
‘YOU CAN’T EAT ELECTRICITY’

Why tackling inequality and hunger should be at the heart of low carbon development in South Africa

South Africa, like many middle income countries, is facing the challenge of pursuing low carbon policies in the context of high levels of inequality and persistent hunger and malnutrition. High and rising food and electricity prices are exacerbating inequalities, and leave too many people to choose between using scarce household budgets for food or for electricity. A key question for low carbon development is how to reduce greenhouse gas emissions whilst reducing inequality and food insecurity. This discussion paper considers how putting inequality and hunger at the heart of the low carbon development agenda in South Africa could also help to mobilize new constituencies of political support for low carbon action, which could be critical if vested interests in the carbon-based, energy-intensive economy are to be overcome.

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ABBREVIATIONS

ANC	African National Congress
BEE	Black economic empowerment
BRRR	Budgetary Review and Recommendation Report
COGTA	Cooperative Governance and Traditional Affairs
CPI	Consumer Price Index
DEA	Department of Environmental Affairs
DoE	Department of Energy
DPME	Department of Performance Monitoring and Evaluation
EGI	Electricity Governance Initiative
EIUG	Energy Intensive Users Group
EJN	Economic Justice Network
FBAE	Free Basic Alternative Energy
FBE	Free Basic Electricity
GDP	Gross Domestic Product
GHG	Greenhouse gases
IEP	Integrated Energy Plan
IPAP	Industrial Policy Action Plan
IRP	Integrated Resource Plan
LCOE	Levelized cost of electricity

LTMS	Long-term mitigation scenarios
MCA	Multi-criteria analysis
MYPD3	Multi Year Price Determination 3
NCCRP	National Climate Change Response Policy
NDP	National Development Plan
NEES	National Energy Efficiency Strategy
NFSD	National Framework for Sustainable Development
NERSA	National Energy Regulator of South Africa
NGP	New Growth Path
NPC	National Planning Commission
PPI	Producer Price Index
NSSD1	National Strategy for Sustainable Development and Action Plan
NUMSA	National Union of Metalworkers of South Africa
NWA	National Water Act
NWRS	National Water Resource Strategy
PPD	Peak, plateau and decline
REIPP	Renewable Energy Independent Power Producer Procurement programme
SAFCEI	Southern African Faith Communities' Environment Institute
SALGA	South African Local Government Association
SWHs	Solar water heaters
UNFCCC	United Nations Framework for Convention on Climate Change
WTO	World Trade Organization

1 INTRODUCTION

The impacts of climate change on food production, livelihoods and hunger are becoming increasingly clear. In South Africa, Oxfam has worked with partners to document the way the shifting seasons are already making it difficult for small-scale and large-scale farmers alike to adapt (Oxfam, 2011a). Climate projections for the Southern African region suggest alarming declines in crop growing periods unless urgent action is taken to slash global greenhouse gas emissions (Thornton, 2010; Lobell, 2011).

Developed countries are overwhelmingly responsible for causing this crisis, and have most capacity to respond to it. But due to their collective failure to keep the commitments they have made under the UN Framework Convention on Climate Change (UNFCCC) over twenty years, it is now imperative that all countries take some action to reduce emissions, particularly those middle-income countries like South Africa where emissions are relatively high and rising.

This presents a challenge, because today the majority, and a growing number, of the world's poorest people live in middle-income countries which, like South Africa, are marked by very high levels of inequality (Sumner, 2012). Perhaps the most shocking expression of such inequality is the prevalence of hunger and food insecurity among conditions of plenty.

The percentage of households in South Africa that experienced hunger halved between 2002 and 2007, from 23.8 percent to 10.5 percent, and increased to 11.5 percent in 2011; 21.2 percent of households in 2011 had limited access to food. This is worse in certain areas, notably in the North West province, where 32.9 percent had inadequate or severely inadequate food access.¹

How can greenhouse gas emissions be reduced in such circumstances while reducing inequality and food insecurity? Policies are needed that ensure that any burden from cutting emissions is borne by those with most responsibility and capacity, and do not exacerbate inequalities or lead to greater food insecurity for those on low incomes. At a minimum, low carbon development should complement and not harm the ongoing struggles for equality and rights, not least the right to food.

This discussion paper is a contribution to the debate on low carbon development in South Africa, and argues that putting the fight against inequality and hunger at the heart of low carbon development can also give a shot in the arm to the politics of climate change in countries like South Africa.

South Africa has shown significant leadership as a middle-income developing country in international climate change policy, and has committed to a set of goals for action on climate change which are ambitious by international comparison. But like many countries, from Mexico to the EU, this leadership has to date largely rested on high-level political will and the drive of a relatively small group of enlightened elites and technocrats.

With the appetite for international climate change debate slowing in the years since Copenhagen, it is now proving more difficult to successfully and fully implement such political commitments in the absence of broader-based domestic constituencies of support. In South Africa, an extensive policy agenda is running into delays in implementation and delivery, and measures designed to address inequities in energy use are proving inadequate.

Up to 10 million South Africans are vulnerable to food insecurity, where a small change in circumstances can bring about hunger. Malnutrition and stunting of children is still prevalent, especially in the rural areas, where hunger is a daily experience.

Tina Joemat-Petterson, Minister of Agriculture, Forestry and Fisheries¹

Unblocking progress is no easy task. South Africa's political economy is dominated by powerful vested interests in the carbon-intensive mineral–energy complex. This paper argues that challenging these power dynamics in order to ensure a more equitable and pro-poor low carbon economy requires that new political constituencies and narratives be built.

The case for low carbon policies is often made by anti-poverty and human rights advocates primarily on the grounds that climate change poses a severe threat to poverty reduction and equality. The final section of this paper outlines options for building a politics of low carbon development that may instead be predicated on direct positive benefits of low carbon policies for people in poverty, and especially for the fight against inequality and hunger.

Putting the fight against inequality and hunger at the heart of the low carbon agenda in South Africa can help to tackle climate change and build the broader base of popular support needed for such a transformative political agenda.

2 FIGHTING HUNGER AND CLIMATE CHANGE IN AN UNEQUAL COUNTRY

South Africa has one of the highest levels of income inequality in the world. According to a 2011 report from the National Planning Commission (NPC), the poorest 20 percent of the population earns just 2.3 percent of national income, while the richest 20 percent earns about 70 percent. Economic disparities have worsened since the transition to democracy, with South Africa's Gini coefficient² increasing from 0.64 in 1995 to 0.69 in 2005 (Van Der Westhuizen, 2011).

South Africa's National Development Plan 2012 proposes that GDP per capita should more than double between 2013 and 2030 with annual growth of 5.4 percent. However, the proportion of income earned by the poorest 40 percent of the population is only projected to rise by 4 percent compared with today and the Gini coefficient to only reduce to 0.6 – still among the highest anywhere in the world.

The incomes of the richest South Africans put them among the richest people in the world, but poverty and hunger persist, in spite of the country's high agricultural productivity. In a country which produces 600 grams of starchy foods, 300 grams of fruit and vegetables, and 150 grams of meat and fish per person per day,³ more than 10 million South Africans are food insecure, while 18 percent of children under 5 are stunted due to malnutrition. Access to food is not hindered by a lack of food, but by the low incomes of people living in poverty and the high food prices they face (Joubert, 2012; FoodBank South Africa, 2013).

