Policy Regimes in South African Electricity Policy as a Barrier to Reform and Sustainability

Kevin J. R. Foster

fstkev002

Supervisor: Ms Raenette Taljaard

A minor dissertation submitted in **partial fulfillment** of the requirements for the award of the degree of Master of Philosophy in Public Policy and Administration

Faculty of the Humanities

University of Cape Town

2012

COMPULSORY DECLARATION

This work has not been previously submitted in whole, or in part, for the award of any degree. It is my own work. Each significant contribution to, and quotation in, this dissertation from the work, or works, of other people has been attributed, and has been cited and referenced.

Signature: Signed by candidate Date:_____

[word count: 21 367]

Acknowledgements

A number of people are owed a debt of gratitude for the successful completion of this thesis.

First of all, to my parents, Annabelle and Charles Foster, for their love and support throughout the process, without which it would not have been possible.

To Kathryn Hoeflich, for her love, support, incredible patience and, eventually, her assistance with the editing and formatting process.

To Professor Anthony Butler, for igniting my interest in the South African public policy process.

But most importantly to Ms Raenette Taljaard, for her supervision, support, patience and for sharing her exceptional insight into the South African public policy arena. I have thoroughly appreciated and enjoyed working with you.

Contents

Abstract

This thesis examines the South African electricity policy-making regime asking the question "What is the nature of South Africa's electricity policy regime and how does it act as a barrier to reform and the introduction of sustainable energy sources into the South Africa's energy system from 1994 to 2011?" It hypothesizes that a policy regime that amounts to a coalition between energy intensive business, electricity utility Eskom and the Government that has developed in the post apartheid era out of what Fine and Rustomjee called the Minerals-Energy Complex. It hypothesizes that this regime uses its financial and political power and skills asymmetries to ensure policy is made in a supply paradigm, which prefers cheap source of electricity supply to meet growing demand over efficiency and sustainability in the energy system and that this is the major barrier to reform.

The thesis uses policy regime theory and policy paradigms to examine the problem, and uses a qualitative analysis of South Africa's energy policies, public energy hearings and policy implementation indicators, such as budget allocations, to establish the existing power relations in the electricity sector, the preferences of the most powerful players and to determine whether they act as a barrier to reform. The findings agree with the hypothesis in showing that there exists a powerful energy policy regime that amounts to a coalition between energy intensive business, Eskom and Government. It finds that this regime operates in a Supply paradigm that preferences cheap electricity supply over an efficient energy system. However, the thesis also finds that there are two competing policy regimes, a second in the Supply paradigm that has a preference for nuclear energy in future capacity expansion and one in a Supply/Demand paradigm that preferences an efficient energy system that makes significant use of renewable energy sources. It makes the surprising discovery that renewable electricity producers do not form part of the Supply/Demand regime, preferring a system that preferences electricity over other energy sources, guaranteeing them a large market.

List of Acronyms

ACF	Advocacy Coalition Frameworks
ANC	African National Congress
Asgi-SA	Accelerated and Shared Growth Initiative of South Africa
BUSA	Business Unity South Africa
CO_2	Carbon dioxide
Cosatu	Congress of South African Trade Unions
CPUT	Cape Peninsula University of Technology
DME	Department of Minerals and Energy
DOE	Department of Energy
DPE	Department of Public Enterprises
DTI	Department of Trade and Industry
ECB	Electricity Control Board
EIUG	Energy Intensive User Group
ERIC	Electricity Restructuring Interdepartmental Committee
Escom	Electricity Supply Company
EWG	Electricity Working Group
FDI	foreign direct investment
GEAR	Growth Employment and Redistribution
GW	Gigawatts
GWh	Gigawatt hours
IEP	Integrated Energy Plan
IPAP	Industrial Policy Action Plan
IPAP2	Industrial Policy Action Plan 2010/11-2012/13
IPP	Independent Power Producer
IRP2010	Integrated Resource Plan 2010-2030
ISMO	Independent System and Market Operator
JSE	Johannesburg Stock Exchange
LPG	Liquid Petroleum Gas
MEC	Minerals-energy complex
NELF	National Electrification Forum
NER	National Electricity Regulator
NERSA	National Energy Regulator of South Africa
NGO	Non-governmental Association
Niasa	Nuclear Industry Association of South Africa
NIPF	National Industrial Policy Framework
OCGT	Open Cycle Gas Turbines
RDP	Reconstruction and Development Programme
RED	Regional Electricity Distributor
REFIT	Renewable Energy Feed In Tariff
SACC	South African Council of Churches
SACP	South African Communist Party
SAFCEI	Southern African Faith Communities Environment Institute
SANEDI	South African National Energy Development Institute

