET is to take place.

It is important to state that it should not be naively assumed that if municipalities gain the right to generate or purchase their own electricity they will do so via socially-owned RE projects. Efforts to ensure the emergence of socially-owned RE projects are likely to face ideological and technological barriers from all levels of government.

8.7 Community shareholding

If South Africa is serious about ensuring that there is a JET in its fullest sense, then no new RE projects should be approved unless community-members hold majority (51%) equity and decision making stakes. This is the only way to ensure that decision-making is community driven and the majority of revenue remains within affected communities. This is precisely the kind of "paradigm shift" that is required if we are to move from reformist green economy rhetoric to a transformative JET.

8.8 Technical support programmes

To assist communities in developing RE projects, a national Community Renewable Energy Support Service should be established. This service should offer technical, legal and administrative support to communities. It should have a substantive and accessible presence in all of South Africa's nine provinces.

8.9 Public awareness campaign

We have seen how community demands for RE have led to the prospering of community RE projects. To this end, the South African government should undertake a sustained and nationwide publicity campaign to inform citizens of the benefits that can flow from community energy within a transformative JET. South Africa's experience of stokvels could be used to inform the way community RE projects work.[160]

8.10 Unions and a jobs and skills pact

One of the key challenges at present to a JET in South Africa, and with the democratic ownership of decentralised community energy, involves the labour unions. On the surface, they may appear to be a considerable barrier to RE, but behind their recent actions show legitimate concerns around the lack of a government plan for a transformative JET.[161]

In 2017, COSATU declared its opposition to the REIPPPP, and in March of 2018 the National Union of Metalworkers of South Africa (NUMSA) joined court action against the signing of outstanding REIPPPP power purchase agreements by Eskom. NUMSA claimed that if the signing went ahead, in excess of 30 000 jobs would be lost in the coal sector.[162] NUMSA's action was immediately supported by COSATU, which made similar claims around job losses. Interestingly, however, COSATU demanded that the RE sector should be "state owned", and that the state should fund the establishment of worker-owned energy co-operatives. It called for a "social accord between the relevant government departments ... and labour on the creation of jobs, local production and purchase of renewable energy" and noted that it was committed to a just transition to a low-carbon economy.[163]

What COSATU's statement shows is that some within the labour movement realise that the transition from coal to renewable energy is inevitable. But what it also shows is that there is little faith in the REIPPPP model as it is presently constituted as a means by which to secure a transformative JET, or in the government's commitment to ensure that no jobs are lost during the transition. In 2011, the Department of Environmental Affairs (DEA) stated that a National Employment Vulnerability Assessment should take place to identify the impact of climate change responses on jobs, which would result in comprehensive sector jobs resilience plans.[164] To date nothing appears to have come from this recommendation.

The importance of getting unions to support a JET cannot be overstated, especially as they can become key allies in the creation of a decentralised community-owned energy system. It is clear that government is failing to reassure unions that jobs will be protected during the transition to RE, and this is having a significantly negative impact on progress towards a JET. It is therefore, recommended that government engage meaningfully with unions and industry representatives around these concerns at the National Economic Development and Labour Council (NEDLAC), with the goal of drawing up coherent plans to address these concerns.

8.11 The role of NERSA

Given the seismic regulatory challenges that a JET promises, a properly capacitated and politically independent National Electricity Regulator of South Africa (NERSA) is essential.

The preceding section highlights a number of reforms and initiatives that need to be taken if we are to move towards a transformative JET in South Africa. While some of them are undoubtedly enormously complex undertakings which "require a fundamental transformation of the existing geometrics of power", it is important to see them as part of a process towards a JET. A transformative JET is not something that can be imposed via legislative change alone because it is something that will only result from "an ongoing series of struggles over who owns and controls energy and how, where and for whom energy is produced and consumed".[165] As groundWork notes the struggle for a JET

> *"is an open-ended process of transition to a society in which people are actively and consciously making the decisions that shape their collective future. It will not be a smooth process nor is the outcome certain. How things take shape will depend on what emerges from struggles, how people learn from struggle and from doing, and where they decide to take things from there."* [166]

Photograph by Neil Overy

9 Next steps for civil society, labour unions, government and academia

The final section of this report suggests a number of possible actions that could be led by civil society, labour, government, and academia to take a transformative JET forward, particularly in terms of energy ownership. It is not intended to restate the recommendations outlined above, but rather suggests ways in which each key sector can move towards helping to realise a transformative JET in South Africa.

