

Second Class Citizens: Gender, energy and climate change in South Africa



Earthlife Africa Johannesburg
Written by Jocelyn Newmarch
March 2011

The Sustainable Energy and Climate change Project seek a just transition to renewable energy and a low carbon economy. The SECCP works to promote local and global environmental and social justice on sustainable energy and climate change issues, by changing policies and behaviour through building the awareness and capacity of civil society and government, to achieve an equitable future with respect for all. The SECCP is a campaign within Earthlife Africa Jhb.

Contact details for the SECCP are:

Sustainable Energy & Climate Change Project

Tel: +27 11 339 3662

Fax: +27 11 339 3270

Email: seccp@earthlife.org.za

P O Box 32131

Braamfontain 2107

South Africa

www.earthlife.org.za

ACKNOWLEDGEMENTS

PHOTOGRAPHS COURTESY OF:

Front Cover: Abahlali baseMjondolo Movement S.A

Pg 8: Design By Nature

Pg 14: Design By Nature

Pg 18: Design By Nature

Pg 26: Groundwork, Friends of the Earth S.A

Pg 38: Groundwork, Friends of the Earth S.A

Pg 41 and 42: Design By Nature

This research report was made possible through the kind support of Oxfam Novib and UNDP. The views expressed in this report are not necessarily those of Oxfam Novib or UNDP.

TABLE OF CONTENTS

	EXECUTIVE SUMMARY.....	3
1.	INTRODUCTION.....	6
2.	POVERTY, ENERGY AND GENDER.....	9
	2.1 The female face of poverty.....	9
	2.2 Inferior fuels for inferior people?.....	11
	2.2.1 Paraffin and coal.....	12
	2.2.2 Drudgery and energy poverty.....	13
	2.3 Keeping the lights on is women's work.....	16
	2.4 Gender-inclusive policy and the law.....	17
3.	ENERGY POLICY IN SOUTH AFRICA.....	19
	3.1 Muddling through.....	19
	3.2 Moral hazard and the risk of over-investment.....	21
	3.3 A new vision: The White Paper on Energy, 1998.....	23
	3.4 A false dawn: The White Paper on Renewable Energy, 2003.....	28
	3.5 Climate change and society.....	33
	3.6 South Africa's climate change policy.....	34
	3.7 The Long-Term Mitigation Scenarios.....	35
	3.8 The Integrated Resource Plan 2010.....	36
	3.9 National Climate Change Response Green Paper.....	40
4.	LIST OF RECOMMENDATIONS.....	42
5.	RECOMMENDATIONS AND CONCLUSIONS.....	43
	5.1 Biogas.....	44
	5.2 Better homes cost less.....	45
	5.3 Conclusion.....	46
6.	BIBLIOGRAPHY.....	47

EXECUTIVE SUMMARY

Access to energy is central to reducing poverty and hunger, improving health, increasing literacy, supporting small business development and income generation and improving the lives of women and children. If ordinary women find it difficult to gain access to energy, they are likely to be poorer with greater drudgery in the home. In turn, this impacts the entire country, as these women are less economically active with less time to earn an income, and fewer ways to spend the money they do have.

Forty percent of South Africa's 48 million people are poor,² and more than half of poor people are female. Official unemployment figures hover at around 25%,³ but since this statistics does not count those who have given up looking for work, real unemployment may be double this.

South Africa is, by world standards, relatively rich. We are classified as an upper-middle income country with a gross domestic product of R667 billion and can produce up to 38 000 megawatts (MW) of electricity.⁴ However, these benefits accrue mainly to mining houses, large industry, and upper and middle class consumers.

Meanwhile, as the world's 12th largest emitter of greenhouse gases, our development path means we are a disproportionate contributor to climate change.⁵ Poor South Africans see little of the economic benefits, but are most vulnerable to the impacts climate change will bring.

According to a study conducted by lobby group Citizens United for Renewable Energies and Sustainability, approximately 2.5 million households still have no access to electricity, while 4 million households do not use electricity for cooking.⁶ This could mean that 20 million people still rely on dirty, polluting fuels, if an average household size of five people is assumed.

Clearly, simply increasing electricity capacity will not be enough to solve South Africa's problems of poverty and unemployment. Neither will increasing access to electricity without examining affordability. Yet these two priorities, in large part, have been the focus of energy policy in recent years.

South Africa has a legal duty not only to consider women's needs and desires when making policy, but to actively ensure its policy is gender-inclusive. This means that policy must seek to enhance the status of women and eradicate gender inequality.

This duty arises from an imperative given by the Constitution, the highest law in the land, which states that:

“The state may not unfairly discriminate directly or indirectly against anyone on one or more grounds including race, gender, sex, pregnancy, marital status, ethnic or social origin, colour, sexual orientation, age, disability, religion, conscience, belief, culture, language and birth.”⁷

² Department of Environmental Affairs 2010.

³ Department of Environmental Affairs 2010.

⁴ Department of Environmental Affairs 2010.

⁵ The Guardian, 31 January 2011.

⁶ SABC News, 4 March 2009.

⁷ The Constitution of the Republic of South Africa. Section 9.3.

To promote equality, which includes “*the full and equal enjoyment of all rights and freedoms*”, legislative and other measures designed to protect or advance persons disadvantaged by unfair discrimination may be taken.⁸ Policy may not unfairly discriminate, even indirectly, against people on the basis of gender. Policy may also promote equality between groups of people.

The reality is that South African policy makers have not found it easy to mainstream gender concerns within energy policy. Policy makers and pressure groups are accustomed to considering energy in terms of megawatts and macro-economics – rather than in terms of the impact on ordinary people. We have given too much space to experts and elites, and not enough to consumers who do not use technocratic jargon. Social justice considerations have been sidelined.

Energy policy which is presented in a jargon-heavy way makes it difficult for citizens to engage in the policy process. The Integrated Resource Plan 2010 (IRP 2010), an attempt to forecast South Africa's energy needs for the next 20 years, is probably the most extreme example of this trend. While in theory everyone can participate in public consultation workshops, in practice workshops which are held only in a few major centres or at awkward dates become exclusionary. In addition, public consultations are often not publicised appropriately.

Women themselves have only engaged in energy policy to a limited extent. There are relatively few female professionals in this industry, and, despite a few key female leaders, decision-making processes are still male dominated. Many civil society organisations have, likewise, engaged with policy makers in terms of the broad, overarching technical issues that energy policy is concerned with, rather than on the human scale.

In order to begin to understand what it means to include gender as a reference point for energy, we have to re-examine our own thinking on energy. For this reason, this paper first examines the existing ways that energy and gender are connected in South Africa, before analysing the policy landscape for energy.

In many households, energy is a woman's responsibility. She needs energy to cook and heat water, and she is responsible for fetching wood or buying prepaid electricity. The price of energy, and the ease of access, is directly relevant to her life. Gender-blind policy risks leaving an important group of consumers behind.

Official policy blindness is not inevitable. The 1998 White Paper on Energy, which represented the first attempt to tackle energy policy by a democratic government in South Africa, explicitly recognised that women are important consumers of energy who, up until now, have been overlooked.

This initial commitment to a gender-mainstreaming of energy policy has been progressively watered down in succeeding energy policy documents. One way in which government has sought to tackle women's energy poverty has been to increase access to grid electricity in South Africa. Yet this has not proved a panacea, since the poorest households simply cannot afford electricity for cooking and heating – their major energy needs.

⁸ Ibid

It is easy to criticise, but solutions can be harder to find. So we offer the following:

- greater participation of women in drawing up energy policy;
- greater representation of women in energy decision-making positions;
- focus on people's needs;
- better housing;
- broader access to electricity;
- renewable energy such as biogas digestors, particularly for off-grid consumers; and
- subsidies or finance to ensure these measures are affordable.

A gendered energy policy would consider the likely effect of its recommendations on residential consumers, and how these effects may be improved. This could be achieved through the implementation of a strategy to create a greater numbers of jobs – such as renewable energy manufacturing – or perhaps through strategies which would save women money, such as energy efficiency in the home.

South Africa's energy policy is failing millions of women. It is critical that their needs are communicated to policy makers and that when new policy is drawn up, it is gender sensitive.

1. INTRODUCTION

Access to energy is central to reducing poverty and hunger, improving health, increasing literacy, supporting small business development and income generation and improving the lives of women and children. The Department of Energy is mandated to provide universal basic access to energy.

Yet in Africa's largest economy, and largest polluter, poverty remains widespread and 4 million households do not use electricity for cooking, according to a study by Citizens United for Renewable Energies and Sustainability.⁹ In the region of 2.5 million households do not have access to electricity, and even where households do have access to electricity, they often cannot afford to use more than their allowance of free basic electricity.¹⁰

Dependence on dirty, polluting fuels remains widespread. The ill health effects of indoor air pollution are estimated at approximately R800 million a year,¹¹ with 1 000 deaths every year.¹²

Most of this burden falls on women. Women are more likely to be poor and unemployed. When they work, they earn less than men.¹³ And frequently they are in charge of household energy, because cooking is a woman's duty in many homes. This gendered aspect of energy policy has too often been inadequately addressed by South African policy makers.

South Africa is classified as an upper-middle income country with a gross domestic product of R667 billion and has 38 000 MW of installed capacity. Approximately 40% of its 48 million population is classified as poor and official unemployment figures are in the region of 25%.¹⁴ While we are one of the world's top 20 emitters of greenhouse gases, with coal providing 85% of electricity needs, these emissions have not brought us wealth.¹⁵

Locally, concerns about greenhouse gas emissions appear to have been tempered by the urgency of formulating policy which creates jobs and promotes industrial growth. Energy security, at cheap prices for industry and mines, is seen as a key part of overall economic policy for the country.

Increasing electricity capacity will not be enough to solve our problems of poverty and unemployment, and neither will increasing access to electricity without examining affordability. But recent energy policy has focused on these two priorities enhance the status of women and eradicate gender inequality.

⁹ SABC News 4 March 2009.

¹⁰ SABC News 4 March 2009.

¹¹ Department of Minerals and Energy 2003.

¹² Barnes 2009.

¹³ Reddy 2008 and Abrahams 2009.

¹⁴ Figures taken from Department of Environmental Affairs 2010.

¹⁵ Figures in this paragraph taken from Department of Environmental Affairs 2010.

The Intergovernmental Panel on Climate Change (IPCC) has consistently found that climate change is most likely a result of the greenhouse gases emitted as a result of human activity. Those who are likely to experience the worst effects of climate change are poor people, according to the IPCC.¹⁶ They often rely on subsistence farming and fishing for their livelihoods and are directly impacted by changes in weather systems, such as droughts, flooding and related changes in crop fertility. They also have the least capacity to adapt to climate change.

In South Africa, those communities most vulnerable to climate change are likely to include the poor, women, rural people and those living with HIV/Aids, according to Oxfam International and Earthlife Africa.¹⁷

Climate change, in South Africa, has emphasised mitigation – reducing growth in greenhouse gas emissions – rather than adaptation. While the National Climate Change Response Green Paper inches forward on mitigation, research into possible adaptation strategies remains scarce. There has been little discussion on how poor people and women¹⁸ can reduce their vulnerability to climate change.

A concern with large-scale provision of power to industry and urban centres has not allowed policy makers the space to consider the social dimensions of energy. Alternative policy options, such as renewable energy and private sector generation, have recently received political and media attention. Yet the description of a pro-poor, gender-sensitive and environmentally responsible energy path has not been attempted by policy makers.

In addition, the type of language used influences how society talks about climate change and is used as a powerful strategy of exclusion. The current framework fundamentally undermines a feminist and pro-poor approach by giving authority to engineering, scientific and economic models that emphasise growth as a panacea. Experts, rather than the concerns of ordinary people, appear to be driving the debate, which is framed in language difficult for the ordinary person to understand.

This report will offer a gendered perspective of current energy and climate change policy in South Africa. Energy and climate change has been addressed as a technical, scientific and economic issue. In doing so, we are in danger of losing sight of the social impact – the human face – of energy and climate change.

This paper aims to answer the following questions:

- Why do we need energy policy which promotes gender mainstreaming?
- What does a gender-inclusive energy policy look like?
- How can this type of policy be drawn up?

South Africa's energy policy is failing millions of women. It is critical that their needs are communicated to policy makers and that when new policy is drawn up, it is gender sensitive.

¹⁶ Environment News Service, UN Climate Change Impact Report: Poor Will Suffer Most, 6 April 2007.

¹⁷ Oxfam International and Earthlife Africa Johannesburg 2009.

¹⁸ Poor people tend to be more vulnerable to climate change, both because they often live off the land and because they have limited means of coping with change. Women are more likely to be poor and may have fewer rights than men – for example, land tenure.