SANERI	South African National Energy Research Institute
UCT	University of Cape Town
VFTPC	Victoria Falls and Transvaal Power Company

Chapter 1

Introduction and overview

In 1994, after South Africa's transition to democracy, the ANC government embarked on an ambitious program of electricity industry reform. The new government needed to deliver affordable electricity to all of its constituents who were neglected by the apartheid regime.[1] In order to do this policy-makers saw the need not only make new connections but also to reform distribution and production of electricity as well as introduce an electricity regulator to standardise and set electricity tariffs.[2]

Despite the success of the government's mass electrification programme (it made over 3 million new connections in six years)[3] and the establishment of the National Electricity Regulator in 1995 (which became the National Energy Regulator of South Africa in 2002), reform of the electricity production and distribution sector has not progressed significantly from 1994, despite the development and adoption of a model for the restructuring of the electricity supply industry in 2003 (this was postponed in 2004).[4]

However, South Africa's democratic transition has put new strains on the energy industry. Economic growth and the ANC's mass electrification programme have increased demand for electricity above capacity. This has put South African electricity supply in crisis. Still, state owned Eskom remains the only significant electricity supplier,[5] providing 98% of the country's electricity, generating 92% of this by burning South Africa's cheap and abundant supply of low grade coal.

---

1 Eberhard, A (2007) The political economy of power sector reform in South Africa in Heller, T and Victor, D (eds) *The Political Economy of Power Sector Reform,* Cambridge University Press, Cambridge. Pp 230

2 Marquard, A (2006) *Origins* and Development of South African Energy Policy. Unpublished PhD Thesis, UCT. Pp 183-184

3 Eberhard, A (2007) pp239

4 Marquard, A (2006), pp 187

5 Eberhard, A (2007) pp 230-235

This means South Africa's electricity, while still cheap, is some of the dirtiest and least sustainable in the world.[6,7,8] Eskom no longer has the ability to create new capacity and maintain cheap prices and the Treasury does not have the reserves to provide finance for new power generation infrastructure. Increases in South Africa's generation capacity are therefore dependent either on private investment or debt.[9] South Africa's electricity supply industry is in desperate need of reform in order to increase capacity and ensure sustainability.

However, South Africa's traditional economic strengths have been its energy intensive mining and related manufacturing sectors.[10] These industries depend on high energy inputs and in South Africa they have become dependent on the provision of cheap electricity. This occurred due to the industries' adaptation to low electricity prices in the 1980s derived from Eskom's over capitalisation and consequent excess capacity and cheap coal as fuel. The result is that mining and manufacturing industries have adopted methods that are electricity intensive and their competitiveness derives from electricity as a cheap input.[11] These industries and other groups interested in their success (such as the government, mining and metalworkers' unions) are therefore dedicated to ensuring the maintenance of a cheap supply of electricity. This reliance on cheap sources of electricity implies a preference for coal over other more expensive energy sources, ensuring the protection of Eskom as the producer of electricity and protecting industry from a rise in prices through private production.

Eskom itself is unwilling to cede control of electricity production or transmission into private hands, squashing attempts to introduce competition into the market. It does this by refusing to sign

---

6 Bond, P and Hallowes, D (2002) The Environment of Apartheid Capitalism in Bond, P, *Unsustainable South Africa, Environment, Development and Social Protest.* University of Natal Press, Pietermaritzburg, pp 37.

7 Marquard, A (2006) pp 122

8 The government has recently been forced to halve its coal reserve figure due to updated calculations, suggesting South Africa may have hit the peak coal barrier. http://www.miningreview.com/Concern/over/accuracy/SA/coal/reserves

9 Eberhard, A (2007) pp 223

10 Fine, B and Rustomjee, Z (1996) *The Political Economy of South Africa: From Minerals-Energy Complex to Industrialisation.* Witswatersrand University Press, Johannesburg. Pp 71.

11 Ibid pp108-111

long-term power purchasing agreements that would entice private firms to enter the market and by refusing to relinquish control of either the power production or transmission industries, either of which could provide the incentive for private firms to enter the market.[12]

Reform of the distribution industry has also stalled as local authorities, who derive significant revenues from electricity distribution, and the Treasury, who would like to see this continue, resist the transfer of this responsibility to proposed regional electricity distributors.[13]

The ANC, the main driver of reform in the electricity sector, has achieved its two primary goals for the electricity industry: the mass electrification of households to redress the racial imbalance in access to electricity created by apartheid and the creation of an electricity regulator (originally the National Electricity Regulator or NER, now the National Energy Regulator of South Africa or NERSA) to standardise and set electricity tariffs across the country.[14] Subsequent to these successes, the political will to further reform the electricity industry has dissipated.[15]

The purpose of this thesis, therefore, is to examine and explain the policy making arrangements and describe how reform has been resisted in the South African electricity supply industry between 1994 and 2011, preventing the introduction of private players into the electricity supply industry and the adoption of sustainable electricity systems.