For a JET to be successful, all stakeholders will have to work together and cooperate with one another. These next steps are not indicating that work should happen in silos, and indeed an important overall task is to develop synergies and mechanisms for cooperation between the different groups. However, for ease of reading, the list is separated into the groups most suited to lead on each action, with the understanding that each group will have to work closely with other stakeholders.

9.1 Civil society

- There should be a much wider debate in South Africa about RE. This debate should involve discussions around climate change, the dangers of continued fossil fuel use, and the potential gains that can come from RE. It should unapologetically show how Eskom, as it is currently constituted and managed, is a barrier to an energy transition in South Africa, let alone to a transformative JET in South Africa.

- There should to be a much wider debate about a transformative JET in South Africa. This debate should ask if a JET is possible within the current "green economy" discourse of the government. It should explore the differences between the REIPPPP and genuine energy democracy. As such, communities should be made aware of the gains they could experience if a real community-owned RE programme was initiated in South Africa. Both of these debates should not be limited to "experts", or between "experts" and government, but should take place in communities throughout the country. The organising capacity of civil society and labour unions should be mobilised to this end.

- Civil society organisations in South Africa working on environmental and labour issues in particular, should, after discussion, agree on a clear definition of a transformative JET in South Africa.

- Civil society should approach government and ask it to state clearly and unambiguously what it means by a JET in South Africa, and how its current policies align with this objective.

- Civil society should call for a wholesale review of the REIPPPP. This review should consider inputs from government, labour unions, civil society/ communities and private developers. Such a review should consider what changes need to be made to the programme to work towards a meaningful, transformative JET in South Africa. If it is found that the REIPPPP needs to be replaced with a new community-based RE model, then government should do so. This call for a review should not in any way be read as a rejection of a transition to RE in South Africa. Such a transition is absolutely essential and inevitable. Therefore, great care should be taken in making this recommendation as there is a danger that entrenched fossil fuel interests will use it as a means by which to discredit RE development in South Africa more generally.

- As a short-term policy to highlight the inadequacies of the REIPPPP as a vehicle for a transformative JET, civil society could initiate multiple Promotion of Access to Information Act (PAIA) requests for private developers' economic development and socio-economic development plans, and copies of the quarterly progress reports that they are obliged to submit to the Department of Energy. This intervention would replicate the highly successful programme currently being run by the Centre for Applied Legal Studies (CALS) at the University of the Witwatersrand which has, since 2014, been requesting, and advocating around, social and labour plans from mines. This recommendation is directed exclusively at the inadequacies of the REIPPPP and is not a reflection on the essential role that RE has to play in a transformative JET.

- More research should be undertaken on the various models of community-owned RE projects. This could involve requesting the constitutions and organisational structures from successful community-owned projects in both the Global North and South. Knowledgesharing with successful community-owned projects should be prioritised. Cognisant of funding constraints, site visits to successful community-owned projects would be beneficial.

- South African civil society should look to build international solidarity networks with civil society movements overseas which are pushing for JETs, for example, the European Energy Justice Network, and the US-based Energy Justice

Network.[167] Cognisant of funding constraints, civil society should establish a similar solidarity network in Africa, and with the wider Global South community.

- Further research should be undertaken that looks specifically at how national and international financial resources can be mobilised to help fund community-owned RE projects in South Africa.

- Civil society should advocate for the government to undertake research into the merits of replacing the auction system for new RE developments with a FiT. Some key questions include: How would the FiT be structured and regulated? How would FiT prices be set? In the presence of a FiT, would generators still be allowed to sell directly to consumers?

- Civil society could also use PAIA to clarify exactly how much the South African government pays annually in subsidies to the fossil fuel and nuclear industries. Civil society could then advocate for this money to be redirected to realising a transformative JET instead.