TAKING GENDER INTO ACCOUNT

Men and women may use electricity in different ways, as the following study from Ghana illustrates.¹⁹

Men preferred connection points in the front of the house, for entertaining friends, for music, and for TV. Women surveyed preferred lighting in the kitchen, for preparing food, the work room, for income-generating activities, and at the back of the house by the bathroom, in order to wash children.²⁰

The Ghanaian women wanted electricity to make their domestic and income-generating work easier and more productive. They need light where they work. Their income-generating work often takes place inside the home, while doing other domestic chores or taking care of children.

Men, on the other hand, may work outside the home, or prefer higher wattages of electricity in order to operate tools. They may also put a high priority on children's education. Considering gender preferences may enable better developmental outcomes from existing policies.



¹⁹ Biogas village power project, Ghanaian Ministry of Mines and Energy, cited by Cecelski 1998.

²⁰ Cecelski 1998: 3.

2. POVERTY, ENERGY AND GENDER

Being without wood for two days during the rain meant being without cooking, which in turn, means being without food. There is no bread in these households, no fast foods or cookies or anything other than salt and mealie meal and tea leaves and sugar. - Annecke, 1998²¹

2.1 The female face of poverty

In South Africa, the face of poverty is often female, and often has inadequate access to energy.

The UN Development Programme found that 54.4% of poor people in South Africa are women - the equivalent of 11.9 million people. Sixty percent of female-headed households are poor compared to 31% of male-headed households. Around twice as many children in female-headed households went hungry compared to children in male-headed households.²²

Some reasons for this discrepancy are that female-headed households are more likely to be based in rural areas, where poverty rates are higher and opportunities are lower, and they may also have fewer working adults.²³

Women are harder hit by wage disparities and unemployment. In 2007, 30.8% of women were defined as unemployed, compared to 27.2% of men. (This definition in fact underestimates the number of people without work, as it includes only those who are actively searching for work, rather than those who are disheartened by the lack of available jobs. In 2005, women earned 45 cents for every rand earned by men.²⁴

Seventy five percent of female applicants for debt counselling are single parents²⁵ and less than 35% received any maintenance payments from their former partners, with less than 10% receiving regular payments. This indicates the disproportionate economic burden on women.

Poverty has many aspects, and one of these is energy. Energy is needed for food preparation, space heating or cooling, to produce light, to charge cell phones, and to listen to the radio, to name only a few functions. Electricity, if available, may be too expensive to cook with. Thus, even once electric lighting is available, households may continue to use coal, wood or paraffin stoves. These have the additional advantage of space heating.

²¹ Quoted in Balmer 2007:4.

²² Reddy 2008.

²³ Reddy 2008.0.

²⁴ Abrahams 2009.

²⁵ Fisher-French 2010.

According to Reddy, it is the need for thermal energy in particular which continues to entrap households in poverty. *“Studies have indicated that despite the introduction of electricity to poor households, the use of inferior fuels does not cease, but merely shifts in application, due to the burden of poverty.”*²⁶

Energy poverty in South Africa endures despite a massive electrification drive, which connected 2.5 million households to the national grid between 1994 and 1999. The percentage of households with access to electricity now stands at over 80%, from only 36% in 1994,²⁷ but most poor households still switch between multiple fuels and rarely use electricity for cooking or space heating.

Despite the general upward trend, in the Western Cape and Limpopo, electricity connections have actually decreased since 2007.²⁸ Just over 13% of households reported they had had their electricity cut due to non-payment in the 30 days preceding an official survey.²⁹

A free basic electricity policy was implemented in 2003 in response to this affordability problem. An amount of 50kWh is provided free to poor households. This is thought to be enough electricity to meet the minimum needs of poor households, such as basic lighting, basic cooking, basic ironing, TV and radio.³⁰

A review of this policy by Earthlife Africa Johannesburg found that this amount is insufficient for the needs of poor households. A light bulb used for four hours a day for a month will consume 20kWh, an electric stove used for one hour a day uses 42kWh, and boiling a kettle for 30 minutes a day for a month uses 21kWh, according to Earthlife's analysis.

In addition, the policy is being implemented unevenly. In some areas, households are able to receive their free amount if they are registered as indigent, while Ekurhuleni municipality provides 100kWh free to all customers. In some municipalities there are no structures to roll out this policy, while in others, consumers must change to prepaid electricity meters (which have a higher cost tariff) and a limited current.³¹

While many households cannot afford to use electricity at all, others pay almost double the official price for unsafe illegal connections. According to the Commission for Gender Equality, there is evidence that *“... women who obtain electricity outside the legal network, such as those living in backyard shacks, tend to pay almost double for electricity than those connected to the formal network. This is because they are paying a middleman, who adds a mark-up to the price received by Eskom”*.³² While it is illegal to resell electricity – for good reason – it is equally clear that people are desperate to obtain it.

Poor people not only have worse access to energy, but they also spend proportionally more of their income on fuel. The average poor household in South Africa spends 25% of its income on energy, compared to 2% for more affluent homes.³³

Even when electricity is available, households may not be able to afford the appliances necessary to use it.

²⁶ Reddy, 2008: 8.

²⁷ National Electrification Programme (NEP) 1994-1999: Summary Evaluation Report.

²⁸ Statistics SA 2010.

²⁹ Statistics SA 2010.

³⁰ Earthlife Africa 2010: 14.

³¹ Earthlife Africa 2010: 18.

³² Commission for Gender Equality 2009: 5, citing Abrahams 1999.

³³ According to Sugrue 2005 cited in Balmer 2007.

2.2 Inferior Fuels for Inferior People?

Even those households with access to electricity frequently use several different fuel sources to meet their needs.³⁴ A study conducted in rural North West Province found that approximately 44% of households had never used electricity for cooking, three years after being electrified, while 89% had never used electricity for heating.³⁵

A 2003 study in Cato Manor, Durban, found that 87% of households relied on paraffin for cooking, while a 2001 study in Alexandra, Johannesburg, found that 52% of households used paraffin to cook.³⁶ Households also continued to use paraffin even after they had access to electricity, with 90% of households in Lady Grey (Eastern Cape), 73% in Benoni (Gauteng), 73% in Gugulethu (Western Cape) and 56% in Galashewe (Northern Cape) doing so.³⁷

Paraffin produces carbon monoxide and other pollutants when burned and is highly inflammable.³⁸

Official statistics show that in 2009, approximately a quarter of households still relied on paraffin or wood for cooking, compared to 36% in 2002.³⁹

The following percentages of households in the provinces of South Africa rely on paraffin and wood as an energy source:

- Limpopo - 54.4%;
- Eastern Cape - 40.8%;
- Mpumalanga - 29.2%
- KwaZulu-Natal - 28.4%;
- North West - 28.2%
- Gauteng - 11.6%;
- Free State - 15.5%
- Northern Cape - 15.7%; and
- Western Cape - 6.5%.⁴⁰

These numbers correlate with the distribution of poverty in South Africa.

³⁴ Barnes et al 2009.

³⁵ Matthee et al 2000. Cited in Barnes et al, op cit.

³⁶ Muller et al 2003 and De Wet et al 2001, cited in Barnes et al 2009.

³⁷ Roberts & Wentzel 2006, cited in Barnes et al 2009.

³⁸ Kruger 2005 in Reddy 2008.

³⁹ The exact figures are: 24,8% of households in 2009 and 35,8% of households in 2002. Statistics South Africa 2010.

⁴⁰ Statistics South Africa 2010.

Health guidelines for carbon monoxide, sulphur dioxide and nitrogen dioxide levels are frequently exceeded when dirty fuels, such as paraffin and biomass are burnt. While the World Health Organisation estimates that 1 000 people die every year as a result of indoor air pollution in South Africa – 450 of them children – the South African Medical Research Council suggests the number may be substantially higher, with 2 489 deaths annually, of whom 1 400 would be children.⁴¹

Valuation estimates for the annual mortality and morbidity burden of household coal pollution range from R202 million to R813 million for 2001.⁴² Women are more at risk from indoor pollution effects, because of their cooking duties.

In many households, the provision of energy is a female task. Where clean and affordable energy is not available, poor women substitute biomass and their own physical labour.

This is a considerable burden. In rural areas, women spend several hours each day to fetch wood and water for cooking and heating. Fuel wood loads may weigh up to 35kg, with up to four trips undertaken per week.⁴³ In a study in Limpopo, 69% of respondents reported spinal pain as a result of carrying water. The mean weight of water carried was 19.5kg – indicating that several loads were in excess of this amount.⁴⁴ This may lead to head, neck and back pain, and even childbearing complications.

These tasks are onerous, but they may also involve physical danger. Women, and the children who assist them, risk falls, injury from snake bite or other animals, and even assault or rape.⁴⁵ Environmental degradation caused by climate change often increases the time spent providing household energy.⁴⁶

2.2.1 Paraffin and Coal

Paraffin remains a popular fuel choice for South Africans, despite its dangers. Paraffin “... *remains the most affordable, convenient and practical energy source for many poor South African households, rural and urban alike ...*” according to Yachika Reddy.⁴⁷

Paraffin⁴⁸ is a toxic fuel and its use in poorly ventilated homes increases the risk of inhalation and thus contracting or exacerbating respiratory illness. Paraffin is often stored in empty cool drink bottles and the risk of accidental ingestion is high.

Fires resulting from the use of paraffin stoves are frequent, with over 400 000 fires annually. (Candles, used for lighting, are another fire hazard). Approximately 100 000 homes are destroyed every year, particularly in high density informal settlements. Fires also result in fatalities and burns, with the latter being the leading cause of death among young children.⁴⁹

⁴¹ Barnes et al, op cit.

⁴² Department of Minerals and Energy 2003: White Paper Renewable Energy.

⁴³ Annecke 2010 in Reddy 2008.

⁴⁴ Geere et al 2010.

⁴⁵ Former deputy president and minister of minerals and energy Phumzile Mlambo-Ngcuka indicated that there is research showing that a number of women had been raped while performing these chores. Cited by Tinto and Banda 2005.

⁴⁶ Babugura and Mtshali, 2010.

⁴⁷ Reddy 2008: 10.

⁴⁸ This discussion of paraffin is taken from Reddy, 2008: 10-11.

⁴⁹ Kruger, 2005, cited in Reddy, 2008.

The 2003 Treasury Report estimated that the externality cost of paraffin related incidents to be R104 billion in South Africa, which is 50 times more than the annual turnover from paraffin sales.⁵⁰

Although coal is not popular at a national level for household cooking and heating (3% and 7% respectively in 2001) the problem is highly localised. Over 63% of households in informal settlements in the Vaal Triangle area of Sasolburg, Vereeniging and Vanderbijlpark are reliant on coal.⁵¹

2.2.2 Drudgery and Energy Poverty

Women expend their own physical energy to collect biomass such as wood and animal dung to use as fuel. This is needed for space heating and preparing food – traditionally female responsibilities. These fuels must be hoarded and used carefully in order to spare women unnecessary physical labour. Women are intimately involved with managing and conserving energy resources as a survival strategy.⁵²

Much of this work is invisible in official statistics. Women's survival tasks, based on their own metabolic energy inputs, are invisible in energy statistics, while their contributions in the informal sector are excluded from economic statistics.⁵³

According to Abrahams, a study conducted in 2000 found men spent an average of 87 minutes a day on productive activities excluded from GDP calculations, while women spent 247 minutes a day on this type of activity – about four hours. These activities could include household chores, caring for children, cooking and fetching fuel. The same study suggested the value of unpaid labour could be calculated at between 32% and 38% of GDP, depending on the method used. About three quarters of this labour is provided by women.⁵⁴

Biomass fuels carry a high price. When burned on rudimentary devices, they can release high concentrations of toxic pollutants, such as particulate matter, carbon monoxide, oxides of nitrogen, sulphur dioxide and volatile organic compounds.⁵⁵

Exposure to these fuels is associated with a number of respiratory diseases including chronic obstructive pulmonary disease, lung cancer, nasopharyngeal cancer, tuberculosis and eye disease. Low birth weight and acute lower respiratory infections may be recorded, particularly in children under the age of five.⁵⁶

According to government figures, up to 40% of households in South Africa – mostly low income households in rural and urban informal settlements – still rely on inferior and expensive fuels.⁵⁷ This means that nearly 5 million households, comprising 20 million people, use paraffin, biomass or coal for heating and cooking.⁵⁸ Coal is used in particular by Highveld households.

⁵⁰ Reddy 2008.

⁵¹ Barnes et al 2009.

⁵² Rukato 2001: 6.

⁵³ Clancy 1999, citing Cecelski 1999.5

⁵⁴ Budlender and Brathaug cited in Abrahams 2009.

⁵⁵ Barnes et al 2009.

⁵⁶ Barnes et al 2009.