Climate change poses an additional threat to food security in South Africa, particularly for people on low incomes in rural areas where poverty and food insecurity are highest. Rising temperatures and changing seasons are already hitting the productivity and livelihoods of small-scale and large-scale farmers alike (Oxfam, 2011a), and as climate change gathers pace, the impact on global and local food prices is set to be severe (Oxfam 2011b, 2012).

Reductions in global greenhouse gas emissions, particularly from the burning of carbon-based fossil fuels, are thus an urgent and imperative part of the fight against hunger and food insecurity. Due largely to the failures of developed countries since the 1992 UN climate change convention to lead the fight against climate change, all countries must now contribute to this effort, not least, middle income countries like South Africa.

This presents a challenge because the major, and a growing, proportion of the world's poorest people now live in middle income countries that, like South Africa, are marked by high levels of inequality (Sumner, 2012). The key question, then, is how and where to make emissions cuts within these economies fairly and equitably, so as to narrow and not exacerbate inequality and to complement and not undermine the fight against poverty and hunger?

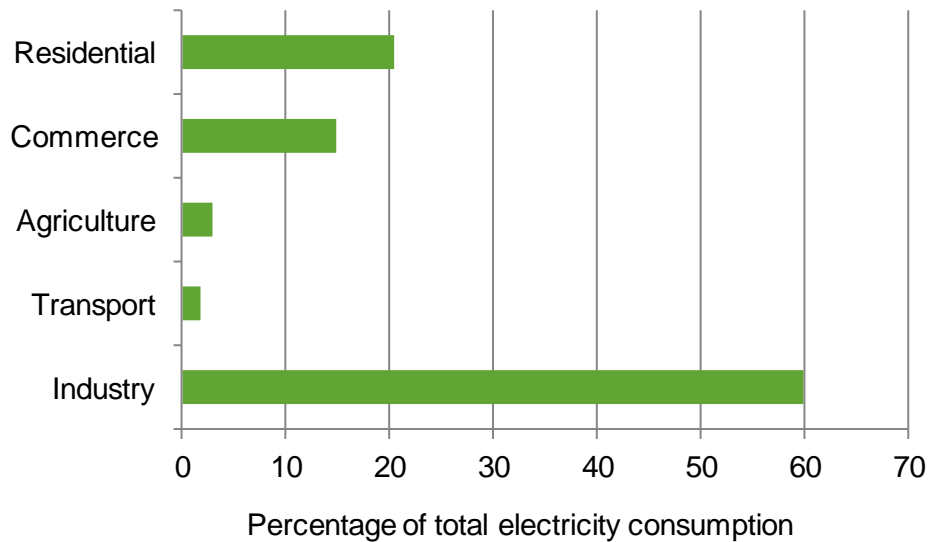
Inequality in energy use and responsibility for carbon emissions

Since 1882, with the electrification of the mining town of Kimberley, the South African economy has relied on cheap sources of electricity. Extractive mineral-based economic growth remains at the heart of the economy today, with the continued exploitation of mineral wealth requiring large amounts of power. The 2013 national budget emphasises the need for capital investment in infrastructure, a large proportion of which is to be directed to the state utility Eskom to strengthen its electricity capacity (Gordhan, 2013).

This development model means that responsibility for South Africa's carbon emissions is not shared equally across the economy, but concentrated in the power sector and in the households of the wealthiest sections of the population.

South Africa's total greenhouse gas emissions are 461 million tonnes CO2 equivalent (DEA 2010), putting it in the top 20 highest emitting countries, with per capita emissions twice the global average (Wakeford, 2008). The energy sector is responsible 83 percent of these emissions (DEA, 2010), the vast majority of which – about 82 percent – are from electricity production. Commerce and industry use 75 percent of South Africa's electricity with the residential sector taking only 20 percent (DOE 2009). Figure 1 shows electricity demand for different sectors (DoE 2009).

Figure 1: Final consumption of electricity by sectors (2006)

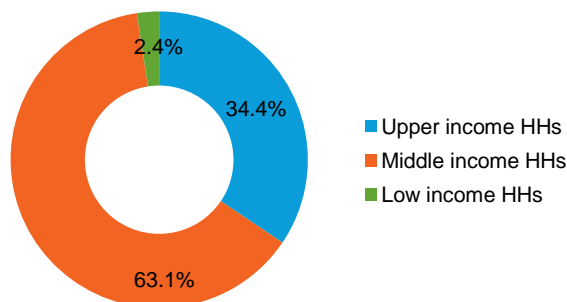


Source DoE 2009

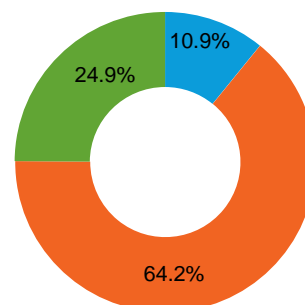
The residential share of 20 percent is concentrated in the hands of the wealthy. Figure 2 shows that while low income households make up 25 percent of the population, they only use 2.4 percent of the electricity. High income households are less than half in number but use 14 times as much (adapted from Tait & Winkler, 2012).

Figure 2: Electricity use in households of different income groups

Electricity use per household income group



Number of households



Source: adapted from Tait & Winkler, 2012

Many households have no access to electricity at all. Targets for universal access have been set, including increasing access to electricity for 92 percent of households by 2014 (DPME 2012). But while the formal electrification rate rose from 76.8 percent in 2002 to 82.7 percent in 2011 (Statistics SA, 2013), this masks big differences between regions (Statistics SA, 2011).

Furthermore, this indicator is based on an assumption that if you have access to electricity you can afford to use it. In practice, as electricity prices have risen, many residents have been forced to turn to other fuels or to cut back on energy use (Hallowes et al, 2007; EGI, 2013),⁴ which means they are excluded from the developmental benefits electricity can bring. As with access to food, high prices are a key driver of inequality in the use of electricity.

High and rising electricity prices widen inequalities and threaten food security

It is clear to see why rising food and electricity prices hit the poorest hardest by comparing the proportion of income spent on food and electricity. For the poorest 10 percent of households in South Africa, combined spending on food and electricity amounts to almost 40 percent of their total income, compared with less than 7 percent for the richest. Similarly, women spend more of their income on these two items than men, and black and coloured people spend more than white people (Statistics SA, 2012).

Table 1: Proportion of income spent on food and electricity by selected population groups

	Percentage of income spent on food	Percentage of income spent on electricity, gas and other fuels
Lowest decile	32.7	6.4
Highest decile	4.5	1.7
Black African	16.8	3.1
Coloured	16.4	3.3
White	5.2	2.0
Female	17.7	3.2
Male	11.1	2.4

Source: Stats SA, *Income & Expenditure Survey 2010/2011*
<http://www.statssa.gov.za/Publications/P0100/P01002011.pdf>