- Civil society should try to attract the attention of an international development agency which is willing to offer financial support to a modest community-based RE project. If properly managed, this could act as a pioneering example to show how a JET could take place in South Africa.

- Civil society should organise and advocate around a JET that prioritises addressing inequities based on gender, ability, class, and race. Womin's "gender-just transition" illustrates the kind of work that is necessary.[168]

9.2 Labour unions

- Some South African unions and union federations have adopted positions on a JET, as can be found in their documents and policies, but it would help if these are made more visible to the public and other stakeholders.

- Unions should continue to work to promote a transformative JET among their members by informing them of the dangers of continued fossil fuel use and the potential gains that can come from RE. More needs to be done to ensure that RE does not pose a threat to the job security of union members during the inevitable global shift away from coal as a main energy source.

- Unions should demand from government a commitment, with enabling legislation, that ensures that workers who lose their jobs during a JET are properly compensated or reskilled. This is likely to be a challenging task as some jobs in legacy energy systems are, and will be lost, independently of a JET. For example, in South Africa a number of coal fire power stations have come to the end of their operational lives and will have to close anyway.

- More unions should look to join the international Trade Unions for Energy Democracy and use it as a vehicle by which to promote a transformative JET. In addition, unions should make use of the resources available at the Just Transition Centre hosted by the International Trade Union Federation.

- Unions should ensure that programmes linked to transformative JET are gender-sensitive.

- Unions should continue their call for the de-corporatisation of Eskom.

9.3 Government

- Government should state clearly and unambiguously what it means by a JET in South Africa, and demonstrate exactly how its current energy and labour policies align with this objective. This may involve government undertaking a comprehensive review of its national development plans to ensure that they are aligned with the "progressive, transformative" interpretation of a JET. In doing this, the needs of those most excluded from energy justice, particularly on the basis of gender, class, age, poverty and race should be prioritised.

- Government needs to ensure that the recently initiated Just Transition Social Partner Dialogue Series moves beyond simply engaging with key partners in civil society, business, and labour circles. If a new social compact is to be agreed, then this should be the product of an inclusive national dialogue. Therefore, mechanisms should be established to make this dialogue widely participatory – at local, regional and national levels – and funds ring-fenced to meet this objective. This will avoid the limitations and failures that are generally associated with top-down planning. Lessons on participatory organising and planning can be learned from Brazil. [169]

- Once this participatory approach has been agreed upon, coupled with a clear understanding of what a JET in South Africa means, the government can then set about addressing the significant governmental and regulatory changes that will be necessary to ensure its successful realisation. The creation of an enabling environment for a JET should also be undertaken in a participatory manner.

- As a matter of policy, the South African government should adopt and promote the commonly agreed definition of "community energy" which states that, to be defined as community energy, an RE project must fulfil at least two of the following criteria:

  1. Local stakeholders own the majority or all of a project. A local individual or group of local stakeholders, whether they are farmers, cooperatives, independent power generating groups (distinct from the current IPP program), financial institutions, municipalities, or schools, own immediately or eventually the majority or all of the project. [170]

  2. Voting control rests with the community-based organisation. The communitybased organisation made up of local stakeholders has the majority of the voting rights concerning decisions taken on the project.

  3. The majority of social and economic benefits are distributed locally. The majority part or all of the social and economic benefits are returned to the local community.[171]

- After a JET policy has been agreed upon, it should be carefully and consistently integrated into the IRP, IEP and relevant legislation, regulations, and policies.

- In full consultation with labour unions and industry representatives from both the fossil fuel and RE sectors, government should undertake ongoing national employment vulnerability assessments which analyse the impact of climate change responses on jobs. These ongoing assessments should result in the regular publication of sector jobs resilience plans. Such assessments and plans should be widely publicised.

- Government should anticipate and plan for disputes to emerge in relation to land where RE developments already exist, or where they are being planned. If not adequately addressed, the unresolved issues of justice around land ownership could derail any transition to a JET, given the relatively land-hungry nature of RE.

9.4 Academia

- Research should be undertaken which examines the legal forms community-owned entities can take in terms of South African law, and should state which ones are most suitable for a transformative JET.