⁵⁷ Department of Minerals and Energy 2007, cited in Reddy, 2008.0.

⁵⁸ Reddy, 2008. I have rounded up her figures for ease of reading. She lists 4.85 million households and 19.85 million people.

In recognition of this burden, development practitioners speak about energy poverty. Researcher Yachika Reddy defines energy poverty as:

“... the lack of choice in accessing adequate, reliable, good quality, safe, and environmentally benign energy services to sustain economic and human development. Another aspect of energy poverty throughout the developing world (including South Africa), where the poor are forced to rely on biomass for energy sources, are the inefficient ways of producing and using these energy sources which result in adverse health and environmental impacts.”⁵⁹

In this definition, it is the qualities of energy fuels and their impact that indicate poverty, rather than the source of energy. The absence of electricity is not a prerequisite for energy poverty. Neither is the provision of electricity an indication that a household is not energy poor. This is particularly pertinent in South Africa, where, despite high rates of access to electricity, even electrified households may still rely on dangerous cooking fuels such as paraffin, or polluting ones such as biomass.⁶⁰

There is growing awareness of the importance of energy to poverty alleviation. The UN Development Programme recognises that provision of adequate and affordable energy is integral to poverty alleviation, improved human welfare and increased living standards.⁶¹ South African law already recognises that energy is a basic need.⁶²

Although energy is not mentioned in the eight Millennium Development Goals designed to eradicate extreme poverty by 2015, according to the OECD and IEA, it is difficult to see how these goals could be achieved without improving access to energy.⁶³ (See box on Energy and the Millennium Development Goals.)



⁵⁹ Reddy 2008:8. She cites the Government of South Africa 2006-7, Banks 2003, UNDP 2000, Thom 2000.,

⁶⁰ Biomass in urban areas can include materials such as paint covered timber, chipboard, and so on.,

⁶¹ UNDP 2000, cited in Reddy 2008:7,

⁶² Department of Minerals and Energy, White Paper on Energy, 1998.,

⁶³ Organisation for Economic Co-operation and Development and International Energy Agency, 2010,

Energy and the Millennium Development Goals

Goal 1: Eradicate extreme poverty and hunger. Access to modern energy facilitates economic development by providing more efficient and healthier means to undertake basic household tasks and means to undertake productive activities more generally. This is often cheaper than using inefficient substitutes, such as candles rather than batteries. Modern energy can power water pumping, providing drinking water and increasing crop yields.

Goal 2: Achieve universal primary education. In impoverished communities, children, particularly girls, commonly spend time on chores such as gathering fuel wood, fetching water and cooking. Access to improved cooking fuels and technology facilitates school attendance. Electricity is important for education because it facilitates communication – such as radio and television – and also provides basic needs such as lighting.

Goal 3: Promote gender equality and empower women. Improved access to electricity and modern fuels reduces the physical burden associated with carrying wood and frees up valuable time for women, widening their opportunities for income generation. In addition, street lighting improves the safety of women and girls at night, allowing them to attend night schools and participate in community activities.

Goals 4, 5, and 6: Reduce child mortality; Improve maternal health; and Combat HIV/AIDS, malaria and other diseases. Most staple foods require cooking. Improved cooking fuels and stoves improves indoor air quality. This decreases the risk of respiratory infections, chronic obstructive lung diseases and lung cancer (when coal is used). Improved access to energy allows households to boil water, thus reducing the incidence of water-borne diseases. Improved access advances communication and transport services, which are critical for emergency health care. Electricity and modern energy services support the functioning of health clinics and hospitals.

Goal 7: Ensure environmental sustainability. Modern cooking fuels and more efficient cookstoves can relieve pressure on environmental resources. Fuel wood is a major contributor to desertification, soil erosion and deforestation. Low-carbon renewable energy protects the environment locally and globally. Using cleaner energy reduces greenhouse gas emissions and global warming.

Goal 8: Develop a global partnership for development. Electricity is necessary to power information and communication technology.

Source: OECD / IEA Energy Poverty – How to make modern energy access universal?
September 2010.

2.3 Keeping the Lights on is Women's Work

Research suggests that women are energy managers in urban as well as rural settings.

Annecké (2005) documents the following finding from a survey of 250 homes in Khayelitsha, Cape Town:

“Women manage electricity much as they managed wood: they supply the money, they walk to buy credits (for the pre-payment meters) and they are heaviest users of electricity – albeit mostly for family rather than personal activities, such as cooking or ironing. In most households, men assist in some way or other, and there was evidence that men recognise the difference between using the most electricity and benefiting the most. Having electricity meant better education, television, health and safety as well as more leisure time for both men and women.”⁶⁴

According to Balmer (2007), there is evidence that certain fuels are seen as masculine or feminine and that expenditure on energy differs according to gender. Men spend more money on batteries⁶⁵ and households with high battery expenditure have men and sons who listen to taped music.⁶⁶ He quotes Makan (1996) saying that “... men tend to buy larger, costlier appliances, whereas women control money for smaller routine items. What the spouses buy, reflect power and money over resources ...”⁶⁷

Annecké (1992) found that paraffin was regarded as a “feminine” fuel as it symbolised and encouraged trends and relationships among women in the community. Hoets (1995) records statements from women such as “My coal stove is my life, without it my life would be meaningless because I won't be able to make a warm house, cook, heat water for my children or iron for them.”⁶⁸

Further, Balmer asserts that batteries are viewed as a “man's energy” with women seldom identifying themselves with battery purchases, while paraffin is regarded as a women's fuel because “female-related work” is associated with paraffin use.⁶⁹

Other researchers have found that household tasks can be strictly segregated in male-headed households. Hooper-Box et al⁷⁰ found that women are generally responsible for the management of the household and children, but men control finances and make and enforce decisions. Poor urban women lack decision-making and purchasing powers for energy, according to Rukato.

“Men's and women's differential rights and needs are particularly evident when one examines the amount spent on batteries in households... recreational appliances, such as television and radios, were bought before appliances which may aid women in their domestic work. The decision to purchase appliances and their ownership lay in the hands of the men of the household.”⁷¹

⁶⁴ Annecke 2005. Quoted by Commission for Gender Equality 2009.

⁶⁵ Balmer 2007, citing Hooper-Box et al 1997.

⁶⁶ Balmer 2007, citing Annecke 1994 and James 1993.

⁶⁷ Makan 1996 quoted in Balmer 2007.

⁶⁸ Annecke 1992 in Balmer 2007:5 and Hoets 1995 cited in Van Niekerk 2006:60.

⁶⁹ Balmer 2007, citing Hooper-Box et al 1997.

⁷⁰ Reddy, Cited by Balmer 2007 and also Rukato 2001.

⁷¹ Hooper-Box et al 1998: 2. Quoted in Rukato 2001: 8.

2.4 Gender-inclusive Policy and the Law

According to the Constitution, the highest law of the land, as well as international law, South Africa has a duty to consider women when making policy. Policy must be gender-inclusive, ie that not only must it take account of women's needs, but it must also seek to enhance the status of women and eradicate gender inequality.

This means that gender-inclusive policy is not merely a nice-to-have. It is the kind of policy South Africa has to make according to its own supreme law. The Constitution says:

“The state may not unfairly discriminate directly or indirectly against anyone on one or more grounds including race, gender, sex, pregnancy, marital status, ethnic or social origin, colour, sexual orientation, age, disability, religion, conscience, belief, culture, language and birth.”⁷²

In addition, to promote equality, which includes *“the full and equal enjoyment of all rights and freedoms”*, legislative and other measures designed to protect or advance persons disadvantaged by unfair discrimination may be taken.⁷³

Women may not suffer unfair discrimination, even indirectly, from policy. Policy may also promote equality between groups of people, and may promote groups who have suffered unfair discrimination in the past.

South Africa is signatory to international conventions that advance the status of women, including the Beijing Platform for Action and the Durban Declaration by African Energy Ministers. Where international and national law conflict, international law must take precedence.⁷⁴ South Africa's support for international policies which support gender mainstreaming mean that it has a legal obligation to consider the rights of women when making domestic policy.⁷⁵

These international agreements⁷⁶ include the Convention on the Elimination of all forms of Discrimination against Women (CEDAW) which obliges the state to guarantee women the right to enjoy adequate living conditions, including housing, sanitation, electricity and water supply. The Beijing Declaration and Platform for Action guarantees the right to socio-economic development that does not harm the environment and the full and equal participation of women as agents and beneficiaries of economic development. The UN Millenium Development Goals include targets such as abolishing extreme hunger and halving the rates of poverty, the promotion of gender equality and the empowerment of women, and environmental sustainability. These goals should be met by 2015.

⁷² The Constitution of the Republic of South Africa. Section 9.3..

⁷³ Ibid.

⁷⁴ Abrahams 2010.

⁷⁵ Ibid.

⁷⁶ This discussion of international agreements and their consequences is taken from Abrahams 2010.

The African Union Protocol to the African Charter on Human and People's Rights on the Rights of Women in Africa and the Southern African Development Community Protocol on Gender and Development also guarantee gender equality and the participation of women in policy-making.

Gender-mainstreaming means that policies must not only take account of women's particular needs, but should also seek to advance the status of women. Gender mainstreaming *"is the process of assessing the implications for women and men of any planned action, including legislation, policies or programmes, in all areas and at all levels"*⁷⁷ and is a globally accepted strategy for promoting gender equality. In turn, gender equality is a necessary component of development goals such as poverty alleviation and sustainable development.

This chapter has discussed the ways in which energy poverty – the use of inferior fuels – can exacerbate economic poverty, and why this impacts women more than men. Even within households, energy is frequently a female responsibility and impacts the ability of women to care for their families. It should be clear that access to clean and affordable energy promotes women's well-being and status, as well as human development more generally. The South African government has acknowledged its legal duty to make gender-inclusive policy. It is time that this commitment was implemented.



⁷⁷ Ghazaleh 2007.

3. ENERGY POLICY IN SOUTH AFRICA

*“South Africa's energy strategy has demonstrated its leadership position in the developing world on climate change. Over the last few years, the government has also championed the use of low-carbon strategies in sub-Saharan Africa. The government believes that climate change, if ignored, has the potential to undo many of the positive advances made in meeting South Africa's own development goals and MDGs.”*⁷⁸ Barbara Hogan, former Minister of Public Enterprises, 2010.

3.1 Muddling through

Democratic South Africa has struggled to introduce change to its energy sector, despite a raft of policy which aims to reduce Eskom's monopoly, introduce independent power producers, and transform the electricity distribution sector.

South African energy policy has leant towards established interests – such as the three monopolies of Eskom, Sasol, and PetroSA – and large energy users, including major corporates and the mining sector. According to Marquard, direct electricity provision to large energy users such as mining and other industry have dominated Eskom's history. *“(Eskom) Sales to all other customer types (including bulk sales to local authorities) comprised only around 25% in 1950 and only around 38% in 2000,”* he writes.⁷⁹

While this proportion appears to have declined in recent years, large energy users remain influential. According to the Energy Intensive User Group, their 36 members are responsible for around 44% of electricity sales in South Africa. The group's mandate is to promote *“the interests of its members ... to best benefit economic growth and prosperity and the overall development of the Southern African region”*.⁸⁰

Eskom was initially known as the Electricity Supply Commission, or Escom. Its founding chairman, Hendrik van der Bijl, writes in the organisation's first annual report, in 1923, that cheap power is an important factor in promoting industrial development. Escom *“has had in its view from the outset the possibility of assisting industries by means of cheap power,”* he asserted.⁸¹

This view shifted only gradually. Eskom's 1987 annual report sees electricity as *“a key factor in spurring economic development and improving the quality of life of all our people”* and Eskom's task was to ensure that electricity is affordable and available.⁸²

⁷⁸ Hogan quoted in The Mail & Guardian. [Medupi: Hogan answers questions on World Bank loan](#) 11 March, 2010.,

⁷⁹ Marquard 2006: 135.

⁸⁰ Energy Intensive User Group website <http://www.eiug.org.za/about>.

⁸¹ Escom Annual Report 1923:5, quoted in Marquard 2006: 126.

⁸² Eskom Annual Report 1987:cover, quoted in Marquard 2006: 128. lists 4.85 million households and 19.85 million people.

While government encouraged energy-intensive industrialisation, on the back of a ready supply of cheap electricity, Eskom itself enjoyed considerable autonomy with little departmental oversight until the late 1980s. Its prices were not effectively regulated until the formation of the post-apartheid National Electricity Regulator in 1995⁸³ while the organisation enjoyed ready access to South Africa's industrial and political elite, both pre- and post-apartheid.⁸⁴

Eskom deploys considerable political power in its own right, one which appears to be weighted towards its traditional clientele of large energy users. Perhaps it is this political weight which impedes the development of a truly pro-poor energy strategy, rather than one that serves the largest existing consumers.