The history and political economy of South Africa's electricity sector

The political economy of South Africa's electricity sector is best understood through the history of

[12] Greenberg, S (2008) Market liberalisation and continental expansion: The repositioning of Eskom in post apartheid South Africa in McDonald, D (ed) *Electric Capitalism: Recolonising Africa on the power grid.* HSRC Press, Cape Town. Pp 77-82

[13] Marquard, A (2006) pp 187

[14] ANC (1994) Chapter 2, *The Reconstruction and Development Programme: a policy framework.* Umanyano Publications, Johannesburg. Pp 31-34.

[15] Eberhard, A (2007) pp 216

the development of the sector, its linkages to mining and manufacturing sectors and politics pre-, during and post-apartheid. It is also important to understand the political economy of South Africa's electricity sector in order to understand the development and power of its policy regimes.

Electricity was first generated in South Africa by private companies as a resource for energy intensive gold mining. The nature of gold deposits in South Africa meant that their extraction was (and still is) both labour and energy intensive.[16] Local authorities followed suit, beginning to establish small electricity systems to supply cities. The government established the Electricity Supply Commission (Escom, later Eskom) in 1922 to take over the responsibilities of supply to local authorities and to establish generation and distribution capacity for the lowest cost possible. Escom was mandated as (and continued to view itself as) a progressive driver of electricity and the expansion of its supply as a means of progress. [17]

Up until the late 1940s, when it was expropriated by the government, the principle electricity producer for mining operation was the Victoria Falls and Transvaal Power Company (VFTPC). It was the VFTPC's ability to produce electricity cheaper than the mines, through economies of scale and using the latest technologies, that established the monopoly character of the South Africa's electricity industry.[18] The VFTPC, along with Escom, established coal as the primary resource for electricity in the country following its discovery in close proximity to the gold deposits and by 1930 were producing electricity as cheaply as it was being produced anywhere else in the world. The expropriation of the VFTPC was motivated by the advantage of further economies of scale in the electricity sector, the need for capital to ensure the requisite investment to develop the sector, and justified by the state-owned enterprise's ability to produce electricity at cost. Government

---

16 Marquard, A (2006) pp67-69

17 Ibid, pp 126-128

18 Conradie, S and Messerschmidt, L (2000) *A Symphony of Power:The Eskom Story*. Chris Van Rensburg Publications (Pty) ltd, Johannesburg. Pp 29-30

guarantees could ensure the capital was available.[19]

The establishment of Escom -- and its subsequent takeover of the VFTPC through the Electricity Control Board (the electricity oversight body established along with Escom in 1922) withholding renewals of licenses after Escom said it could provide the electricity more cheaply -- gave state ownership to the electricity monopoly and laid the foundation for the rise of what Fine and Rustomjee have called the minerals-energy complex (MEC).[20] This began as the interdependence of gold mining, coal mining and state run electricity. The complexity of this relationship increased over time with the introduction of the other mining and manufacturing industries aimed at the benefitiation of mining products, such as the iron and steel industry, (including the state owned Iscor) the petrochemicals industry (through the state run Sasol) through the late 1950s, 1960s and the early 1970s. The introduction of these industries formed part of the apartheid government's pursuit of industrialisation. The manufacturing industries included iron and steel benefitiation, smelting, the production of base metals and other chemicals, many needed for mining processes, and the petrochemicals industry, dominated by Sasol's production of crude oil from coal through the Fischer-Tropsch process. They are particularly electricity intensive industries and dependent on cheap electricity for profitability.[21] New power stations were constructed close to the privately owned coal mines and by the 1980s Escom had capacity in excess of 10000 MW. Additionally, Escom at that time had new capacity in planning and construction of over 22000 MW, funded through local and international government bonds, in response to rapid demand growth as the country substituted oil with electricity in response to the oil shocks and embargoes of the 1970s.[22]

During this period of state led industrialisation, ownership in the MEC was shared between private enterprise and the state. Private enterprise dominated mine ownership and the financial sector