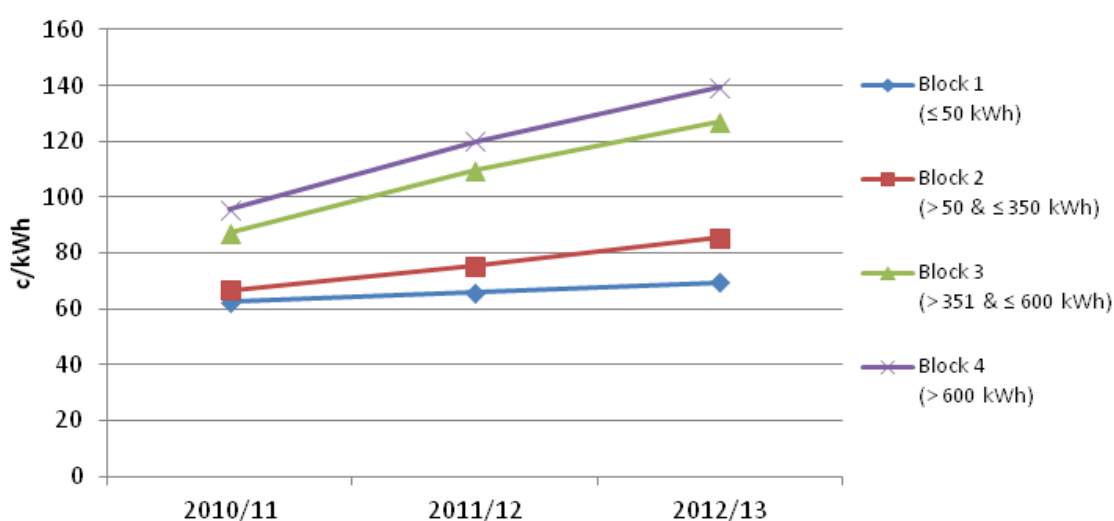
Over the past decade wholesale wheat and maize prices have increased dramatically (FAO GIEWS), at the same time as South Africa has experienced incessant increases in electricity prices.

Table 2 shows increases in average electricity prices charged by state monopoly power utility Eskom since 2006, and Figure 4 shows the increases in Eskom's 'Homelight' tariff, which can be treated as a reasonable proxy for tariffs paid by low-income customers. With the exception of Block 1, these all represent annual increases above inflation. In 2013 Eskom applied for a further 16 percent tariff increase, causing outrage among the public and civil society groups, before the increase was reduced to 8 percent by the National Energy Regulator of South Africa (NERSA).

Table 2: Trends and patterns: Eskom price history (NERSA, 2012)⁵ – multi-year price determination decisions (MYPD)

	2006	2007	2008	2008 (revised Dec 2007)	2008 (revised March 2008)	2009	2010	2011	2012	2012 (revised March 2012)
Average price increase (%)	5.1	5.9	6.2	14.2	27.5	31.3	24.8	25.8	25.9	8
Average price (c/kWh)	17.91	18.09	18.27	22.61	25.24	33.14	41.57	52.30	65.85	60

Figure 3: Eskom ‘Homelight’ Residential Electricity Tariff increases 2010–2013



Source: Author's compilation from <http://www.eskom.co.za/c/article/141/tariff-history/>

Such price rises are likely exacerbate income inequality (Walsh, 2012) and result in tough choices for people on low incomes. The 2013 NERSA hearings on the proposed electricity price rise provide anecdotal evidence of the detrimental effects of higher electricity prices on household consumption, and its potential bearing on food consumption in particular.

Further research is needed to understand the possible substitution effects of electricity price rises on food consumption at the household level. Some of the potential spill-over effects of rising electricity prices are shown by 'Busi's story' in Box 2.

Several testimonies at the NERSA hearings were also concerned about the knock-on effect of higher electricity prices on food prices. For example, National Union of Mineworkers of South Africa (NUMSA) Secretary, Irvin Jim, warned that the increase would lead to higher prices for food and other consumer goods (SABC, 2013). This linkage between food and electricity prices has been described in press reports over the last three years (Payne 2011; Dube et al 2012; Mukaddam, 2013), although there has been little academic research to date on the issue.

Many nights we go without electricity because you must decide between that and food, and you can't eat electricity.'

Mastoera Collop
(Nicholson 2013).

It may be possible to estimate the extent of the impact of rising electricity prices on food prices at a macro-level, all other things being equal. Electricity costs are weighted at around 7 percent in the South African Producer Price Index (PPI), and production

costs can reasonably be assumed to account for around 60 percent of retail prices in the Consumer Price Index (CPI) (Wakeford, 2008). Food is the biggest single item in the CPI basket for the poorest households, so any increases in the CPI driven by rising electricity costs can be assumed to have a negative impact on food security.

By way of comparison, petrol prices are weighted at 5 percent in the PPI, suggesting that rising electricity prices will have a more dramatic impact on food prices than the oil price, the food security implications of which are more established in the literature (Fofana, 2012).

Tackling inequality and hunger should be at the heart of low carbon development in South Africa

It is imperative that any agenda for low carbon development must be developed in the context of these stark inequalities in income, energy use and responsibility for emissions; of rising prices for food and electricity; and the implications this entails for food security and hunger in South Africa.

Measures to restrict the use of fossil fuels in order to lower carbon emissions are often expected to increase energy and electricity prices, including those paid by people on low incomes (Wakeford, 2008). If this happens, pursuing a low carbon agenda will have major implications for equality and food security unless policies are designed with appropriate measures to protect people on low incomes. Alternatively, focussing on expanding affordable low carbon energy for people on low incomes can help to tackle both inequality and food security concerns.

But putting the fight against inequality and hunger at the heart of a low carbon agenda is not just about ensuring that low carbon policies complement rather than harm existing struggles for rights. It can also help with the politics of low carbon action in South Africa. If policies are designed and political narratives constructed which present low carbon policies as contributing to efforts to tackle inequality and food insecurity, powerful new domestic constituencies of support for low carbon development could be built. Such support could be vital to unblocking progress on the implementation of low carbon policy.

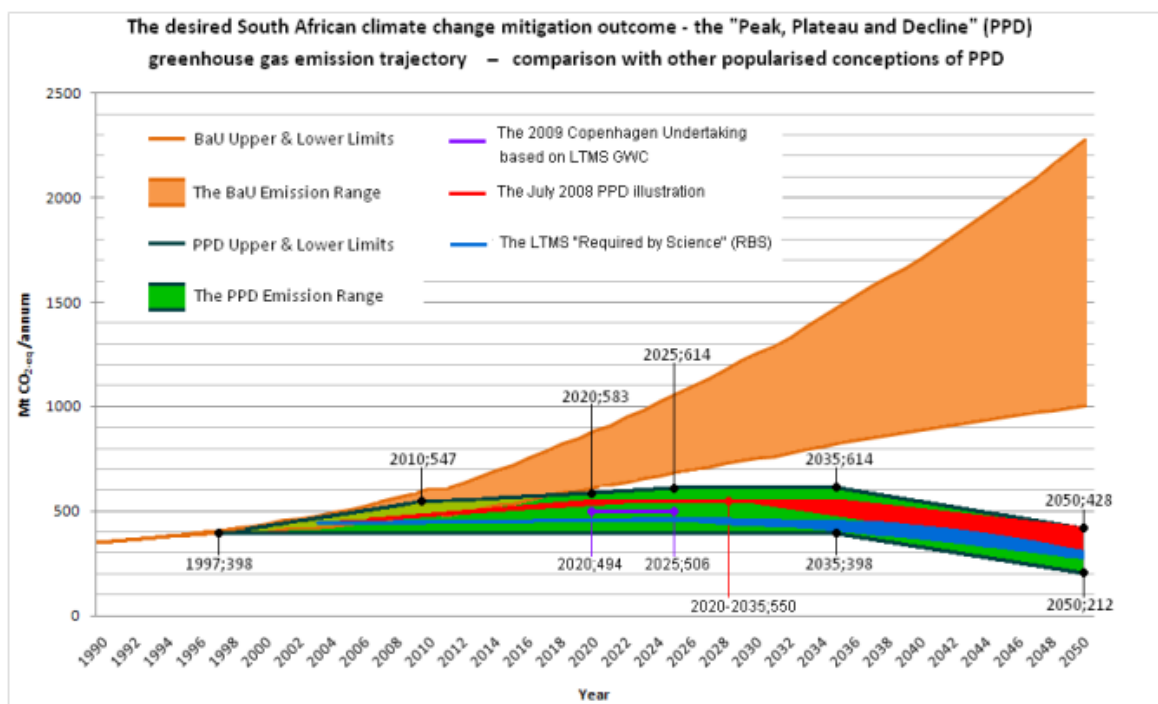
3 HIGH AMBITIONS FOR EMISSIONS CUTS ARE NOT ON TRACK

South Africa has played a leading role on the international stage in efforts to reduce global greenhouse gas emissions. But this low carbon agenda, ambitious by international standards, is running into implementation difficulties, and its efforts to address inequity in energy and electricity use are proving inadequate.