Eskom's influence is all the greater as political accountability for electricity is split between the departments of energy and public enterprises – the latter being the line manager for Eskom. Climate change policy – which is intimately linked to energy and economic development – falls under the Department of Environmental Affairs. This political fragmentation only increases Eskom's power as it dilutes oversight. In addition, it could mean that efforts to deal with these interlinked issues in a co-ordinated way are undermined.

While Eskom remains influential, gender issues have been marginalised. Gender was previously considered a cross-cutting concern of all departments, but under President Jacob Zuma, a Department for Women, Children and People with Disabilities has been formed. This department appears to have had no input into energy policy. Given the massive gender inequalities South Africa already faces, a gender-blind policy is in fact negative for women, entrenching an already unequal status quo.

Despite a raft of legal obligation and good intentions, South Africa persists in drawing up economic policy that is gender-blind. Often, only cursory attention is paid to gender or to women's positions. Neither the Industrial Policy Action Plan, nor the Integrated Resource Plan makes any reference to gender, in keeping with the technocratic mould of economic policy and energy planning.

The National Climate Change Response Green Paper refers to gender only once, in the following sentence:

“Although vulnerability in urban areas to climate variability is highly varied spatially, racially and along gender and age lines, it is generally accepted that it is the poor who are most vulnerable.”⁸⁵

While the paper gives much attention to “the poor”, with 15 references, “women” receive only two mentions, in addition to the single mention for “gender”. This is a disappointing result given that climate change will profoundly affect human society and gender is an integral part of social relations and affects socio-economic development.

⁸³ Eskom website 2004.

⁸⁴ Marquard 2006: 129.

⁸⁵ Department of Environmental Affairs 2010: 26.

We need to consider how women can be better integrated into the economy, and what obstacles there may be to women's full and active participation. It is clear that our policy makers are not thinking about women's specific and differentiated position, even in areas outside of the energy sphere. For example, the burden of childcare tends to fall on women rather than men. Access to childcare can be a considerable challenge for working women, and to drain incomes which are already lower compared to men's. Maternity leave benefits are still limited, and are not available to self-employed women – an additional financial burden for single parents in particular.

Generally, electricity policy has given chief consideration to the needs of large users, such as mines and industry, rather than those of residential consumers. Energy policy has been not only gender-blind, but also socially blind.

3.2 Moral Hazard and the Risk of Over-investment

South Africa finds itself at a crossroads in terms of its energy policy. Having recently experienced severe supply constraints – in 2008 consumers experienced widespread disruption to their electricity supply – the country is now considering extensive new investment in coal generation capacity, even as it has committed itself to reducing growth in carbon emissions.

Eskom, the only major national electricity generator,⁸⁶ is spending R380 billion on bringing new supply online. Most of this investment will go to Medupi and Kusile, two new coal-fired power stations, with 4 800 MW of capacity each. In order to finance this programme, electricity prices will double between 2010 and 2013.⁸⁷

While the direct result of the tariff increases will hurt consumers and businesses alike, the increase is also likely to push up inflation.⁸⁸

While everyone agrees that South Africa at present faces a constrained energy supply, and that new capacity must be found, the country also runs the real risk of over-investing in electricity supply. The widespread blackouts of 2008, and the realisation that Eskom's electricity capacity had been over-stretched for some years, meant that Eskom's new build programme was quickly approved.

⁸⁶ Of course some companies have started generating power for their own use. Durban and Cape Town both generate small amounts of electricity for their consumers. However, most consumers currently have little option but to rely on Eskom.

⁸⁷ Mail & Guardian 24 Feb 2010 - "<http://www.mg.co.za/article/2010-02-24-eskom-gets-price-hike-inflation-fears-rise>"

⁸⁸ Ibid.

In fact Eskom, and the country, have been in similar situations before, and the decisions made then had far-reaching effects.⁸⁹

According to Steyn, the supply crises South Africa experienced in the 1980s resulted in disastrous decisions for electricity investment. *“South Africa runs the real risk of repeating the mistakes of the past,”*⁹⁰ Steyn warns.

Moral hazard may occur when an agent has an incentive to take a decision on the principal's behalf in the best interests of the agent, rather than the principal. In the case of infrastructure planning, energy planners may be incentivised to take decisions which benefit their organisation, rather than the interests of the general public. According to Steyn, the story of Eskom provides a real-world example of the workings of moral hazard – a phenomenon which Eskom is still subject to.

*“Managers of public electric utilities are subject to moral hazard with respect to their system expansion planning and investment decision making. This means that the technology and investment choices that are likely to be in the best interests of society, are not the same choices that are most likely to be in the best interests of managers, and that managers are able, and tend to, choose investment projects that benefit them most.”*⁹¹

It is hardly worth saying that decisions not made in the best interests of society but in the interests of male-dominated Eskom are also unlikely to be gender-sensitive ones. It seems self-evident that historically, energy policy has not considered gender and neither has it resulted in particularly good outcomes for women.

While consumers are concerned with both the price and the supply of electricity, Eskom's overriding objective was to guarantee the supply of electricity no matter the demand levels. This resulted in chronic over-investment in expensive projects, stranded assets, and a substantial increase in electricity prices.

Due to Eskom's monopoly position, the risk of its investments is shifted onto the consumer. The lack of transparency and public participation in energy planning only exacerbates the situation. *“Eskom investment plans are mostly developed on a confidential basis and are submitted for Cabinet approval before they have been formally evaluated by the National Energy Regulator of South Africa or made available for public comment and reviewed by independent analysts and researchers.”*⁹²

More than seven years after the 2003 Renewable Energy White Paper first called for the introduction of private sector investors in renewable energy, the first power purchase agreements have yet to be signed. This is despite the considerable benefits for job creation renewable energy could bring. By government's own estimates, renewable energy could create up to 400000 jobs in manufacturing, construction, operations and maintenance.⁹³

⁸⁹ Steyn 2006.

⁹⁰ Steyn 2006: 54.

⁹¹ Steyn 2006: 7.

⁹² Steyn 2006: 54.

⁹³ Department of Economic Development 2010.

In the meantime, policy continues to call for investment in energy intensive industries and investment in large scale coal and nuclear resources. All of this indicates that despite the clear need for policy co-ordination and direction, there is instead confusion and fragmentation.

This policy confusion sits alongside the risk of moral hazard – that electricity planners will make decisions that are in the best interest of dominant utilities rather than in the best interest of all South African consumers, including small and residential users.

3.3 A New Vision: The White Paper on Energy, 1998

In 1998, South Africa's first democratic government published the White Paper on Energy. This was the first policy review the sector had seen since 1986, and the fledgling democracy was clear about its priorities. Electricity is a basic need, and all consumers must be able to access electricity at an affordable cost. While urban consumers should derive their electricity from the national grid, rural households should not be left out.

The words of then-Minister of Minerals and Energy, Penuell Maduna, summed up the White Paper's approach.

“Government is committed to the promotion of access to affordable and sustainable energy services for small businesses, disadvantaged households, small farms, schools, clinics, in our rural areas and a wide range of other community establishments... The state must establish a national energy policy which will ensure that the national energy resources shall be adequately tapped and developed to cater for the needs of the nation. Energy should therefore be available to all citizens at an affordable cost. Energy production and distribution should not only be sustainable, but should also lead to improvement of the standard of living for all of the country's citizens.”⁹⁴

The White Paper acknowledges that *“although most household consumers are women, past energy policy has largely ignored their needs”*.⁹⁵ It mentions the need to provide basic electricity, to extend services, and to tackle indoor pollution resulting from a reliance on biomass for cooking. Research into low-smoke fuels *“as a transitional product”* for remotely located and rural households will be promoted.

The policy recognised the need to transform the department's skills base, and gave the Department of Minerals and Energy (DME) a target of 50% black participants and 30% female participants by the year 2000, for all policy development structures, forums, parastatal boards and similar structures. In addition, the DME committed itself to supporting black- and women-owned businesses contracting with government.⁹⁶

⁹⁴ Maduna, Department of Minerals and Energy 1998.

⁹⁵ White Paper on Energy, section 3.3.1. Department of Minerals and Energy 1998.

⁹⁶ White Paper on Energy, section 3.4.8. Department of Minerals and Energy 1998.

A case is made for renewable energy, “particularly for remote areas where grid electricity supply is not feasible”.

“Government believes that renewables can in many cases provide the least cost energy service, particularly when social and environmental costs are included, and will therefore provide focused support for the development, demonstration and applications of renewable energy. In particular, government will facilitate the sustainable production and management of solar power and non-grid electrification systems, such as the further development of home solar systems, solar cookers, solar pump water supply systems, solar systems for schools and clinics, solar heating systems for homes, hybrid electrification systems, wind power. All of the above will be largely targeted at rural communities... Government will also promote appropriate standards, guidelines and costs of practice for renewable energy and will establish suitable renewable energy information systems.”⁹⁷

The policy makes provision for only a limited role for renewable energy, with urban communities still being supplied from the national grid. Over a decade later, most rural communities still do not have ready access to off grid electricity. The blame seems to lie with bureaucratic red tape and a lack of political will.

South Africa has been slow to draw up a renewable energy feed in tariff which would govern the price at which renewable energy producers sell their power to the national grid, and has lagged in signing power purchase agreements.⁹⁸ This has stifled the development of renewable energy in the country despite promises to the contrary.

The White Paper includes a wide-ranging review of the energy landscape of the period, and sought to usher in an ambitious restructuring of the sector. Eskom's generation and transmission businesses would be split into two separate companies, with the aim of allowing private sector ownership of power stations.

Electricity distribution is also to be restructured, according to this policy. Electricity distribution should become the job of five regional electricity distributors, which might also include private sector involvement. The National Energy Regulator – which had been formed through two amendments to the Electricity Act of 1987 – would be given teeth. Government would ensure that price distortions and market failures would be rectified.

⁹⁷ White Paper on Energy, section 3.4.7, Department of Minerals and Energy 1998. - [“http://www.info.gov.za/whitepapers/1998/energywp98.htm”](http://www.info.gov.za/whitepapers/1998/energywp98.htm)

⁹⁸ Van der Merwe 2010. Engineering News, republished by Environment.co.za. Tariffs for renewable energy were published in March 2010.

Electrification of households and small businesses would be prioritised, the policy promised. The Reconstruction and Development Programme, which informed the drawing up of the 1998 White Paper on Energy, described the lack of access to energy in rural areas as one reason why economic development had stagnated outside in these regions.

At this stage, greenhouse gas emissions were not seen as an important issue. In fact, the more pressing environmental problem, as explicitly stated in section 8.4, was perceived to be indoor air pollution from dirty cooking fuels. *“Whilst the long-term ecological sustainability of the energy sector is desirable, government’s current view is that the immediate priority is to address those environmental problems which affect the living conditions of millions of people on a daily basis.”*⁹⁹ Nevertheless, the document warns that environmental concerns could in future impact South Africa’s exports.

Government also wanted to see greater public participation in policy decisions, according to the White Paper. It also admits that electricity prices are likely to rise:

*“Government expects electricity tariffs to become increasingly cost-reflective at all levels of the industry... In future government will expect greater public participation in decisions on large public sector electricity investments, and will require evaluations using integrated resource planning methodologies...”*¹⁰⁰

In addition, energy efficiency would be promoted, not only in the electricity sector, but also in respect of traditional fuels. An appliance-labelling programme is suggested.¹⁰¹

Further, the White Paper warns that energy policies must be carefully co-ordinated with other sectors to avoid unwanted side effects, and that energy on its own could not bring development.

*“For instance a policy of rural electrification will not resolve rural energy poverty on its own. It must be complemented by other policies and programmes, such as social forestry programmes, education and job creation, to have the desired effects. Energy policies must also be co-ordinated between energy sub-sectors. Using the example of rural electrification again, it is necessary to recognise that poor households cannot afford expensive electrical appliances and hence continue to utilise wood, paraffin and other fuels. Supply-side initiatives are therefore also required in other energy sub-sectors too if rural energy poverty is really to be addressed.”*¹⁰²

⁹⁹ White Paper on Energy, section 8.4. Department of Minerals and Energy 1998.

¹⁰⁰ White Paper on Energy, section 3.4.1. Department of Minerals and Energy 1998.

¹⁰¹ White Paper on Energy, section 3.5.3. Department of Minerals and Energy 1998.

¹⁰² White Paper on Energy, section 4.3. Department of Minerals and Energy 1998.

The needs of women as energy consumers are described in detail. Cleaner cooking stoves are seen as the solution to the problems of women in particular, while the benefits of electricity should be accessible to all.