19 Eberhard, A (2007) pp218-219
20 Fine, B and Rustomjee, Z (1996)
21 Ibid, pp71-91
22 Eberhard, A (2007) pp219

(which grew increasingly complicated as international isolation tightened) with some interests in the manufacturing sector. The state owned the electricity industry and other mining support industries such as the railways and ports. The state also drove the development of the manufacturing industry, owning significant parts of it. The private sector developed into a small number of large conglomerates as isolation limited opportunities for investment internationally. Holding companies owned mines and separate manufacturing firms that consumed the raw materials that their mines produced. Thus, there were extremely high levels of concentration of ownership on the Johannesburg Stock Exchange leading up to 1994 and the post-apartheid era.[23]

The MEC was (and largely still is) the backbone of the South African economy. Fine and Rustomjee showed in 1996 that the combination of the mining sector, the mining related manufacturing sector, the petrochemicals sector and the electricity sector accounted for as much as 27,5% of GDP in the late 1980s, by separating out MEC related manufacturing from other manufacturing in the economy.[24] The argument for understanding the MEC as a single block is a strong one, demonstrated through the forward and backwards linkages in between its various sectors: over 90% of the coal it produces is consumed within the MEC, over 40% of electricity produced and over 20% of the MEC's output forming almost 60% of its inputs.[25] Viewing the MEC as a single block also partly explains South Africa's specific dependence on electricity and the reason Escom has been granted significant independence in the formulation of electricity policy with respect to generation capacity, transmission and finding effective ways to meet demand cheaply.

The regulation and oversight of the South African electricity industry had been weak with respect to the state owned Escom.[26] When Escom was established in 1922, the government established the Electricity Control Board (ECB) as an industry oversight body and regulator. The ECB was

---

23 Fine, B and Rustomjee, Z (1996) pp 98-103
24 Ibid, pp 81
25 Ibid, pp 81-85
26 Marquard, A (2006), pp 129-133

responsible for licensing generation and approving the tariffs charged by electricity suppliers. It reinforced the government's preference for a state run electricity monopoly (as demonstrated by its refusal to reissue the VFTPC with licenses, leading to its takeover by Escom) and by refusing private players' licenses if Escom could beat their tariff. Beyond this, the ECB had little influence, having only 5 members and 2 staff.[27] In 1985 the De Villiers Commission investigation into the governance of Escom resulted in its restructuring into Eskom. In 1987 the ECB was supplanted by the Electricity Council (EC), made up of ministerially appointed councillors representing major consumers, relegating the ECB to the role of regulator of private producers with Eskom no longer requiring licensing by law. The Electricity Council performed the role of government liaison: negotiating Eskom-sought price increases to fund investment in new infrastructure to acceptable levels for consumers, subject to approval by the minister. This arrangement persisted until the ECB was replaced by the National Electricity Regulator (NER) in 1995. The NER emerged out of the politically inclusive National Electricity Forum (NEF) which negotiated electricity issues through South Africa's political transition. The NER took responsibility for all licensing of electricity generation, transmission and distribution, which once again included Eskom operations. It was also mandated with regulation and rationalisation of tariffs to local authorities and wholesale consumers, and as an oversight body. These functions were incorporated into NERSA in 2002. [28]

At a national departmental level oversight and regulation has also been very limited. Escom came initially under the purview of the Department of Mines and Industry, then the Department of Commerce and Industry in the 1930s before moving to the Department of Industry in the 1960s and then briefly to the Department of Mineral and Energy Affairs in 1980. At the end of that decade it was moved to the new Office of Public Enterprises, which became a full ministry in 1994. The Department of Public Enterprises has been Eskom's principle shareholder since 1994, but Eskom has been accountable to the Department of Mineral and Energy Affairs (now the Department of

[27] Ibid, pp 133
[28] Ibid, pp 134

Energy). According to Marquard,[29] none of these departments had capacity to oversee electricity policy until the late 1990s. This left Eskom mostly free to make electricity policy and supply decisions throughout its existence.

Subsequent to South Africa's 1994 democratisation, the landscape of South Africa's political economy has changed substantially. The gradual liberalisation of capital controls has meant South African conglomerates have largely unbundled and sought investment overseas with outgoing foreign direct investment (FDI) greater than the much hoped for incoming FDI.[30] Macroeconomic policy has been designed to incorporate World Bank structural adjustment programmes along with prudent fiscal and monetary policy.[31] The immediate post-apartheid government prioritised the repayment of the country's debts built up during the economy's stagnation of the eighties, leaving little funding available for infrastructure development.