An ambitious policy agenda

In 2007, South Africa produced the Long Term Mitigation Scenarios (LTMS) study. This showed how the country's emissions would quadruple by 2050 if business-as-usual continued, and set out a trajectory instead for emissions to peak between 2020 and 2025, plateau, and then decline after 2036.⁶

Figure 4: Peak, plateau and decline trajectory for greenhouse gas emissions



Source: DEA 2011

This has been South Africa's flagship emissions-reduction commitment in the international climate change negotiations at the UNFCCC, complemented by an array of domestic climate change mitigation strategy documents and plans, as reflected in Table 3.

Table 3: Major national climate change mitigation strategies and plans

Policy measure	Lead department	Description
The National Climate Change Response Policy (NCCRWP)	Department of Environment Affairs	Provides the South African government's vision for an effective climate change response and the long-term, just transition to a climate-resilient and lower-carbon economy and society. Commits all government departments to prepare a climate change response plan towards the achievement of the NCCRWP within 2 years (by 2014).
The National Development Plan Vision 2030	National Planning Commission in the Presidency	A flagship macro-level plan that envisages an economy that serves the needs of all South Africans.
The New Growth Path (NGP)	Department of Economic Affairs	A policy document that speaks most directly to the achievement of a low carbon economy through the promotion of the green economy – target of 300,000 green economy jobs by 2020.
The industrial plan (IPAP 2014)	Department of Trade and Industry	A diverse range of programmes/projects, some of which actively support the low carbon economy.
The Integrated Resource Plan (IRP2010)	Department of Energy	The national electricity supply plan to 2030, which outlines the proposed energy mix and energy efficiency targets.
The National Water Resource Strategy 2 (NWRSS2)	Department of Water Affairs	South Africa's strategy for managing its water resources to 2030.
National Strategy for Sustainable Development and Action Plan (NSSD 1 - 2011 – 2014)	Department of Environmental Affairs	Aims to initiate and upscale existing actions to achieve sustainable development.
Reducing Greenhouse Gas Emissions: The Carbon Tax Option (2010)	National Treasury	The Carbon Tax is proposed as a market-based instrument to induce behavioural changes that contribute to lower greenhouse gas emissions.

Source: Authors' analysis

Both the NDP and the NCCRWP have been adopted by government as national plans. In their compilation, they have drawn on the plans of all other government departments, and in producing them they attempted public consultation with a variety of stakeholders. Both profess to have a primary goal of benefiting all the people of South Africa, addressing inequality and trying to alleviate poverty. The National Development Plan (NDP) and the National Climate Change Response Policy (NCCRWP) to a greater or lesser extent therefore, speak to an

integrated approach to development and provide an overview of current government thinking, though policy inconsistencies have been noted by civil society groups (see Appendix A).

However, as stated earlier, 83 percent of South Africa's emissions are related to energy production (DEA 2011) and many of the policies and programmes initiated by different government departments are supportive of, and reliant on, the successful implementation of the policy measures of the Department of Energy (DoE). The DoE has primary responsibility for the two key emission reduction strategies identified as the most promising in the NCCRP (energy efficiency and demand-side management, and increasing investment in a renewable energy programme).

Delayed policy implementation

This policy agenda, ambitious by international standards, is being held back by delays in implementation and delivery.

In March 2012, the Department of Performance Monitoring and Evaluation (DPME) based in the office of The Presidency, released a high-level mid-term performance report on the country's progress. Successes listed relating to climate change included the cabinet approval of the NCCRP; the GHG emissions inventory; air quality improvements; the completion of the IRP2010; the installation of 200,000 solar water heaters; and the procurement of 1415MW⁷ of renewable energy.

However, during 2012 the DPME conducted performance audits of progress towards specific departmental targets which were then publicly reviewed by the relevant oversight committee in parliament, resulting in the Budgetary Review and Recommendation Report (BRRR).

The two key climate change mitigation policies of increasing the amount of renewable energy and increasing energy efficiency targets are largely dependent on the DoE's review of the current electricity generation mix (contained in the IRP2010), the publication of the Integrated Energy Plan (IEP), and the implementation of the National Energy Efficiency Strategy – all of which could potentially recommend policy shifts to reduce carbon emissions.

The overarching conclusion emerging from the BRRR report is that there are significant delays in the implementation of various energy policies that could mitigate climate change. Appendix B provides an overview of the BRRR report for these climate change policies implemented under the Department of Energy.

Although renewable energy was identified as having significant growth potential (DME⁸ 1998; DME 2004), it was only in 2009 that the government initiated the procurement of renewable energy via a feed in tariff (NERSA 2009). Inconsistency among government agencies and disputes over technical and legal procedures were eventually resolved with the establishment of the Renewable Energy Independent Power Producer Procurement Programme (REIPPP⁹) in mid-2011, ahead of the international climate change meeting in Durban in November 2011 (COP17), implementation is still at early stages..

The Solar Water Heater programme is rolling out much more slowly than anticipated, and the carbon tax draft policy published in 2010 has also been delayed and is now planned to be rolled out in 2015 (Gordhan 2013). The IRP2010 review has been delayed until 2014, and the energy efficiency target of 12 percent by 2015 remains voluntary (Fischer, personal communication with L. McDaid).

Despite South Africa's ambitious political commitments, therefore, it is not clear that the limited progress in implementing low carbon policies to date is sufficient to change the country's business-as-usual development path. SASOL (reputed to be the highest single point emitter in the world) which has committed to a 15 percent reduction in emissions intensity, saw its greenhouse gas emissions intensity actually increase in 2011/2012 from 2.99 to 3.02, and its

⁷'You Can't Eat Electricity'

⁸Why tackling inequality and hunger should be at the heart of low carbon development in South Africa

absolute emissions from 75,317 Kt to 76,370 Kt (SASOL, 2012). Of the five top emitters in the country, four increased their emissions from 2009 to 2011 (Urban Earth, 2012, Carbon Disclosure Project, 2011). Reversing these emissions trends will require a step-change in political commitment to ambitious low carbon policy implementation.

Existing measures to address inequity are inadequate

Some of the key measures the government has introduced to address inequities in energy and electricity use are proving inadequate.

Free Basic Electricity

In 2003, the government introduced an allocation of 50kWh electricity, which aimed to promote universal access to electricity for all by providing a limited amount for free – known as Free Basic Electricity (FBE).

In 2011 the formal electrification rate was approximately 83 percent, meaning that 17 percent of households go without any form of electricity access; but the total number of non-electrified households is estimated to be much higher, at approximately one-third of all households (Wolpe, Reddy 2010). Informal housing, particularly where people live in areas not zoned for settlement, such as on private land or floodplains, is not eligible for electricity access and falls outside any safety net.