The White Paper clearly recognises that energy is not simply a means for economic growth and development for large companies, but is also a social justice issue. It has, however, only been partially implemented and future energy policy shows a shift away from social justice concerns.

Since then, energy policy in South Africa has focused on two objectives: maintaining energy security, and maintaining energy affordability. While the electrification drive went ahead, government also tried to attract cheap electricity prices to attract energy-intensive industry. Concerns relating to the social impact of energy, including gender and pro-poor policies, have become diluted.



The Cleaner Fires Campaign

One way to reduce the extreme levels of indoor pollution poor households still experience is to teach a method for making cleaner fires. Base njengo Magogo (“to make fire like granny makes”) is a method to demonstrate fire-making in a way that saves coal and produces less smoke. Having been piloted in the eMhlahlenhle community near Secunda and Orange Farm, Gauteng, it is now being rolled out nationally.¹⁰³

Initial studies have claimed significant benefits. This method produces 50% less smoke, compared to a conventional fire, burns longer, and uses around 20% less fuel. Another advantage is that it costs nothing to implement, so there are no upfront costs to the consumer, and it works for all appliances.¹⁰⁴

The pilot study reported an acceptance rate of over 90% of the new method. After one week, 96% of households were using the method every day. The study found that coal use actually increased, with 1.7% of households who used the method not having used coal previously.¹⁰⁵

During weekly follow-up sessions, 11.4% of respondents said they liked the method because it saved coal, while 40.5% of respondents said the fires lasted longer.

The pilot study found that 88% of households reported savings, with most saving half a 25kg bag of coal a week. Over 90% of households used to make a fire twice a day, but now make a fire only once a day. The campaign saved households approximately R26 a month. Three quarters of households noticed less smoke after one month of use, with 67% of households noticing less smoke in the street.¹⁰⁶

While the campaign does have the potential to save emissions, a significant drawback to the campaign is that households still use coal. The campaign does not improve access to cleaner fuels, or higher-grade coal which produces less smoke. Annecke (2003) suggests that from a feminist perspective, a narrow focus on cooking stoves is not ideal, since it enables women to do their existing work more effectively but does not challenge the gender status quo.

The Base njengo Magogo campaign represents a limited attempt to engage with female energy consumers but it should be recognised as a transitional measure. In addition, although the policy attempts to consider gender, it does not represent a meaningful change in women's situations. Women, and often their children, are still exposed to coal smoke and their drudgery is unrelieved.

¹⁰³ Van Niekerk and Swanepoel 1999, cited in Wentzel 2006.

¹⁰⁴ Surridge et al 2004.

¹⁰⁵ Wentzel 2006.

¹⁰⁶ Surridge et al 2004.

3.4 A false dawn: The White Paper on Renewable Energy, 2003

Five years after the 1998 Energy White Paper, the White Paper on Renewable Energy was gazetted in November 2003.¹⁰⁷ Implementation of this paper has been even more limited than its predecessor. The paper is currently under review.¹⁰⁸

The White Paper on Renewable Energy was intended to supplement the overarching vision drawn up in 1998. It admits that *“coal is, and is likely to remain... an attractive source of energy for South Africa”*.¹⁰⁹ At the same time, *“while South Africa is well endowed with renewable energy resources that can be sustainable alternatives to fossil fuels, so far these have remained largely untapped”*.¹¹⁰

This policy aims to create the conditions for the development and commercial implementation of renewable technologies. Private sector investors are seen as necessary for successful implementation. *“The focus will be on delivery,”* it promises.¹¹¹

By this stage, government was becoming more aware of greenhouse gases and their importance.

“It is the intention of the Government to make South Africa's due contribution to the global effort to mitigate greenhouse gas emissions. For this purpose, the Government will develop the framework within which the renewable energy industry can operate, grow, and contribute positively to the South African economy and to the global environment,” the paper states.¹¹²

Energy security is another policy driver for renewable energy, with dollar-denominated imported fuels imposing a heavy burden on the economy. The policy expresses a concern that coal-dependent South Africa is vulnerable to trade barriers developed countries could implement in response to climate change.

Government's role, according to the White Paper on Renewable Energy, would be to introduce fiscal and financial support mechanisms within an appropriate legal and regulatory framework, to allow renewable energy technologies to compete with fossil-based technologies.¹¹³

The White Paper on Renewable Energy sets a target of 10 000 GWh of renewable energy to be achieved by 2013, to be produced mainly from biomass, wind, solar and small-scale hydro. This target is equivalent to 4% of projected electricity demand for 2013.¹¹⁴

At the time, the White Paper was criticised for an overly modest target which did not provide sufficient clarity to investors. Yet even this target has not been achieved, seven years later.

Biomass-based cogeneration, solar water heating, wind, and small-scale hydro are viewed as *“early win”* investments, and a *“phased, flexible strategy”* will be needed to achieve this target, although finance is viewed as a potential constraint.¹¹⁵

¹⁰⁷ The paper also considers the contribution renewable energy can make to liquid fuels. However, liquid fuels fall beyond the scope of this analysis and is thus not discussed.

¹⁰⁸ At the time of writing it was not known when the review would be completed.,

¹⁰⁹ Department of Minerals and Energy, 2003: vii.

¹¹⁰ Op cit, p. vii.

¹¹¹ Op cit, p. xiii.

¹¹² Op cit, p. vii-viii.

¹¹³ Op cit, p. 5.

¹¹⁴ Op cit, p. I.

¹¹⁵ Op cit, p. ix.

Carbon Finance

The White Paper on Renewable Energy admits that financing renewable energy will be difficult . *“South African funds available for this purpose are constrained by the need to provide funds for high-priority national activities, and the magnitude of the funds available from international sources such as the Clean Development Mechanism (CDM) has not yet been established. However there is a large potential for finance, available from international sources such as the Prototype Carbon Fund (PCF), bi-lateral assistance and private sector investment.”*¹¹⁶

The CDM was established under the Kyoto Protocol. It is a mechanism by which developed countries can offset their carbon emissions by investing in clean development projects in developing countries. The saving in emissions represented by the clean development investment, as opposed to a similar business-as-usual investment in that industry, is then awarded as carbon credits which can be bought and sold. In South Africa, relatively few CDM projects have been registered, compared to countries such as China, Brazil, and India, which have attracted the lion's share of projects.

Although the revenue stream made possible by carbon credits can help to finance cleaner projects, this is available only once projects are operational. Development costs and seed finance may also be necessary to induce developers to take on projects.

The PCF, managed by the World Bank, became operational in 2000 with \$180 million in capital. The aim was to pioneer investment in greenhouse gas emission reduction projects.

Although carbon financing of the type described above is not necessarily detrimental to women, it is also not particularly beneficial. Larger projects tend to win finance because the amount of carbon credits generated by these projects can better offset the costly and bureaucratic process of applying for CDM accreditation.

¹¹⁶ Op cit, p viii.

Barriers to implementation, as described in the White Paper, include the relative expense and higher capital costs of renewable energy technologies. These technologies may need support for relatively long periods before reaching profitability. In addition, the current system of energy services is based on centralised development around conventional sources of energy and there is a lack of non-discriminatory open access to the national grid and other elements of key energy infrastructure. Consumer awareness is lacking. Financial, legal, regulatory and organisational barriers need to be overcome in order to implement renewable energy technologies and develop markets. Finally, market power of utilities is also listed.¹¹⁷

Generation licences, grid connections, power purchase agreements, open access to the national electricity grid, and tariff structures will all need to be developed, regulated and implemented.

The policy also commits itself to *“actively involve women in decision-making and planning and promote empowerment in renewable energy programmes or activities”*.¹¹⁸

In addition, section 9.6 of the White Paper on Renewable Energy considers the gender disparities involved in energy use, with rural women's reliance on fuel wood for energy. It concludes that *“sustainable energy development could have a positive impact for women”*¹¹⁹ but this can only be realised when women's concerns are properly reflected in energy policy and there is more emphasis on end-users. Women's non-market time should be recognised as human energy and energy policy should seek to relieve this burden. Women need to be involved in policy formulation and planning, and women should be assisted to develop entrepreneurial skills through productive use of renewable energy technologies.

Women should be actively involved in decision-making, says section 9.6 of the White Paper on Renewable Energy. Policies should promote empowerment, according to section 8.4 of the White Paper, and training and support should be offered to women, who are under-represented in the energy sector.

In practice, this section of the policy bears little relation to the rest of the document, which appears to regard women's energy needs as an afterthought. These energy needs are not strongly addressed by the policy, which does not prioritise rural areas and off-grid electrification.

In addition, women are viewed as victims of their poverty, who must be assisted to develop entrepreneurial skills.

Susan Shabangu, then Deputy Minister of Minerals and Energy, acknowledges the problems rural women face in obtaining energy in her foreword to the policy:

*“However, the easier entry points for renewable energy are generally not in the remote rural areas, but in the urban household and industrial sectors. It is here that the possibilities for solar water heating, and the use of waste for power generation lie.”*¹²⁰

¹¹⁷ Op cit, p viii.

¹¹⁸ Op cit, p. 35.

¹¹⁹ Op cit, p. 39.

¹²⁰ Shabangu, Department of Minerals and Energy, 2003.

She takes up the same theme again in the next paragraph. *“Notwithstanding the legitimate needs in rural areas, commercial realities and the pressing demands made of our limited Fiscus, dictate that our initial ventures into renewable energy will be among the larger and more economically viable projects such as electricity from sugar mill bagasse and paper mill waste. It is sincerely hoped that this policy will provide certainty about our future direction and commitment.”*¹²¹

Previously renewable energy had been seen as a solution mainly for remote rural communities, as described in the 1998 Energy White Paper. But Shabangu's comments above indicate that in 2003, renewable energy was being seen as a technology which could deliver large amounts of power and could be suited to urban communities. Moreover, renewable energy should be deployed first in urban communities, given the limited finances available for it.

In fact, the White Paper on Renewable Energy seems to be the same old South African story: energy supply is to be prioritised for large consumers, while individuals – particularly poor ones – should wait their turn.

However, this White Paper has had little practical impact. Very little renewable energy has been incorporated into the national grid, with the exception of a few demonstration projects. Rural women still spend hours collecting fuel wood and are still exposed to indoor air pollution.

¹²¹ Ibid.

Some Women at the Top

There have been moves to support women's participation in energy, a traditionally male-dominated industry. Groups such as Women in Nuclear South Africa and Women in Oil and Energy South Africa advocate for greater participation in energy-related professions, but do not have a policy-making function. It is also notable that democratic South Africa has frequently appointed female ministers to head up the energy portfolio (which was previously combined with minerals). At present the following women hold ministerial positions within the energy sector: Nelisiwe Magubane (Director-General, Department of Energy), Barbara Thompson (Deputy Minister of Energy) and Dipuo Peters (Minister of Energy).

But women continue to be under-represented in these industries. Eskom's 2009 annual report reveals that only 29% of its workers are female, with 35% of its managers being female. Between the period 2000 and 2005, women made up only 8,6% of all engineering professionals in the country, according to HSRC data, compared to 11,7% for the period from 1996 to 1999. However the number of female engineer and technologist graduates has surged from 8% in 1996 to 21% in 2005.¹²²

Although some women are now to be found at the top of the energy chain, key decision-makers are still predominantly male. Of the 16 members of the technical advisory committee in charge of drafting the Integrated Resource Plan 2010, only two – Nelisiwe Magubane and her colleague Ria Govender – are female.¹²³

EDI Holdings, which is intended to facilitate the restructuring of the national electricity distribution sector, has a female CEO, Phindile Nzimanda. She is the only woman listed among 15 directors.

The National Energy Regulator of South Africa (Nersa) has a female majority. Chairperson Cecilia Khuzwayo is female as well as three out of seven regulators.

Of the 15 directors listed by The Nuclear Energy Corporation of South Africa (Necsa) in its 2010 annual report, six are female. CEO Rob Adam is male, as is chairperson Manne Dipico.

Three of the Central Energy Fund Group's nine directors are female, including chairperson Busisiwe Mabuza.

Two out of Sasol's three executive directors are female, and two of the seven non-executive directors.

¹²² Roodt and Breier 2009.

¹²³ McDaid 2010.

Four out of 13 directors at Eskom are female, and they are all non-executive directors. Erica Johnson, chief officer for customer network business, is the only female representative on Eskom's executive committee.