- Research needs to be undertaken that explains how JET models can address gender, poverty, race, class, age, and disability inequities in access to energy.

- Research should continue to explore and highlight the various ownership models for a JET that are being implemented internationally. This research should highlight both successes and failures.

- Comprehensive socio-economic modelling exercises should be undertaken to give as accurate a picture as possible of the likely job losses and gains of a JET in South Africa.

- Comprehensive modelling exercises should also be undertaken to illustrate the impact of a JET on municipal finances, Eskom and overall government revenues.

- Research should be undertaken to show how electricity regulations in South Africa will have to be amended to enable a JET. This should include an analysis of possible roles for municipalities in energy generation and purchasing.

10 Conclusion

We cannot expect a JET to simply materialise due to legislative changes or the reorganisation of Eskom. It is something which will emerge, if it does, from a process, one which is likely to contested and gradual. At this relatively early stage in our journey to a JET, it is clear that renewable energy technologies have the potential to deliver a progressive/ transformative JET in South Africa. But they can only do so with strong policy support from government, civil society and unions. As this research report has argued, the current REIPPPP programme cannot deliver a progressive/ transformative JET.

This said, any transition to a model that can deliver a progressive/ transformative JET will inevitably be a measured process. As a first step, it is obvious that a number of community-owned pilot projects should be established to illustrate what is possible in South Africa. These pilot projects can act as gateway projects to accelerate the adoption of the specific community ownership model (notfor profit community-based) that is necessary for a transformative JET in South Africa.

No matter what type of community ownership model emerges in South Africa, and there may be multiple models adopted as has been the case elsewhere, it is clear that the private sector remains a critical role-player. The private sector is necessary to assist with financing and obviously has a vital role in the construction and ongoing maintenance of community projects. In addition, ongoing private-sector led technological innovation is likely to increase the opportunities for community ownership to become an established part of South Africa's energy future. However, the role of the private sector should be significantly reduced in terms of ownership and control of RE projects. In these specific areas, the private sector should be minority participants to ensure that a progressive/transformative JET can take place.

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Photograph by Neil Overy

12 Endnotes

[1] Energy poverty is defined as either not having access to the grid, or having access but not being able to afford to purchase sufficient electricity. See Mbewe, 2017, p. 2.

[2] Climate Transparency, 2017; Marquard, 2017; Methvin, 2017.

[3] Guardian Inequality Datablog, 2017. The Gini coefficient is a measure of the statistical dispersion of wealth in a country, expressed as a number which falls between 0 (perfect equality – the wealth is evenly distributed among all the people), and 1 (one person has all the country's wealth). The Palma ratio is the ratio of the richest 10% of the population's share of gross national income divided by the poorest 40%'s share.

[4] Stats SA, 2017b. The upper-bound poverty line, the highest of three measures to determine the "line" between being poor and not being poor, stands at R992 per person per month in 2015 prices.

[5] Merten, 2017. The expanded definition includes people of working age who are unemployed but have ceased looking for work, and those who are working but are not being paid.

[6] Pueyo, et al., 2013.

[7] The South African government has committed itself to provide 17 800 MW of renewable energy by 2030 (Department of Energy, National Treasury & Development Bank of Southern Africa. 2017, p. 4).

[8] Department of Energy et al, 2017 p. 2.

[9] Eberhard, A & Kåberger, T. 2016.

[10] GreenCape, 2017, p. 2.; Tsehla, 2017, p. 17.

[11] GreenCape, 2017, p. 1.

[12] See, for example, McDaid, 2017; Wlokas, H. 2015.

[13] Cock, 2018, p. 218. See also Healy & Barry pp. 454–455.

[14] ILO, 2015.

[15] Newell & Mulvaney, 2013.

[16] Cock, 2015, p. 1.

[17] The World Bank describes natural capital as "the stock of natural resources that provides flows of valuable goods and services", quoted in Fatheuer et al., 2016. p. 71.

[18] Cock, 2015, pp. 1–4. For broad critiques of green capitalism, see Fatheuer et al., 2016, and Rodgers,2013.

[19] Cock, 2015, p. 2.