In March 2012, Eskom, the Department of Energy, the South African Local Government Association (SALGA) and NERSA, reported to the national parliament on the progress of delivery of the FBE and Free Basic Alternative Energy (FBAE) policy measures. They estimated that in total 25 percent of indigent customers do not receive their free basic electricity (NERSA 2012, SALGA 2012 DoE, 2012). Box 2 provides a summary of the challenges identified.

Box 1: Challenges in the implementation of the Free Basic Electricity (FBE) policy¹⁰

- In some areas, there is a lack of institutional capacity to deliver FBE.
- Customers are not aware of the FBAE, which provides for alternative forms of energy for those who do not have electricity, nor do they understand the variety of possible technologies.
- Eskom and municipalities disconnect households and businesses to force them to pay for other services such as water and rates. If electricity is disconnected due to failure to pay for other services, they lose their FBE allocation for those months; there is no accumulation or carry-over to future months.
- The data regarding numbers of indigent households is poor: there are different policies in different areas, so it is difficult to establish accurate figures. Some local authorities apply FBE to all households, while some apply only to those on an indigent register.
- In cases where there are many houses on one site, the combined energy usage of the site exceeds that which qualifies for FBE and these households then do not receive FBE, despite individually being indigent.

Source: NERSA, 2012; SALGA 2012; DoE 2012

The use of FBE as a debt enforcement mechanism is a particular problem explored in Busi's story in Box 2. Further problems may be identified with regard to funding arrangements. Funding for FBE comes through the equitable share allocation from the Treasury, via the government department responsible for cooperative governance and traditional affairs (COGTA), to local government. However, budgetary allocation for FBE was based on 2001 census data. As the number of households has increased since then, the available allocation limits the total number of households that can be supplied.

With FBE measures inadequate, there is insufficient protection from rising electricity prices for people on low incomes.

Solar water heaters

The installation of solar water heaters (SWHs) helps to mitigate climate change by replacing existing carbon-based electrical geysers or kettles with solar energy, or replacing paraffin or other fossil fuels. For those who have no geysers, the installation of SWHs provides a new sustainable energy source.

SWHs – together with the installation of ceilings – can yield significant results, not only in energy and carbon emission savings, but also in health and well-being improvements (Wlokas 2010). As Kuyasa notes, *‘a significant indicator of the effect of the ceilings is that prior to the installation of ceilings 79 percent of households experienced illnesses twice a more a year, after the installation this figure dropped to 26 percent’* (Walsh et al, 2011).

However the implementation of the SWHs policy is clearly behind schedule. The target for 2014 is for one million installations, but according to the DoE, only 270,000 have been installed to date (DoE 2012). As a measure to address inequity in energy use while equitably reducing emissions, this policy is proving inadequate.

Box 2: Busi’s story: the impact of rising prices and inadequate policies on a low-income household

Busi is a single mother, and head of the household. She has a pre-paid electricity meter and lives in a local municipality-supplied area. She uses 200kWh of electricity per month, works part-time as a domestic worker and at night makes craftwork, which she sells at a local market at the weekend.

Although Free Basic Electricity (FBE) was approved in 2003, Busi did not receive FBE until the local government addressed the technical challenges of applying FBE to pre-paid meters in 2005. Due to the delays in implementing energy efficiency labelling for appliances, Busi does not have sufficient information to choose appliances that could save her electricity.

Between 2009 and 2012 average electricity prices doubled, but Busi’s income did not. The price of food and household expenses also rose.

In 2009, Busi received 50kWh free and bought a further 150kWh which cost her R74.19 (excl VAT). In 2013, Busi received her free 50kWh but was only able to buy 92kWh for her R74 available. With nearly 30 percent less electricity, Busi was not able to produce her craftwork and her income dropped. During this period, food prices rose, and Busi was unable to continue paying for her water. The council then cut off her electricity to force her to pay for her water. Busi was forced to rely on candles and paraffin to provide food and lighting, and the paraffin fumes resulted in one of her children developing asthma.

Busi does not receive FBE until she is able to pay off her water debts, and even then she will not receive the FBE she missed while she was cut off. If she is not able to pay off her debts, she can approach the council to wipe out her water debt and she will then be fitted with a water management device which will restrict her water flow to a minimum per day.

Source: Author’s analysis, based on tariffs from the City of Cape Town

4 A NEW POLITICS OF PRO-POOR LOW CARBON DEVELOPMENT IS NEEDED

What explains the apparent disconnect between the relative ambitions of the South African government to set a course of low carbon development, and its record of policy implementation and results? To a large extent, the answer lies in the imbalance of power between strong vested interests in the carbon-intensive economy, and the relatively small group of enlightened elites and technocrats which has driven the country's low carbon agenda to date in the absence of broad-based domestic political constituencies of support. A new politics of low carbon development is urgently needed, framed by popular concerns to reduce inequality and realise the right to food.

In South African politics, those arguing for a low carbon agenda are up against some formidable opposition – in a debate which goes to the heart of the country's model of development. Within the ANC, there is an increasing belief in a concept of the 'developmental state', and the importance of maximising use of the country's strategic natural resources, notably coal. For many, the coal industry is still seen as one of the best paths to Black Economic Empowerment (BEE)¹¹ The challenge this discourse poses to the low carbon agenda can be seen, for example, in the policy papers submitted to the ANC calling for the carbon tax proposal to be dropped.

The power of South Africa's mineral–energy complex is well-documented (Fine & Rustomjee, 1996; Winkler & Marquand, 2009; Greenpeace, 2012a). Cross-holdings by companies in both coal mining and energy-intensive industries – a common hedge against rising prices – ensures a firm grip by those industries on a carbon-intensive model of energy production.¹² Nowhere is this concentration of power in the energy system clearer than in the monopoly enjoyed by state energy utility Eskom, which operates with little transparency over key policy decisions, not least electricity pricing. All the major players in the sector have proved extremely successful in accessing and influencing political decision makers (EGI, 2010).

The privileged access of such interests to political power can be seen, for example, in the composition of a key advisory committee to the DoE on the Integrated Resource Plan (IRP) 2010, the members of which are listed in Box 3 (EGI, 2010). Membership is dominated by business interests, especially those associated with the Energy Intensive Users Group; no committee members have recognized expertise in poverty reduction or social impact; and there are no seats for civil society representatives.

Box 3: Members of advisory group to the Department of Energy on IRP2010

Kannan Lakmeerharan – state enterprise: Eskom systems operations and planning

Callie Fabricious – state enterprise: Eskom

Mike Rousouw – business: coal, Xstrata

Ian Langridge – business: coal, Anglo American

Brian Day – business: coal/RE, Exxaro

Piet van Staden – business: fossil fuels, SASOL

Kevin Morgan – business: smelters/coal, BHP Billiton

Paul Vermeulen – local government-owned company: City Power (Johannesburg)

Doug Kuni – business: SA Independent Power Producers' Association

Roger Baxter – business: Chamber of Mines

Shaun Nel – business: Project Manager, Gobodo Systems (who list Eskom as a client]

Source: EGI 2010

Local environmental groups have tried to exert political influence on this system. Many have been vociferous in demanding a scaling-up of renewable energy, for example in official inputs to policies like the IRP or through the National Energy Regulator of South Africa (NERSA) MYPD3 hearings, as well as through protest actions against coal and nuclear power. A wide range of civil society groupings including trade unions, faith-based organizations and community groups have released press statements opposing nuclear and promoting renewable energy (NUMSA 2012, SAFCEI 2013, EJM et al 2010).