Historically, powerful consumers have been able to influence South Africa's energy policy in their favour. Both the chairman of the Energy Intensive User Group and his deputy are male.¹²⁴ The Chamber of Mines has five women out of 15 top managers.¹²⁵ Business Leadership South Africa, which represents South Africa's largest corporations and major multinational companies, lists one woman – Maria Ramos - among its 27 board members.¹²⁶

3.5 Climate Change and Society

Climate change hearings organised by Oxfam in 2009 indicated that African women are particularly affected by climate change. Subsistence farmers told audiences, including Ireland's former president Mary Robinson, that drought caused by climate change impacted women's ability to provide food for their families, and even forced them into sex work. When the rains eventually came, floods were too often the result, washing away the worldly goods of entire communities.¹²⁷

Since women are particularly impacted by climate change, women should be consulted in the policy intended to address climate change impacts.¹²⁸ And policy makers have overlooked the impact that climate change will have on poor communities, according to Masego Madzwamuse.¹²⁹

“Current climatic shocks and stresses already have a devastating impact on vulnerability of the poor. The poor generally have a limited number of coping strategies upon which to draw from in times of stress.”

This is particularly important as South Africa has a history of social disruption and displacement that has further weakened poor communities' coping ability.¹³⁰ Social, community and gender benefits must be considered upfront when drawing up policies for climate change and renewable energy – just as they should be with any other kind of policy.

¹²⁴ Energy Intensive User Group website.

¹²⁵ Chamber of Mines website.

¹²⁶ Business Leadership South Africa website.

¹²⁷ More information on this initiative is available here: "<http://www.oxfam.org/en/campaigns/climatechange/climate-hearings>". The author of this paper was present at climate change hearings held in Cape Town in 2009. For a report of the hearings, see Newmarch, J, Business Day, 6 October 2009. "<http://www.businessday.co.za/articles/Content.aspx?id=83171>". accessed on 7 December 2010.

¹²⁸ UN Population Fund.

¹²⁹ Madzwamuse, 2010.

¹³⁰ Madzwamuse, 2010: 2.

3.6 South Africa's climate change policy

South Africa has come under considerable international pressure to rein in its greenhouse gas emissions. Despite its status as a developing country, it is one of the world's largest emitters. The Energy Information Administration, which collects energy statistics from the US Government, estimates that South Africa emitted 482,88 million tons of carbon dioxide in 2008 and 450,44 million tons in 2009. The 2009 figure is equivalent to 9,18 tons per capita.¹³¹ In 2009 President Jacob Zuma made a voluntary offer ahead of the Copenhagen climate summit.

Zuma stated that by 2020, South Africa, would cut its emissions by 34% compared to a business as usual growth path. By 2025, the potential emissions which would have occurred on a business as usual trajectory would be 42% lower than otherwise expected.¹³² However, there is still little clarity as to how this will be measured or achieved.

Zuma was careful to make his offer conditional on international support for financing emissions reductions and technology transfer, as well as reaching a fair and legally binding international agreement on climate change.¹³³

Some international opinion suggests that this shift to a so-called green economy is one which countries should do anyway, because it brings more opportunities than it does costs, such as investment, innovation, jobs, and competitive advantages in trade. Sir Nicholas Stern, author of the influential 2006 report *"The Economics of Climate Change"*, suggested as such at the 2010 United Nations climate change summit in Cancun, Mexico.¹³⁴

Ambitious policy to rein in greenhouse gases mean that investment is redirected into energy efficiency, renewable energy, and associated technology development and manufacturing. South Korea has aggressively invested in its green economy because of the job creation and economic development potential it holds.

¹³¹ The Guardian, 31 January 2011.

¹³² Zuma 2009.

¹³³ Zuma. "<http://www.presidency.gov.za/pebble.asp?relid=555>"

¹³⁴ Stern is also a member of the UN Secretary General's High Level Advisory Group on Climate Finance. He was speaking as an audience member, during the release of this report.

3.7 The Long-Term Mitigation Scenarios, 2008

South Africa's voluntary offer was informed by an enormously complicated document known as the Long-Term Mitigation Scenarios (LTMS). This process was launched in 2006, with widespread consultation, and presented to the Cabinet in 2008, where it was duly approved. The LTMS, as it is universally known, “set the strategic direction for climate action in South Africa”.¹³⁵

They were championed by then Minister of Environmental Affairs and Tourism Marthinus van Schalkwyk¹³⁶ and set out several scenarios for South Africa's greenhouse gas mitigation strategy. According to Van Schalkwyk, government's vision for climate policy, based on the LTMS, is built on six policy directions, listed as:

- Theme 1: Greenhouse gas emission reductions and limits
- Theme 2: Build on, strengthen, and/or scale up current initiatives
- Theme 3: Implementing the “*Business Unusual*” call for action
- Theme 4: Preparing for the future
- Theme 5: Vulnerability and adaptation
- Theme 6: Alignment, co-ordination and co-operation

“Our climate response policy... will be informed by what is required by science, namely to limit global temperature increase to 2 degrees above pre-industrial levels,” he said.¹³⁷

Capacity to adapt to climate change must be built, “most importantly by enhancing early warning and disaster reduction systems and in the roll out of basic services, water resource management, infrastructure planning, agriculture, biodiversity and in the health sector”.¹³⁸

The policy also allows for greenhouse gas emissions to continue to grow in the short term, before eventually declining – in Van Schalkwyk's phrase, to “*peak, plateau and decline*”. Greenhouse gas emissions must stop growing at the latest by 2020-2025, stabilise for up to 10 years, then decline in absolute terms.

Over the long term, the economy would be structurally transformed from an energy-intensive economy to one that is climate-friendly, by implementing a pro-growth, pro-development and pro-jobs strategy.¹³⁹

¹³⁵ Van Schalkwyk 2008.

¹³⁶ Van Schalkwyk 2008. "<http://www.info.gov.za/speeches/2008/08072816451001.htm>".

¹³⁷ Van Schalkwyk 2008.

¹³⁸ Van Schalkwyk 2008.

¹³⁹ The previous paragraphs outlining government's climate policy were all taken from Van Schalkwyk 2008.

The LTMS describes in detail the effects climate change is likely to have on South Africa, including the water and agricultural sectors, and considers the economic impact on households and employment of various measures to reduce emissions. But it privileges biophysical descriptions of the impact climate change is likely to have, without considering the socio-economic impact. Even when considering the impact of mitigation measures – rather than climate change itself – on households, it does so without considering the differing impact on women and on men, and on the disparity in income levels.

The resulting document does not consider gender perspectives or mention gender as an area that climate policy should take account of. This may stem from the document's consideration of climate change as largely a technical issue – the mitigation of greenhouse gas emissions – rather than one of adaptation, which is more readily acknowledged as having a social impact.

Since South Africa's climate change policy derives largely from the LTMS, this means that an opportunity to include gender in the debate has been lost, and that gender has been written out of this policy area.

We need to consider the social impacts of climate change in more detail, in order to make policy which better responds to these issues. This includes gender, but also poverty, as well as the impact climate change may have on different communities. Rural people (particularly women), for example, are likely to be more vulnerable to climate change. Without targeted support for these communities, poverty could increase in rural areas.

3.8 The Integrated Resource Plan 2010

The Integrated Resource Plan for 2010, universally known as IRP 2010, aims to map South Africa's energy needs and investment requirements for the next 20 years. Released in draft form for comment, the plan focuses squarely on the electricity sector rather than on energy or resources in a broader sense. The Inter-Ministerial Committee on Energy (IMC) described it as:

“... a 20 year electricity capacity plan. It aims to provide an indication of the country's projected future electricity demand, how this demand could be met and what it would cost to do so. It is not a plan that deals with the overall energy needs of the country nor does it deal with the wider infrastructure plan for the country.”¹⁴⁰

According to the IMC, the plan seeks to balance carbon emissions with the cost of electricity production, security of electricity supply, the creation of sustainable jobs and water usage. The scenarios considered include various hypothetical greenhouse gas emission limits and a carbon tax, and the effect this would have on the electricity sector.¹⁴¹

“Central to the development of IRP 2010 is the vexing question of 'cost of electricity production' versus the country's objective of limiting carbon emissions,” the statement continues. Policy needs to balance these two objectives despite a host of unknowns *“Including the extent of financial incentives necessary to support the transition to a low carbon economy”*.¹⁴² The result is the Revised Balanced Scenario (RBS), as it is called in the IRP 2010.

¹⁴⁰ Inter-Ministerial Committee on Energy 2010.

¹⁴¹ Inter-Ministerial Committee on Energy 2010.

¹⁴² Inter-Ministerial Committee on Energy 2010.

Under the RBS, base load coal would constitute 48% of the country's electrical energy mix by 2030. Base load nuclear would constitute another 14%, while dispatchable renewable energy would constitute 16% of the mix. Peaking open cycle gas turbines would make up a further 9% of the mix, with 6% pump storage. Mid-merit gas would constitute 5%, while base load hydro's share of 2% would be imported.

Considerable public attention, including from civil society, has focused on the IRP 2010 because of its potential to determine South Africa's energy future and economic direction for several decades. Decisions taken now on energy planning will likely still have impact in 40 to 60 years, in the case of large units of generation capacity.¹⁴³

The IRP 2010 is an extraordinarily difficult document to comprehend. The executive summary alone is more than 40 pages long, and the full policy is more than 80 pages. Acronyms, technical terminology and jargon are used throughout the document, with few of these terms being defined. There is little explanation, for example, of what is meant by "*regional development*". One is therefore unsure of whether this relates to development of the Southern African Development Community region, rather than regions within South Africa.

The language used is so technical and so exclusionary that surely only engineering professionals can make sense of the document without difficulty. Engineers, however, do not approve policy and legislation – politicians and public officials do. For this reason it is important that policy documents, far from retreating to technical jargon should be understood by a range of different people, including social scientists, lawyers, economists, accountants, and interested citizens.

In itself, this is a serious flaw in the document which impedes full participation and understanding not only by stakeholders, but surely also by policy makers with diverse qualifications, not all of them technical. It is not clear that decision makers – as the document stands – would really understand the significance of the IRP 2010's recommendations.

However, a second point must also be made. Electricity planning is a sector intimately linked to society and economic development. The language of the IRP 2010, and its lack of interest in the impact of its scenarios, leads one to suspect that there was little internal consultation within the department itself, or with other departments. Although annual GDP growth of 4% is assumed, there is no explanation as to why this level of growth was assumed, or whether it is appropriate.

In addition, the IRP 2010 fails to put forward a macro-economic analysis of the type of economy South Africa is likely to have in 20 years, or the kind of economic growth which would be desirable. A long term electricity plan of this nature should begin by describing the vision which its object is to achieve.

Although the plan concerns itself exclusively with electricity provision, it also relies on inadequate data. While it admits that there is "*insufficient data*" on the potential for demand side management, for instance, it makes no attempt to estimate this potential or include findings from similar countries.¹⁴⁴ In this case, a more rational response would be to consult widely with stakeholders and to encourage public participation in the process.

¹⁴³ McDaid 2010.

¹⁴⁴ Trollip et al 2010

Inaccurate cost assumptions are used. The cost of building nuclear power stations is probably an underestimate. The assumed cost of renewable energy is likely to be too high as it does not take account of the likelihood that costs will drop as technologies mature.¹⁴⁵

Other electricity sector initiatives, such as the National Electrification Programme and the solar water heating programme, are not considered.

Questions can be raised about the IRP 2010's integration with other policy documents issued by government. It appears to consider an energy intensive path for development, which is at odds with government's stated commitment to labour intensive, green economy.¹⁴⁶

Economists talk about the concept of opportunity cost. Simply put, resources are limited. Money spent on one set of goods or services means that less money is available for other purchases. Investment into large-scale energy infrastructure of the type envisaged by the IRP 2010 means that less money is available for other national priorities, such as health and education, and indeed other energy priorities such as electrification, free basic electricity, and enhanced public transport.

This is at a time when 2,5 million households still lack access to electricity, and when a quarter of households still rely on biomass for cooking and thermal energy.

Civil society has raised a number of serious concerns regarding the content of the IRP 2010, and the process of drawing up this policy. These concerns were compiled in a report by Liz McDaid and supported and endorsed by a total of 33 organisations.



¹⁴⁵ Trollip et al 2010.

¹⁴⁶ Trollip et al 2010.

Several stakeholders have noted that the public participation process has been inadequate, as public hearings were advertised only in the mainstream print media and comments may only be made via the department's website. This further excludes the ability of citizens to participate in this process.

While women were previously recognised as important consumers of energy – in the 1998 White Paper for example – the IRP 2010 is a gender-blind document. In this regard a joint presentation by the Gender and Energy Network of South Africa, Gender CCSA – Women for Climate Justice, and the Commission on Gender Equality states:

“There is no mention of women nor [of] gender in the entire IRP 2010 document even though approximately 41% of the households in SA [South Africa] are female-headed households which are extremely poor and affected by energy poverty and often rely heavily on biomass.

Women and children, particularly girl children, continue to bear the burden of collecting firewood, cooking with dirty fuels and living with poor quality lighting.