[20] Energy sovereignty has been defined as "the right of individuals, communities and peoples to make their own decisions on energy generation, distribution and consumption in a way that is appropriate within their ecological, social and economic and cultural circumstances". See Cotarelo et al., 2014.

[21] Healy & Barry 2017, p. 455.

[22] Weinrub A. & Giancatarino, 2015p. 5.

[23] Cock, 2018, p. 223.

[24] Healy & Barry 2017, p. 452.

[25] Essop, 2017, p. 40.

[26] For a detailed account see, Fine & Rustomjee, 1996.

[27] ANA, 2017.

[28] Styan, 2015, p. 21.

[29] Styan, 2015, p. 20.

[30] Swilling et al., 2015, p. 13. The current list of Energy Intensive Users Group of Southern Africa members is at http://eiug.org.za/membership/.

[31] Much of this analysis is drawn from Styan, 2015, p. 24.

[32] Watts, 2015.

[33] Angel, 2016b, p. 8.

[34] Ortega, 2017.

[35] Angel, 2016b, p. 9.

[36] See Bakan, 2005;Chomsky, 1999; and Klein, 2014.

[37] Department of Energy et al., 2017, p. 1.

[38] Kiragu et al., 2016, p. 12.

[39] If the Department of Energy's website is anything to go by, the commitment is low. The RE page is at least ten years out of date. See, http://www.energy.gov.za/files/renewables_frame.html. Accessed 27 February 2018.

[40] PMG, 2010.

[41] Of the RE capacity already committed, 52% comes from wind, 36% from solar PV, 9% from CSP, with the remainder coming from landfill, hydro and biogas. (Department of Energy, et al. 2017, p. 18.

[42] Eberhard & Naude, 2016, p. 2.

[43] Department of Energy et al., 2017, pp. 11–12.

[44] 30% weighting of these socio-economic factors, of which 15% is ownership (0.3x 0.15 = 0.045).

[45] Department of Energy et al., 2017, p. 34.

[46] Department of Energy et al., 2017, p. 33.

[47] McEwan, 2017, p. 7.

[48] McEwan, 2017, p. 8. See also. McDaid, 2014; McDaid, 2016; Wlokas, 2015; Wlokas, Boyd, & Andolfi, 2012.

[49] Department of Energy, 2017, p. 34.

[50] ESI Africa, 2018.

[51] McEwan, 2017, pp. 4–5.

[52] McEwan, 2017, p. 5.

[53] McHarg, 2016, p. 9.

[54] Rycroft, 2017. Accessed 9 March, 2018.

[55] Gross et al., circa 2017, p. 1.

[56] Korsten et al.,2017, p. 38.

[57] Gross et al., 2017, p. 2.

[58] Gross et al., 2017, pp. 5–6.

[59] Jamal, 2015, p. 58. A possible exception is the IShack Project being run as a feasibility study by the Sustainability Institute at the University of Stellenbosch. See, http://www.ishackproject.co.za/. Accessed 9 March 2018.

[60] Sustainable Energy Africa, 2015, p. 5.

[61] Mbogo, 2017.

[62] Aitken et al., 2015, p. 95; Wlokas, 2011.

[63] Carbon Trust & CSIR, 2017, p. 40. See also Azimoh et al. 2015.

[64] Aitken et al., 2015, p. 44.

[65] Carbon Trust & CSIR, 2017, pp. 21–24.

[66] Becker & Kunze, 2014b, p. 181.

[67] UK Department for Business, Energy & Industrial Strategy, 2015.

[68] Ricardo Energy & Environment, 2017, p. 20.

[69] Quoted in Wlokas ,2017, p. 37. See also IRENA, 2018.

[70] Walker & Devine-Wright, 2008,p. 497.

[71] Becker & Kunze, 2014b, p. 181.

[72] Simcock et al. 2016, p. 6.

[73] Capener, 2014, p. 2. This source notes that the three principles of community energy are: democratic control; sharing benefits, and active participation.

[74] These categories have been drawn from a German government review of community energy projects (German Federal Ministry of Economic Affairs and Energy, 2016). They serve as a useful explanatory guide and are in alignment with other categorisations. Where a model is known by more than one name, this is made clear in the report.