The civil society constituencies active in this area tend to be divided between those who are chiefly concerned about increasing energy access for poor households for primarily social-development benefits, and those primarily concerned with shifting to a low carbon energy system to fight climate change and environmental degradation. What is clear, however, is that both groups face the same obstacles. The dynamics of the carbon-intensive mineral-energy complex keep energy prices high for poor households while ensuring that prices are low for energy-intensive industries; and at the same time drive greater inequality.

Capacity constraints in policy implementation within the South African government, particularly at municipal level, of course do not help (Davids, 2009). And the vacuum in industrial policy – a legacy of South Africa's entry into the WTO – limits the scope for promoting a domestic renewable energy industry similar to that followed in China to stimulate production of wind turbines, for example.¹³

But the implementation of a low carbon policy in any country is fundamentally a political question, not simply one of technical capacity or expertise. The prominence of climate change on the international agenda in the period leading to the Copenhagen climate change summit in 2009, and for South Africa through to the Durban conference in 2011, provided an impetus for political commitment to low carbon action from the highest political levels. But pressure from the international level has been dropping, while the power of the carbon-based energy-intensive constituencies in South Africa continues. It is clear therefore that advocates for climate change action can no longer rely on the influence of a few enlightened leaders or elites in order to make progress. In South Africa, as in many middle-income countries, broad-based movements are needed to shift the power of vested interests in the business-as-usual economy. To achieve the scale of mobilization needed, the fight for a low carbon future must be embedded in struggles for rights and equality. A pro-poor low carbon agenda is needed that does not just fight climate change, but tackles inequality and hunger too.

5. BUILDING A POPULAR PRO-POOR POLITICS OF LOW CARBON DEVELOPMENT

Work to make a new politics of low carbon development a reality is already underway in South Africa. Three avenues for further developing such a path are outlined below.

A new approach to social dialogue

Moving to a new pro-poor low carbon development model means challenging strong vested interests in the political economy of South Africa. This is likely to need new spaces to be opened up for a wide range of stakeholders to engage in a real dialogue on the direction of policy making and implementation. This was a core message from contributors to this paper. It is a challenge that should underpin all other efforts to change the politics of low carbon development in the country.

The National Planning Commission (NPC) consultation process over the National Development Plan (NDP) stands as an important precedent for such a social dialogue, and though criticised as inadequate, offers useful lessons, as noted in Box 4.

Box 4: Positive lessons from the NPC process

- Securing the confidence of participants was key, although it took a great deal of time and perseverance.
- The NPC team believed in the process, which gave them the determination to keep going.
- The team had flexible ways of working and were positive about the messy reality of the process and the opportunities presented.
- There were costs involved and special skills needed.
- The NPC was tactical: the team managed to get on the agendas of political elites and also engaged with households and religious institutions.
- The NPC process was driven from the top level of government, which provided legitimacy and meant the NPC benefited from broad support.
- There was a lot of commitment from the media, which helped with awareness-raising.

Source: Workshop with authors, government officials and civil society

The NPC is now ideally placed to assume a role as convenor of a continuous multi-level dialogue around an inclusive and sustainable development model for South Africa. But to do so, the NPC must make a compelling case about the value of such a process to colleagues in government, to civil society and to the private sector.

The dialogue should not be presented as another time-bound consultation on a particular document or policy, but conceived as a hub for ongoing social engagement of all stakeholders – from the most powerful to the most marginalized – aiming to facilitate the emergence of a new social compact. The National Development Plan, while technically ‘finished’, continues to be subject to serious criticism from some quarters. Dialogue and engagement with stakeholders is just as – if not *more* – important now to ensure that the plan is strengthened and improved to

the point where it can gain the full backing of society and drive the implementation of new policies for pro-poor low carbon development.

The NPC is likely to need the continued backing of the office of The Presidency for this task, to lend it the authority needed to engage actors across government and the private sector. For colleagues in government, many of whom may be fully committed to a more inclusive and sustainable development model but frustrated at the lack of opportunities for constructive engagement with wider political constituencies, this offers an opportunity to build support for the implementation of their work. For the private sector, it is an opportunity to strengthen their social licence to operate and could help them to understand and manage investment risk more effectively.

Critically, such a process must also reach out to civil society groups and citizens who are closer to impoverished communities and are not able to attend 'workshops' and 'consultations', to find ways to engage in dialogue that is accessible and meaningful to all. Key to this approach will be a feedback loop where citizens are regularly informed of policy developments and in turn able to inform policy makers of how policies are working on the ground.

The NPC will need to invest in a core dedicated team to design and manage such a dialogue, building their skills and backing them with appropriate resources and authority. Such a team should develop a clear methodology to guide its outreach and to structure the dialogue. It is particularly important to invest time in building the trust of and networks among civil society, marginalized groups, and especially among women. The approach needs to be flexible, reflexive and based on 'learning-by-doing'. A possible methodology could be a version of the multi-criteria analysis (MCA) approach suggested by Dubash, Raghunandan and Sreenivas to structure deliberation on the co-benefits of low carbon policies in India (Dubash et al., forthcoming).

The NPC has built a certain amount of good will among some stakeholders, and signalled the potential for a more inclusive model of policy making. But to ensure that this leads to a new development model for South Africa, the real work of social dialogue must start now.

A campaign for a progressive carbon tax

The government's proposal for a carbon tax offers a major opportunity to design a policy that not only helps to drive down greenhouse gas emissions, but is also a tool of economic redistribution and empowerment. But this will only happen if political constituencies mobilize to demand it. A campaign is needed for a progressive carbon tax that could become an iconic example of how a low carbon agenda can support the fight against inequality and hunger.

There is no question that the establishment of a comprehensive carbon tax in South Africa would be a powerful example for other developing countries in the fight against climate change, but there is a real risk that the policy may never make it onto the statute book unless new political constituencies emerge to fight for it.

The government's original discussion paper on the policy was published more than two years ago. It noted the need to design the tax to take account of potentially regressive impacts on low-income households and potentially negative impacts on industrial competitiveness (Treasury, 2010). Following Finance Minister Gordhan's announcement in 2013 that the tax will be rolled out in 2015, the next 18 months are a pivotal period for stakeholders to engage in shaping the design and ensuring the implementation of the policy.

Just as in the frantic lobbying that took place in the EU and in Australia ahead of the introduction of carbon pricing instruments there, there is no question that energy-intensive industries in South Africa will mobilize all of their extensive lobbying resources to either block the policy or for extensive relief measures that will reduce its effectiveness as a tool of

environmental policy and reduce the scale of overall revenues that would be generated for public goods.

Civil society should not leave the polluters to have this debate with government alone, but should organize to stake their claim to the revenues that could be generated. A strong moral and political case can be made, based on the 'polluter pays' principle. Rough calculations would indicate that recycling revenues from a carbon tax on an equal-per-household basis would be a highly progressive measure: those with least responsibility for emissions would become net beneficiaries (receiving more in recycled revenues than they would pay in higher energy and other costs), while those with most responsibility for emissions would become net contributors (paying more in higher energy costs than they would receive in recycled revenues) (based on Wakeford, 2008). This would be an effective means of redistributing income from high-income, high-emitting households to low-income, low-emitting ones.

Boosting the incomes of low-income households in this way is also one of the surest ways of fighting hunger, as shown by the Brazilian experience of the introduction of the *Bolsa Familia* – a conditional direct social payment to low-income households. This, along with a suite of other policies, helped to cut hunger by a third in Brazil between 2000 and 2007.