Energy interventions often focus on tariffs and guaranteeing supply and thus ignore the non-connectedness of the many poor people in SA. The poor including women, often pay more for their energy through paraffin, candles or batteries, or through the use of their time fetching wood.”¹⁴⁷

According to GENSA, GenderCC, and CGE, the IRP 2010 “perceives energy access as simply a technical problem”¹⁴⁸ and focuses on energy security for the mainstream, industrially-based economy, rather than universal access to appropriate, clean energy:

“Energy supply is seen in the context of ensuring those who already have energy (largely corporate) continue to receive it without interruption and lacks recognition that energy plays a vital role in the local small scale economy – that it may be used to operate a single sewing machine for making clothes or a handheld carpentry tool for making furniture.”¹⁴⁹

The IRP 2010 also fails to consider the job creation potential of energy production and how this may differ as technology and investment choices are made, and fails to consider energy allocation for the rural sector.¹⁵⁰

While the IRP 2010 fails to consider residential consumers, women, or gender in the document, perhaps even more problematic is the difficulty ordinary people face in participating in this policy process. In addition to limited access to the document, it also uses problematic language which ensures that only a limited few are able to engage with the document. In this it is fundamentally undemocratic, and this is unacceptable as it is a document which will have real implications for all South Africans.

¹⁴⁷ GENSA et al 2010: 3.

¹⁴⁸ GENSA et al 2010:4.

¹⁴⁹ GENSA et al 2010:4.

¹⁵⁰ GENSA et al 2010:4.

3.9 National Climate Change Response Green Paper, 2010

Climate change policy in South Africa is still in its infancy. Though politicians talk about the need to reduce growth in greenhouse gas emissions and greening the economy, in practice government continues to plan coal and nuclear power stations.

The National Climate Change Response Green Paper – a discussion paper of a likely future climate change policy – was released in 2010 and “presents the Government’s vision for an effective climate change response and the long-term transition to a climate resilient and low-carbon economy and society”.

¹⁵¹

Climate change, according to the paper, is one of the greatest threats to sustainable development and could potentially undermine development goals,¹⁵² but it fails to explain how this will occur.

While the draft document does refer to the particular vulnerability of poor people, many of whom are women, its approach is primarily concerned with the impact of climate change on economic sectors, geographical areas and biological diversity.

It is not primarily a people-centred document, but one which is focused on the economy. This risks glossing over the real social impacts climate change is likely to have, while failing to set real and ambitious targets for the economy. As previously noted, there is still insufficient information on the adaptation strategies South Africa should follow, and how climate change will impact communities.

Since the energy sector is responsible for over 80% of South Africa’s emissions,¹⁵³ climate change mitigation must focus on this sector. Mitigation strategies include energy efficiency, renewable energy, and nuclear. An assessment of the opportunities and costs of the low carbon transition must be prioritised. Renewable energy technologies which are most suitable for widespread roll-out should be identified.¹⁵⁴

Future energy planning should also take account of the peak, plateau and decline trajectory described in the LTMS and in the voluntary offer at Copenhagen. This should be done through “the diversification of our energy mix, the implementation of far reaching energy efficiency measures, investments in the development of new and cleaner technologies and industries and the initiation of the transition to a low-carbon economy”.¹⁵⁵

Traditional sources of energy such as coal and nuclear also receive attention. While South Africa will continue to invest in coal power, the Green Paper promises to invest in “new and clean coal technologies and efficient technologies” with more stringent thermal efficiency and emissions standards for coal-fired power stations.¹⁵⁶

¹⁵¹ Department of Environmental Affairs 2010: 5.

¹⁵² Department of Environmental Affairs 2010: 4.

¹⁵³ Department of Environmental Affairs 2010.

¹⁵⁴ Department of Environmental Affairs 2010: 13.

¹⁵⁵ Department of Environmental Affairs 2010: 14.

¹⁵⁶ Department of Environmental Affairs 2010: 15.

The Green paper proposes that nuclear energy potential must be explored and further developed. A nuclear power station fleet with a potential of up to 10GWe is planned by 2035, with the first reactors commissioned from 2022. Carbon capture and storage, which at this stage is not yet commercially feasible and requires vast amounts of water, will also be supported.

The measures given above resemble a grab-bag – an attempt to keep all the options open. South Africa will pursue renewable energy, but it will also invest in clean coal and nuclear, and support carbon capture and storage. It appears to be an attempt to have one's cake and eat it.

Like most of the other policies considered in this report, only lip service is paid to gender, which thereafter is not discussed. Not enough consideration is given to the social impacts climate change is likely to have, and how these can be ameliorated. At the same time, real, ambitious targets for the economy are lacking. This is not a policy which can be described as gender-sensitive.



4. LIST OF RECOMMENDATIONS

We have seen that energy in South Africa, while paying lip service to gender considerations, has failed to improve women's access to energy. In order to change this situation, we recommend the following:

- participation;
- greater representation;
- focus on people's needs;
- better housing;
- broader access to electricity;
- renewable energy, particularly for off-grid consumers; and
- subsidies or finance to ensure these measures are affordable.



5. CONCLUSIONS

It should be recognised that development is about change and being able to reach out to women calls for a change in traditional gender relations.” Hespinah Rukato, 2001.¹⁵⁷

South Africa has a legal duty to make gender-sensitive policy. Yet, as we have seen, South Africa's existing policies on climate change and energy have either ignored gender considerations altogether, or paid lip service to them. This needs to change.

Currently, some 2.5 million households remain without access to electricity in South Africa. There are more households which cannot afford to use their electrical connections for their chief energy requirements: cooking and heating. This is a situation which has serious consequences, as these households must use polluting fuels for their thermal energy needs, often with severe health impacts.

Although energy policy is presented in a technocratic paradigm, it has important social consequences which should not be overlooked. Energy access, at its most basic, is about making everyday activities easier, whether they be domestic or commercial.

Researcher Elizabeth Cecelski has offered four guidelines towards ensuring that policy is gender inclusive.¹⁵⁸ Firstly, a data needs and analysis should be done, which would break down energy use, supply and impact by gender. Secondly, integrated approaches, offering a range of solutions, need to recognise the central importance of energy and cooking for poor women and their health implications. Thirdly, women's specific electricity needs in terms of water pumping, agricultural processing, security, work productivity and health need to be addressed. Finally, women need equal access to credit extension in order to purchase renewable energy and training to maintain and operate renewable energy equipment.

Gender-sensitive energy policy is not only about cooking and stoves¹⁵⁹ although this is part of the issue. The free basic electricity policy and the national electrification drive do not go far enough in addressing the most energy-intensive need of these households: cooking.¹⁶⁰ If we are really serious about increasing access to safe, affordable and clean energy, and thus, about sustainable development, gender equity and poverty alleviation, we need to provide energy for cooking. One way to do this is to expand the amount of free basic electricity offered to each household.

A serious intention to support renewable energy in South Africa, including a manufacturing industry and support for renewable energy entrepreneurs, would ultimately benefit both women and men, as job creation would lessen the economic burden on single-earner households and increase overall income. Ambitious renewable energy targets would also help South Africa keep its promise to reduce emissions growth. But this strategy should also be planned properly to ensure that women are not inadvertently excluded.

¹⁵⁷ Rukato 2001: 12.

¹⁵⁸ Cecelski 2002.

¹⁵⁹ Clancy 1999.

¹⁶⁰ Clancy 1999, Cecelski 1998.

5.1 Biogas

Biogas technology is well suited for rural energy use, and is particularly appropriate to South African resources.¹⁶¹ This technology uses human and animal waste to produce energy specifically for cooking, or for household energy. Tens of thousands of biogas generators have been distributed in India. A rural women's co-operative in Costa Rica was able to build 16 digesters in the space of a year. Each plant saves around four tons of carbon dioxide and 3.5 tons of fuel wood.¹⁶²

Biogas offers tangible benefits for women in particular, as it cuts down on the time spent gathering fuel wood, and protects against deforestation. One biogas pilot project in Richmond, KwaZulu-Natal, uses the biogas digesters to produce fertiliser for food gardens as well as energy for cooking. As it uses human as well as animal manure, the project also provides safe sanitation and avoids groundwater faecal contamination.¹⁶³

Biogas to electricity production may also increase local skills levels and open up opportunities for entrepreneurship – both within the production itself and in spin off industries, as consumers have more free time.¹⁶⁴

While small-scale renewable energy may unlock greater benefits for women than large-scale renewable energy, the focus of most energy planners and funders is on large projects. Of the \$162 billion invested in renewable energy in 2009, \$44 billion was spent in China, India and Brazil, with just \$7.5 billion spent in poorer countries.¹⁶⁵ The renewable energy projects which would have the greatest impact on the lives of the poorest consumers experience difficulty obtaining finance. *“A \$300m solar project is much easier to finance and monitor than 10 million home-scale solar systems in mud huts spread across the continent,”* one journalist explained.¹⁶⁶

¹⁶¹ Commission for Gender Equality 2009.

¹⁶² Commission for Gender Equality 2009.

¹⁶³ TradePlusAid Domestic Biogas Project.

¹⁶⁴ Commission for Gender Equality (2009).

¹⁶⁵ Rosenthal, New York Times 2010.

¹⁶⁶ Rosenthal, New York Times 2010.

5.2 Better homes cost less

Promoting energy efficiency in homes is a policy which could have particular benefits for women. We have seen previously that women tend to be responsible for household energy usage and electricity purchase.

Greater insulation within homes would directly impact women's incomes as less money would be spent on space heating, thus increasing overall disposable income, and could also reduce indoor air pollution as well as avoiding greenhouse gas emissions.¹⁶⁷

In 1998, the White Paper on Energy promised government would establish energy efficient building codes and promote their implementation. Many of these measures are relatively low cost. Fuel savings of up to 65% could be achieved if houses were built using elementary solar passive building design.¹⁶⁸

Possible interventions include orienting houses towards the north, which helps the sun to warm homes even in winter; the use of row housing; the installation of ceilings; energy efficient lighting; wall insulation and solar water heaters.¹⁶⁹

Up to this point, too few low-cost homes have been adapted for energy efficiency by government or consumers. Few poor consumers have the spare capital to invest in energy efficiency interventions.

In addition, low cost housing is notorious for poor construction. Sixteen percent of households in subsidised housing say their walls are weak or very weak,¹⁷⁰ while 14% complain their ceilings are weak or very weak. There might be less need for energy efficiency measures if low-cost houses were built properly in the first place.¹⁷¹

Substantial electricity savings have been reported at Kuyasa, in Khayelitsha, Cape Town. Solar water heaters, insulated ceilings, and energy efficient lighting were retrofitted in over 2 300 low cost homes.¹⁷² The number of households spending more than R100 a month on electricity has been decreased by 56%, with reported savings of R50 a month per household.

Paraffin burning has been reduced. Households report that whereas they used to burn up to a litre of paraffin a day during winter, at a cost of around R11 a litre, they have now almost entirely stopped using paraffin heaters. More affluent households have recorded savings of up to R400 a month during winter. An average estimated saving of R150 per house per month during winter has been experienced, depending on their use of energy for heating.¹⁷³

Households have also reported improved thermal comfort and 76% of households have reported a decrease in the frequency of respiratory illness.

¹⁶⁷ Winkler et al 2000.

¹⁶⁸ Department of Energy, undated.

¹⁶⁹ The Department of Energy has adopted a goal of 1 million solar water heaters by 2014, but this is aimed at higher-income and middle class consumers, rather than poor households, many of whom do not have geysers.

¹⁷⁰ Statistics SA 2010.

¹⁷¹ It is well-known that many low-cost houses are substandard. See, for example, Duncan 2010, Houses to Die For?. "<http://www.sacsis.org.za/site/article/452.1>".

¹⁷² Information taken from the Kuyasa Project website. "<http://www.kuyasacdm.co.za/>".

¹⁷³ These results and quotes are also taken from the Kuyasa website.

5.3 Conclusion

It is clear that our economic development path is failing women. Gender-sensitive development takes account of the needs of the most vulnerable consumers and provides meaningful access to energy. But a truly equitable energy policy may involve tackling concerns which appear much broader than access to energy itself – such as women's ability to access finance, and their ability to take part in decision-making and economic activity.

While South African policy has often sought to consider women, often gender concerns have been pushed aside into a separate category. This lack of integration has meant that gender concerns are not prioritised by mainstream policy, and that poor women are considered as a separate category of consumers who need to be uplifted by benevolent government policy. Women's own knowledge of energy and their own priorities for access have not been actively sought out by policy makers.

Access to energy needs to be at an affordable price if it is to be meaningful. Finance for renewable energy systems and more efficient appliances will probably need to be part of a comprehensive energy policy for sustainable development. Energy projects need to be designed with sustainable development as a goal.