[75] German Federal Ministry, 2016, pp. 18–22.

[76] German Federal Ministry, 2016, p 21.

[77] McHarg, 2016, p.3.

[78] McHarg, 2016, p. 4; German Federal Ministry, 2016, p. 25.

[79] German Federal Ministry, 2016, p. 24. A similar scheme has been launched in England, see Renewable UK, no date a. A significant weakness of the English scheme is its voluntary nature.

[80] Renewable UK, no date b.

[81] German Federal Ministry, 2016, p. 30.

[82] Ricardo Energy & Environment, 2017, p. 104.

[83] McHarg, 2016, p. 6.

[84] Simcock et al., 2016, p. 17.

[85] Ricardo Energy & Environment and Ecologic Institute, 2016, p. iii.

[86] Simcock et al., 2016, p. 6.

[87] German Federal Ministry, 2016, p. 41.

[88] Roberts et al., 2014, pp. 18–19.

[89] Interestingly, there was resistance from the local community to this requirement because there was a determination to see that the community rather than individuals benefited from the project. Community members wanted the entire project to be owned by the Hvide Sande Community Foundation (Simcock 2016, p. 19).

[90] Simcock et al. 2016, pp. 15–20; Roberts et al., 2014, p. 22.

[91] Cooperativa de Energia e Desenvolvimento Rural do Médio Uruguai Ltda.

[92] Simcock et al. 2016, p. 69.

93 A short video about CRELUZ can be seen here: https://vimeo.com/35512662. Accessed 3 March 2018. Another excellent example of a community-owned energy cooperative is COOPALESCA in Costa Rica – see Chavez, 2016.

[94] Hirschmann, 2017. There is a similar cooperative in Belgium called Ecopower, but it makes a small return on investment payment to shareholders (CITYnvest.eu, No date). Another example is Retenrgie in Italy (Becker & Kunze, 2014a, pp. 37–40.

[95] Oceransky, 2016; Avila-Calero, 2017, pp. 1002–1004.

[96] Ricardo Energy & Environment, 2017, p. 15.

[97] Meacham, 2012, p. 14.

[98] Angel, 2016a, p. 14.

[99] As Angel notes, "Co-operatives are still, in a sense, a form of private control" (Angel 2016a, p. 14.

[100] IRENA, 2018, p. 5.

101 Simcock et al., 2016, p. 17.

[102] McHarg, 2016, p. 5.

[103] Department of Energy et al., 2017, pp. 12; 44.

[104] Roberts et al., 2014, p. 10.

[105] Roberts et al., 2014, p. 34.

[106] Simcock et al., 2016, p. 74.

[107] Capener, 2014, p. 5, argues that government support must be "clear and strong".

[108] IRENA, 2018, p. 5; Roberts et al., 2014, pp. 44–45; Simcock et al., 2016, p. 75.

[109] Simcock et al., 2016, p. 29; German Federal Ministry, 2016, p. 39; Ricardo Energy & Environment and Ecologic Institute, 2016, p. 4.

[110] IRENA, 2018, p. 4.

[111] Ricardo Energy & Environment, 2017, pp. 9–10.

[112] Roberts et al., 2014, p. 49.

[113] Meacham, 2012, p. 15.

[114] Ricardo Energy & Environment, 2017, p. 25.

[115] IRENA, 2018, p. 6.

[116] Roberts et al., 2014, p. 51.

[117] Roberts et al., 2014, p. 49.

[118] Roberts et al., 2014, p. 65.

[119] Roberts et al., 2014, pp. 65–66.

[120] Simcock et al., 2016, p. 22. A similar policy operates in Spain.

[121] Roberts et al., 2014, pp. 66–67.

[122] Roberts et al., 2014, p. 68.

[123] Roberts et al., 2014, p.59.

[124] Roberts et al., 2014, p. 38.

[125] Simcock et al., 2016, pp. 10–14.

[126] Becker, 2017.

[127] Meacham, 2012, p. 16.

[128] IRENA, 2018, p. 6.

[129] Ricardo Energy & Environment and Ecologic Institute, 2016, p. 7.