A number of forms of recycling revenues to benefit lower-income households are possible, and each have their respective merits that will require further assessment. But before engaging in technical discussions over detailed policy design, the key job of civil society in the next 18 months should be to shape the political debate about who should benefit from the introduction of a carbon tax, at approximately what scale, and for what purposes.

By making a strong political case that the carbon tax can not only help to fight climate change, but also redistribute resources within South African society in the fight against hunger, new constituencies of support for a progressive policy could emerge. That support will be vital if a carbon tax is to be successfully introduced by 2015; one designed not only in the interests of high-income high emitters, but also low-income low emitters.

Reframing renewable energy as a tool to fight hunger and inequality

South Africa has an abundance of potential for renewable energy, but in spite of the government's ambitions to increase capacity significantly, renewable sources could be just 9 percent of the country's energy mix by 2030.

The Renewable Energy Independent Power Producer procurement process (REIPP) offers a real opportunity to increase the share of South Africa's energy coming from renewable sources by breaking down the concentration of power in the country's energy sector. Certainly some technical problems with REIPP need fixing if it is to realise this potential, but the fundamental issue driving the take-up of renewable energy is the government's projections of the share of renewable energy in the electricity supply plan (IRP2010). After a two year delay, this is now set to be reviewed in 2014, offering a key opportunity to press for a greater share of renewables in the mix.

The jobs argument for renewable energy has already been made persuasively by many civil society groups. For example, Greenpeace has compared its 'Energy [R]evolution Scenario' with the government's Integrated Resource Plan, concluding that a scaled-up renewable energy roll-out could create an additional 149,000 jobs by 2030 (Greenpeace, 2011). The Million Climate Jobs campaign sees jobs potential on a similar scale from a range of initiatives, including 150,000 from wind and solar energy alone and about the same number from work on energy efficiency and reducing energy use.

A less-explored but powerful case can also be made by civil society and the renewable energy industry on the basis of the food security needs of the country, on the grounds both of electricity prices as explored earlier and of water usage.

The DoE process that led to the IRP2010 included an analysis that weighted various scenarios of energy mix against a range of criteria, including carbon emission reductions, electricity prices, water consumption, various dimensions of risk, localization benefits and regional development (DoE, 2010). In the review of the IRP, there is a case to revisit both the data used to estimate the future electricity price curves, and also the weighting afforded to the consideration of water use, on the grounds that they are critical issues for tackling hunger.

Table 4 provides an indication of how renewable technology prices have been rapidly decreasing since 2010. The REIPP procurement process was designed to run in a number of successive windows, and the price that was accepted by the DoE in the two windows so far provides a real-time snapshot of renewable energy prices.

Table 4: REIPP bid window price differences from 2011 to 2012

Technology	Average price bid window 1 (Nov 2011)	Average price bid window 2 (March 2012)
Solar PV (Photo Voltaics)	R2.75 /kWh	R1.65 /kWh
Concentrated Solar Power	R2.68 /kWh	R 2.51 /kWh
Wind	R1.14 /kWh	89c/kWh

Source: DoE 2012

The levelized cost of electricity (LCOE) for wind in South Africa is 89c/kWh and now compares more favourably with the Medupi coal fired power station, which is currently estimated at 97c/kWh (Mulcahy 2012).

A key element of civil society support for renewables and opposition to nuclear and coal has been that renewables provide more affordable electricity prices into the future. But the assumption that renewable energy is a more expensive alternative to ‘cheap’ coal is engrained in South African political culture.¹⁴ Given the significant welfare impacts of high and rising electricity prices, efforts should be made to reach out to new coalitions of civil society across the environmental and social spectrum to further press the affordability case. Climate change mitigation is an essential co-benefit, but to inspire a broader coalition of support for replacing fossil fuels with renewable alternatives, price can be a simple transformative message that relates to the everyday struggles of people on low-incomes here and now.

Activists for both renewable energy and those fighting for food security for all in South Africa, should argue for greater weight to be accorded to the water consumption of proposed energy mix scenarios in the IRP review. In IRP 2010, water use was accorded the *lowest* weighting of the seven criteria (IRP, 2010) despite the grave challenges that water scarcity poses to food security in a warming world, especially in a water-scarce country like South Africa. The energy mix scenarios with the highest proportions of renewable energy had the best scores for water consumption of all the options.

One of the many things I learned as president was the centrality of water in the social, political and economic affairs of the country, the continent and the world’.

Former President Mandela

The National Water Resource Strategy (NWRS) of 2012 (DWA 2012) confirms that water for power generation is a strategic use and therefore should be prioritized, despite the claim of the National Water Act (NWA 1998) that water for human requirements is paramount. Although the NWRS acknowledges that South Africa is already a water-scarce country and that climate change will have an impact on water availability, the technical strategy for climate change refers to another Water Sector Climate Change Response strategy which is not yet finished. Overall, and despite some notable interventions (for example, Greenpeace, 2012b; WWF SA, 2011) the profile of water in the energy sector is still far too low.

That must change, given the grave implications of water scarcity for food security in South Africa. While agricultural land accounts for 82 percent of the country’s total land area, only 1.3

‘You Can’t Eat Electricity’
Why tackling inequality and hunger should be at the heart of low carbon development in South Africa

percent is under irrigation, mostly for large-scale commercial farms, with the remainder dependent on rainfall (Findlater, 2013). Expanding irrigation, especially for smallholder farmers, is essential to the country's food security, yet there is already little capacity to increase water use for irrigation to help farmers adapt to the increased evapo-transpiration and heat stress associated with climate change. Small-scale farmers will suffer the worst impacts, yet their voices and rights are little heard in the debate on the country's energy future.

Focusing on the excessive water needs of producing energy from fossil fuels compared with renewable sources, and particularly on what this means for small scale farmers in their efforts to adapt to climate change, is a powerful argument that could help to engage new constituencies concerned with food security in rural areas in the debate over the country's energy mix.

Water efficiency measures are being put in place for poor households,¹⁵ while the thirstiest form of power generation wins favour in the IRP. When millions of people in rural areas of South Africa are malnourished, and small scale farmers face the added burden of climate change, pouring water into power plants instead of onto the soil to grow crops is an injustice that should be put at the forefront of the debate on the IRP review.

CONCLUSION

In a middle-income country where the richest one percent of the population are part of the richest one percent of people in the world (Milanovic, 2012), far too many people in South Africa are forced to choose between using scarce household budgets for food or electricity. As climate change gathers pace, the implications for agriculture and food security in the region are dire and the need for all countries to act to cut emissions is increasingly pressing.

South Africa has played a leading role in many ways in the international debates on climate action, and has put forward a range of policies and plans for low carbon action. But in the context of powerful vested interests in the carbon-based, energy-intensive economy, successful implementation of this policy agenda is proving a real challenge.

Those concerned with promoting a low carbon development agenda in the country can no longer rely on the pressure from the international climate change negotiations to see progress made. New domestic constituencies of political support are needed, broad-based and powerful enough to challenge those with a stake in the status quo.

This paper has argued that one route towards such mobilization is to embed the low carbon development agenda within the struggles to tackle inequality and hunger in South Africa, suggesting three avenues to start to pursue such a pro-poor politics of low carbon development.