Existing policy is often not gender-friendly – or outright ignores gender – in part because policy makers think of energy as a policy instrument which is socially blind. Energy is presented as a technocratic subject which only a few elite experts are able to comment on. It is not seen as a subject which is accessible to ordinary people, including women.

This means that the discussion around energy tends to centre around technical issues such as energy capacity and reserve margin, on the supply side, and tariff increases – which are often framed in the context of being able to afford supply. There is not as much discussion about access to energy, or the energy requirements of particular groups of people.

In addition, energy planners may not be accustomed to considering energy as a social phenomenon – with gendered impacts – as planners in other fields. This reinforces the technocratic paradigm.

Official policy blindness is not inevitable. The 1998 White Paper on Energy, which represents the first attempt to tackle energy policy by a democratic government in South Africa, explicitly recognised that women are important consumers of energy who, up until now, have been overlooked.

This initial commitment to a gender-mainstreaming of energy policy has been progressively watered down in succeeding energy policy documents. One way in which government has sought to tackle women's energy poverty has been to increase access to grid electricity in South Africa – yet this has not proved a panacea, since the poorest households are simply too poor to afford electricity for cooking and heating – their major energy needs.

This report has considered various ways in which gender concerns could be included in policy, including biogas digestors for rural areas, low cost homes which are energy efficient, and a simple survey of consumer preferences for electricity access points. All of these options would make women's lives easier. The time for implementation has come.

6. BIBLIOGRAPHY

- Abrahams, Y (2009). *Plaiting Three Strands: Gender-based Violence as a Cause of Global Warming*. Paper prepared for DAC / HSRC Colloquium on Social Cohesion.
- Abrahams, Y. (2010) *This is our democracy, we fought for it: Women's rights to be consulted on climate change*. Paper presented at the Earthlife Africa Women's Conference on IRPII and NCCRP, Johannesburg.
- Anneck, W (2003). *One Man, One Megawatt, One Woman, One Candle: Women, Gender and Energy in South Africa*. *ENERGIA News*, Vol 6, Issue 1
- Balmer, M (2007). *Energy poverty and cooking energy requirements: The forgotten issue in South African energy policy?* *Journal of Energy in Southern Africa*, Vol 18 No 3.
- Babugura, A, N Mtshali, M Mtshali (2010). *Gender and Climate Change: South Africa Case Study* Heinrich Böll Stiftung Southern Africa
- Barnes, B, A Matthee, E Thomas, N Bruce. (2009) *Household energy, indoor air pollution and child respiratory health in South Africa*. *Journal of Energy in Southern Africa*, Vol 20 No 1.
- Business Day, 8 December 2010. *Tailings Dams and Radioactive Bricks – acid water in Gauteng*. Accessed via <http://www.businessday.co.za/articles/Content.aspx?id=128912> on 8 February 2011.
- Business Leadership South Africa website <http://www.businessleadership.org.za/boardmembers.php> Accessed on 16 February 2010.
- Chamber of Mines website "<http://www.bullion.org.za/content/?pid=63&pagename=Management>". Accessed on 16 February 2010.
- Clancy, J (1999). *Policies, Projects and the Market Empowering Women? Some initial reactions to developments in the energy sector*. Working paper 105, based on paper given at Energia workshop at the University of Twente, November 1999.
- Cecelski, E (1998). *Gender and Poverty Challenges in Scaling Up Rural Energy Access*. Presented at Village Power 98.
- Cecelski, E. (2002). *Enabling Equitable Access to Rural Electrification: Current thinking on energy, poverty and gender*. *ENERGIA News* Vol 5 No 3
- Children of Fire website <http://www.firechildren.org/index2.asp?include=fireburns.htm&catID=4> accessed 7 November 2010
- Commission for Gender Equality (2009). *Commission for Gender Equality Submission to the National Electricity Regulator (Nersa) on Eskom's Revised Revenue Application, Multi-Year Price Determination, 2010/11 to 2012/13*, 14 December 2009.
- The Constitution of the Republic of South Africa (1996).
- Department of Economic Development (2010). *The New Growth Path*.
- Department of Energy fact sheet accessed from www.energy.gov.za/files/esources/renewables/SolarPassive.pdf on 16 February 2011.
- Department of Environmental Affairs (2010). *National Climate Change Response Green Paper*

Department of Minerals and Energy (1998). White Paper on Energy. Accessed via www.info.gov.za/whitepapers/1998/energywp98.htm on 16 December 2010

Department of Minerals and Energy (2003) White Paper on Renewable Energy.

Duncan, J. Houses to Die For? (2010) Published by The South African Civil Society Information Service, 1 April 2010. Accessed via <http://www.sacsis.org.za/site/article/452.1> on 8 February 2011.

Earthlife Africa (2010). Free Basic Electricity: A better life for all?

Energy Intensive User Group website. <http://www.eiug.org.za/about/> Accessed 16 February 2011.

Environment News Service. UN Climate Change Impact Report: Poor Will Suffer Most. 6 April 2007. Accessed via <http://www.ens-newswire.com/ens/apr2007/2007-04-06-01.asp> on 15 February 2011

Eskom (2004). A Decade of Democracy. Published July 2004. Accessed via <http://www.eskom.co.za/about/Additional%20Info%20-%20Annual%20Report/report%202004/decade/decade.htm> on 16 February 2011

Fisher-French, M. (2010) The financial vulnerability of women Mail & Guardian, 24 August 2010. Accessed via <http://www.mg.co.za/article/2010-08-24-the-financial-vulnerability-of-women> on 23 November 2010.

Geere, J, Hunter, P, Jagals, P. (2010) Domestic water carrying and its implications for health in Limpopo Province, South Africa; A mixed methods pilot study. *Environmental Health* Vol 9, No 52.

Gender and Energy Network of South Africa, GenderCCSA – Women for Climate Justice and Commission on Gender Equality (2010). Joint presentation for IRP 2010. The presentation is available on <http://irp2.files.wordpress.com>. Accessed on 16 December 2010.

Ghazaleh, H. (2007) Mainstreaming Gender in Development Policies and Programmes. IAEG Meeting on Gender and MDGs in Arab Region, Cairo 2007.

The Guardian, 31 January 2011, accessed via <http://www.guardian.co.uk/news/datablog/2011/jan/31/world-carbon-dioxide-emissions-country-data-co2> on 3/02/11)

Hogan, B, quoted in The Mail & Guardian. Medupi: [Hogan answers questions on World Bank loan 11 March, 2010](#)

Inter-Ministerial Committee on Energy (2010). Statement of the Inter-Ministerial Committee on Energy Regarding the Release of the Country's Electricity Plan. 7 October 2010.

Kuyasa CDM Project website, www.kuyasacdm.co.za

Maduna, P. (1998) Ministerial Foreword to the White Paper on Energy. Department of Minerals and Energy.

Madzwamuse, M. (2010). Drowning Voices: The Climate Change Discourse in South Africa, Heinrich Boell Stiftung. Accessed from http://www.boell.org.za/downloads/Masego_Madzwamuse_.pdf on 7 December 2010.

Mail & Guardian, 24 Feb 2010 <http://www.mg.co.za/article/2010-02-24-eskom-gets-price-hike-inflation-fears-rise>

Marquard, A, (2006). The Origins and Development of South African Energy Policy. PhD thesis, University of Cape Town. Accessed via <http://www.erc.uct.ac.za/Research/publications/06Marquard%20PhD%20Thesis.pdf> on 8 February 2011.

McDaid, L. (2010) Power to the People: Raising the voice of civil society in electricity planning – Integrated Resources Plan 2010 inputs and departmental responses.

Newmarch, J, Business Day, 6 October 2009 <http://www.businessday.co.za/articles/Content.aspx?id=83171> accessed on 7 December 2010.

Organisation for Economic Co-operation and Development and International Energy Agency (2010). Energy Poverty – How to make modern energy access universal?

Oxfam International and Earthlife Africa Johannesburg. (2009) Climate change, development and energy problems in South Africa: Another world is possible.

Reddy, Y, (2008). An Exploration of Household Energy Use Patterns Among Grid-Electrified Households in Low-income Rural and Peri-Urban Communities in South Africa. Masters thesis, University of Cape Town.

Shabangu, S (2003). Deputy Minister's Foreword. White Paper on Renewable Energy. Published by the Department of Minerals and Energy.

Surridge, AD, Asamoah, JK, Chauke, GR, and Grobbelaar, CJ (2004). Strategy to combat the negative impacts of domestic coal consumption. Domestic Use of Energy Conference.

Roodt and Breier (2009). "Desperately seeking engineers", HSRC Review, Volume 7, No 1. Accessed via http://www.hsrc.ac.za/HSRC_Review_Article-133.phtml on 1 February 2011

Rosenthal, E. (2010). In Kenya, Huts Far Off the Grid Harness the Sun. The New York Times, 24 December 2010. Accessed via <http://www.nytimes.com/2010/12/25/science/earth/25fossil.html?ref=elisabethrosenthal>

Rukato, H. (2001) Gender and Energy in the South: A Perspective from Southern Africa. Background Paper for the Expert Workshop "Gender Perspectives for Earth Summit 2002: Energy, Transport, Information for Decision-Making", Germany. Paper commissioned by UNED Forum.

SABC News. 2.5 million households without electricity in SA. 4 March 2009. Accessed via <http://www.sabcnews.com/portal/site/SABCNews/menuitem.5c4f8fe7ee929f602ea12ea1674daeb9/?vgnnextoid=c9817da6371df110VgnVCM10000077d4ea9bRCRD&vgnnextfmt=default> on 15 February 2011.

Statistics SA (2010). General Household Survey 2009.

Stern, N. (2010) Verbal comment during side event. Cancun 2010, release of report by UN Secretary General's High Level Advisory Group on Climate Finance. Sixteenth Conference of the Parties to the Kyoto Protocol, 2010.

Steyn, G. (2006) Investment and Uncertainty: Historical experience with power sector investment and its implications for current challenges. Graduate School of Business, University of Cape Town, 2006.

Tinto, E and Banda, K (2005). The Integrated National Electrification Programme and political democracy. In: Journal of Energy in Southern Africa, Vol 16 No 4.

Trollip, H, Nakhooa, S, Pienaar, G (2010). Submission on Integrated Resource Plan for Electricity. Revision 2 of 2010. Idasa. Accessed from <http://irp2.files.wordpress.com/2010/12/submission-irp2-idasa-10dec2010.pdf> on 16 December 2010.

Trade Plus Aid Domestic Biogas Project, accessed via http://www.tradeplusaid.co.za/index.php?option=com_content&view=article&id=11&Itemid=14 on 8 February 2011

United Nations Development Programme (2004). Gender & Energy for Sustainable Development: A Toolkit and Resource Guide.

United Nations Secretary-General (2010). Secretary-General Names Members of High-Level Advisory Group on Mobilising Climate Change Resources. 4 March 2010. Accessed via <http://www.un.org/News/Press/docs/2010/sga1223.doc.htm> on 15 February 2011.

Van der Merwe, C. Sceptical about SA's 2013 renewable target. 22 May 2010, Engineering News, republished by Environment.co.za. Accessed via <http://www.environment.co.za/global-warming-climate-change-renewable-energy/sceptical-about-sas-2013-renewable-target.html> on 16 February 2011.

Van Niekerk (2006). From technology transfer to participative design: a case study of pollution prevention in South African townships. *Journal of Energy in Southern Africa*, Vol 17 No 3, August 2006.

Van Schalkwyk, M (2008). Media statement, 28 July 2008, accessed on <http://www.info.gov.za/speeches/2008/08072816451001.htm> on 25 November 2011

Wentzel, M. (2006). Granny shows the way: Results from implementing an alternative fire-lighting method in Orange Farm. *Journal of Energy in Southern Africa*, Vol 17, No 2. Accessed via <http://www.erc.uct.ac.za/jesa/volume17/17-2jesa-wentzel2.pdf> on 8 February 2011.

Winkler, H (undated). Long-Term Mitigation Scenarios Project Report. Accessed via http://www.erc.uct.ac.za/Research/LTMS/LTMS_project_report.pdf on 25 November 2011.

Winkler, H, Spalding-Fecher, R, Tyani, L. (2000). Cost-benefit analysis of energy-efficiency in low-cost housing. Energy & Development Research Centre, University of Cape Town.

Zuma, J. (2009) Address by President Jacob Zuma at UN Climate Change Conference, 18 December 2009. <http://www.presidency.gov.za/pebble.asp?releid=555> Accessed 6 November 2010.

Sustainable Energy and Climate Change Partnership (SECCP)

A Project of EarthlifeAfrica Johannesburg

Tel: +27 11 339 3662

Fax: +27 11 339 3270

Email: seccp@earthlife.org.za

Website: www.earthlife.org.za

Written by Jocelyn Newmarch - March 2011