[130] Simcock et al., 2016, pp. 54–59.

[131] Simcock et al. 2016, pp. 70–71.

[132] Ashden.org, 2010.

[133] Simcock et al., 2016, p. 79.

[134] Becker & Kunze, 2014b, pp. 181–183.

[135] McHarg, 2016, p. 13.

[136] McHarg, 2016, p. 16.

[137] Department of Energy et al., 2017, p. 39.

[138] BBBEE is a form of economic empowerment which is designed to advance economic transformation and enhance the economic participation of black people in the South African economy.

[139] Montmasson-Clair & das Nair, 2015, p. 15; Baker & Sovacool, 2017, pp. 4–8.

[140] See, for example, http://amtc.mandela.ac.za/Short-Courses/Renewable-Energy-Short-Courses; http://www.ce.up.ac.za/Course?tabid=58&Course=76f445a2-5cab-e311-9435-005056b26505; http://www.solarcourses.co.za/. Accessed 14 March 2018.

[141] See, for example, http://maxx-energy-academy.org/. Accessed 15 March 2018.

[142] Chambers, 2017.

[143] http://www.sarebi.co.za/. Accessed 22 March 2018.

[144] Montmasson-Clair & das Nair, 2015, p. 2; Baker & Sovacool, 2017, p. 8.

[145] Some argue that if Eskom was properly run in the public interest then separation would not be necessary. See AIDC 2017.

[146] http://www.eskom.co.za/OurCompany/CompanyInformation/Pages/Business_Vision.aspx. Accessed 8 August 2018.

[147] The term "state capture" refers to a form of systemic political corruption in which private interests influence a state's decision-making processes to their own advantage. Eskom has been at the heart of state capture since at least 2010. See, Eberhard & Godinho, 2017.

[148] See Department of Environmental Affairs. 2015.

[149] NPC 2018. The National Planning Commission (NPC) advises government on cross-cutting issues that influence the longterm development of South Africa. The NPC comprises of 24 part-time external commissioners, a chair person and a deputy chairperson appointed by the President. See, http://www.nationalplanningcommission.org.za/Pages/default.aspx. Accessed 14 March 2018.

[150] Undated letter from Jeff Radebe, Minister in the Presidency: Planning, Monitoring and Evaluation, to invited participants sent early in 2018.

[151] It was announced on 9 March 2018 that all unsigned commitments would be signed on 13 March 2018 (Slabbert, 2018). The process was stalled on 12 March 2018 by a court interdict lodged by the National Union of Metalworkers of South Africa, which was later set aside. On the 4th April 2018, after years of delays, these outstanding 27 PPAs with the RE IPPs were finally signed (Creamer, 2018).

[152] Groenewald, 2017; Omarjee, 2018; Alfreds, 2018.

[153] It is highly likely that the move away from FiTs have been as much to do with austerity measures post-2008 than with any desire to increase competition in the RE sector.

[154] See, Fakir, 2018.

[155] Roberts, 2014, p. 49.

[156] The current litigation around the City of Cape Town's desire to purchase electricity from independent power producers is likely to produce some policy clarity in this area. See Yelland, 2017.

[157] Baker, 2016, p. 17.

[158] Cohen, 2017.

[159] Stats SA, 2017a.

[160] Stokvels are community-based credit unions or saving schemes where members contribute fixed sums of money to a central fund on a weekly, fortnightly or monthly basis. They are generally established to meet specified social and economic goals – individual, or community-wide goals.

[161] Halsey, 2018.

[162] NUMSA, 2018.

[163] 'COSATU, 2018.

[164] Morris, 2017.

[165] Angel, 2016a, p. 4. Emphasis added.

[166] groundWork,2011, p. 43.

[167] https://www.energyjustice.eu/; https://www.energyjustice.net/. Accessed 14 March 2018.

[168] See Chiponda, Guerrero & Hargreaves, 2016.

[169] For example see Wampler, 2012.

[170] The timeframe for local stakeholders to own the majority of the project would depend on the project details, but between 5 and 10 years seems reasonable guideline.

[171] Quoted in Wlokas ,2017, p. 37. See also IRENA, 2018.

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