1. A new approach to social engagement is needed that will enable those on the lowest incomes and facing the greatest political marginalization to participate in national policy making around sustainable development. This could be led by the National Planning Commission.
2. A campaign for a progressive carbon tax to be implemented in 2015, the revenues of which should be recycled on an equal-per-household basis. This would be a tool of economic redistribution to narrow income inequalities and to boost the incomes of people facing food insecurity.
3. New constituencies of support for renewable energy could be built by showing its benefits for fighting inequality and hunger, in terms of its promise of both lower consumer prices and greater water security, particularly for small scale farmers.

While the post-apartheid mineral–energy complex creates a political-economic context that is particular to South Africa, the challenge of pursuing low carbon policies in the context of high degrees of inequality and hunger is one that many middle-income countries increasingly face.

A better understanding of the relationship between low carbon action, inequality and hunger is thus imperative. It could help to build a vision of sustainable and inclusive development that could mobilize the new political constituencies needed if we are to transform the social, economic and ecological destinies of our societies and our planet.

APPENDICES

Appendix A: Extracts from the civil society submission to the National Development Plan (May 2012), showing the views expressed by civil society organizations and the responses contained within the NDP.

Civil society analysis	NPC Chapter 4: Energy infrastructure	NPC Chapter 5: Low carbon
<p>Economics and finance:</p> <ul style="list-style-type: none"> beyond GDP; full-cost accounting based choices Transformational Think beyond our current growth paradigm 	<p>‘... sustainable supply of domestic coal needs for power, synthetic fuels and chemicals, and sustainable expansion of coal export markets...’</p>	<p>Commitment to carbon constraints</p> <p>The low carbon economy appears to be conditional, in that it is proposed to roll out without harming jobs or competitiveness</p> <p>How to make use of minerals... whether there is any role for them in long term</p>
<p>Relationship to nature and society:</p> <ul style="list-style-type: none"> Precautionary; planet, people and prosperity; intergenerational focus Building resilience to climate change Preservation of our resource base (water is paramount) 	<p>Trade-offs between environmental and energy options – not an acknowledgement of ecological limits</p> <p>Reliance on cleaner coal technologies and shale gas to mitigate climate change</p>	<p>Internalize externalities through full-cost accounting</p> <p>Acknowledge that human well-being is dependent on the well-being of the planet</p> <p>Need for coherent plan to use water sustainably</p>
<p>Public transport not based on fossil fuels</p>	<p>Increase liquid fuels refining capacity</p> <p>Commuter rail upgrade</p>	<p>Emissions-related penalties for motor vehicles</p> <p>Support for public transport</p>

In the NDP engagement with civil society on chapter 5, ‘The low carbon economy’, the tensions between different policies were articulated by stakeholders.

‘... Chapter four on economic infrastructure and chapter five on a low carbon transition are contradictory and do not speak to each other sufficiently. This should be addressed. Assumptions about energy costs for future supply need to be interrogated and clarified. The low carbon chapter had stakeholder engagement but the chapter dealing with energy did not. Some of the principles and assumptions that were agreed on for a low carbon transition at a stakeholder workshop did not appear in the low carbon chapter. Perhaps some of the terms of reference for the commissioners were inherently contradictory of the stated aims of the objective of the plan...(SEA 2012).’

Appendix B: An overview of key climate change related policies as identified in the NCCRWP and implemented by the Department of Energy – the results of the BRRR assessment as presented to parliament (DPME 2012)

Key implementing department	Low carbon policy	State of implementation	Progress as assessed by DPME
Department of Energy	<p>Policy:</p> <ul style="list-style-type: none"> • Shift to low carbon electricity generation (p28) • Target 10,000GWh by 2014 	28 bidders of RE projects reach financial closure in November 2012	There is a need to clear obstacles to enable renewable energy implementation; Measurement of current use of renewable energy must be reported to track progress
Department of Energy	<p>NCCRS:</p> <ul style="list-style-type: none"> • Increase in energy efficiency • 12 percent by 2015 	<p>Verified SWH installations were 289,201 by March 2012 with a target of 1 million SWHs by 2013¹⁶</p> <p>Demand savings of 9TWh by 2012/13.</p>	Target not likely to be reached.
Department of Energy	<p>NCCRS:</p> <ul style="list-style-type: none"> • Increase in energy efficiency (p28) • 12 percent by 2015 	<p>NEEA institutional arrangements in place;</p> <p>Energy efficiency incentives under income tax in place</p> <p>1.4TWh of savings verified for last year out of total of 220TWh annual consumption</p>	While progress is noted, reporting is required on the extent of actual reductions in relation to the target percentage
Department of Energy Department of Transport	Promote modal transport shift and switch to alternative vehicles	The target for moving coal from road to rail is 19 million tons by end of 2012/2013 which is 'unlikely to be achieved'(DPME 2012)	'unlikely to be achieved'

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NOTES

- 1 Northern Cape (29.7 percent) and Mpumalanga (26.1 percent)
<http://www.statssa.gov.za/Publications/P0318/P0318April2012.pdf> (p40).(General Household Survey 2011)
- 2 The best-known measure of inequality, in which 0 is the most equal and 1 the least.
- 3 The South African Guidelines for Healthy Eating suggest up to 300 grams of starchy foods per day, 5 portions of fruit and vegetables and 75–100 grams of meat three times per week per person
ftp://ftp.fao.org/es/esn/nutrition/dietary_guidelines/zaf_eating.pdf
- 4 One way of indicating affordability is the proportion of income spent on energy as a proportion of total household income. In countries like the UK (where expensive winter space heating is required) poor households spend 10 percent of their income on energy purchases, while in South Africa poor households spend up to 20 percent (Winkler et al 2006). In Brazil, high increases in tariffs made electricity use unaffordable for the poor despite a very high electrification rate (96 percent electrified by 2001).
- 5 These are average prices and differ from local authority to local authority. Prices in bold actually applied.
- 6 In this trajectory, emissions would peak between 2020 and 2025 with a lower range of 398 MtCo2e and an upper range from 583 MtCO2e to 614MtCO2e. The plateau would remain at a maximum of 614MtCO2e and decline after 2036 to a lower range of 212MtCO2e and an upper limit of 428MtCO2e by 2050 (DEA 2011).
- 7 This is not the total amount of RE under REIPPP windows 1& 2 as the 2012 BRRR ended March 2012 and subsequent allocations will only be reported on in the 2013 BRRR.
- 8 In 2007, the Department of Mineral and Energy affairs was split into two separate departments – with as separate Department of Energy.
- 9 The REIPPP was colloquially known as REBID for short
- 10 The four institutions provided separate presentations that highlighted different aspects of the delivery challenge from their different perspectives.
- 11 Workshop with authors at University of Cape Town (UCT), 1 March 2013.
- 12 *Ibid.*
- 13 *Ibid.* For example, in China, industrial policy has been successfully used to promote the expansion of production of wind turbines initially for the export market, and subsequently for domestic use.
- 14 See for example President Zuma’s speech at the launch of the South African Renewables Initiative, 2011: ‘Renewable energy still costs more than non-renewable energy, which in South Africa is largely supplied by cheap, abundant coal supplies.’ <http://sarenewablesinitiative.wordpress.com/>
- 15 In their critique of the NWRS, civil society highlights the commoditisation of water, where customers who can pay are allowed to use as much as they want while those who can’t pay are restricted to a minimum. As with electricity, water users in some areas have to pay fixed daily charges irrespective of how much water they use. A typical bill for a low income house could be R859, the majority of which is fixed charges. This leads to increased stress for householders who cut back their water use to an absolute minimum and yet are still in debt (South African water caucus 2013).
- 16 This SWH target is also the responsibility of DPE as Eskom is the delivery agent as well as treasury.

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