Once in power, the ANC tempered its tendency towards socialism, implementing first the Reconstruction and Development Programme in 1994. This committed the new government to redistribution while enshrining Washington Consensus property rights and respect for structural adjustment. However, the ANC government became increasingly neo-liberal from 1996, under the influence of Vice-President Thabo Mbeki, implementing the Growth, Employment and Redistribution Plan (GEAR). This prioritised growth over redistribution by aiming to reduce the budget deficit, control inflation, lower trade barriers and stabilise the currency.[32] These policies have been coupled with some privatization of the apartheid born state industries (some successful, some not), with an apparent intention to privatize more, despite opposition from the ANC's socialist allies the Congress of South African Trade Unions (Cosatu) and the South African Communist

---

[29] Ibid, pp 143-156

[30] Fine, B (2008) *The Minerals-Energy Complex is Dead: Long Live the MEC* Amandla! Colloquium, pp2-5. http://eprints.soas.ac.uk/5617/ [accessed 01/07/2011]

[31] Habib, A and Padayachee, V (2000) Economic Policy and Power Relations in South Africa's Transition to Democracy in *World Development* 28, 2. pp 245-253.

[32] Handley, A (2005) Business, government and economic policymaking in the new South Africa, 1990-2000 in *Journal of Modern African Studies* 43, 2. pp 225-228

Party. Legislation has been passed to encourage black ownership in the economy. Despite these efforts, economic growth has been moderate -- hovering around the 3% for most of the period between 1994 and 2010 -- and foreign investment low, recruitment of which has been a major justification for the creeping neo-liberalism.[33] The subsequent introduction of the Accelerated and Shared Growth Initiative in 2005 continued along in this vane, although it gradually expanded social and infrastructure spending as the benefits of the reduced budget deficit were felt, and began to examine the use of industrial policy to increase the growth rate.[34]

More recently the government has decided to use industrial policy as a means of encouraging economic growth. In 2007, the government released its National Industrial Policy Framework (NIPF), which, through thirteen strategic programmes, aims at creating skills and jobs to deepen South Africa's industrialisation. It identifies the need to stem job losses in South Africa's commodities sectors, agriculture and particularly mining, and proposes the pursuit of further value addition through labour absorbing manufacturing including the beneficiation of minerals, thus deepening the electricity intensive manufacturing sector.[35] The framework also emphasizes the importance of maintaining cheap electricity.[36] The framework fails to address the energy implications of its goals, the additional requirements for deepening mineral manufacturing and how this will be addressed despite the economy already beginning to experience electricity shortfalls as of 2005/2006. The NIPF was followed by the Industrial Policy Action Plan (IPAP) in late 2007 which set out the details and time frames of for NIPF's Key Action Plans. The IPAP identified four lead sectors for support and intervention: 1) equipment and metals, 2) automotive assembly and components, 3) chemical and plastic fabrication and pharmaceuticals and 4) forestry, pulp, paper

[33] Marais, H (2011) *South Africa pushed to the limit: The political economy of change.* UCT Press, Cape Town. Pp 1481-49

[34] Ibid, pp 1481-49

[35] The Department of Trade and Industry (2007) A National Industrial Policy Framework pp 9

[36] Ibid, pp 15

and furniture.[37] The IPAP further deepens the NIPF's commitment to energy intensive manufacturing without addressing the energy and electricity implications of these choices. The plan does note the potential for a South African biofuels industry, but fails to address demand side energy and electricity concerns. The IPAP was followed in 2010 by the Industrial Policy Action Plan 2010/11-2012/13, known as the IPAP2. The IPAP2 addresses industrial opportunities in response to the global recession, going deeper than the immediate interventions of the IPAP1. It addresses industrial finance, tariff and trade policy and competition policy as well as identifying areas for support and development. It identifies the same areas as the IPAP1 but adds others, including tourism, business process outsourcing and green and energy saving industries. In terms of green and energy saving industries, the IPAP2 proposes changing building regulations and standards to ensure markets for local producers of energy saving products. It is primarily focussed on the potential of solar water heating as well as the potential of the solar power and wind industries.[38] The plan, however, again fails to address the additional demand on the energy sector it will place, despite the experience of supply shortage. The plan also fails to address improved industry efficiency in a meaningful way, only acknowledging the need for it without detailing how this would be accomplished, then simply treating it as an area for potential new industrial growth.

The most immediate effect of the transition to democracy on the electricity sector was the political imperative to equalise distribution to domestic users. Apartheid gave preference to white urban consumers of electricity over black peri-urban and rural users, leaving the latter without connections or basic electricity infrastructure. Local municipalities were the primary distributors of electricity to urban users, but Eskom agreed to take on much of the responsibility for making and distributing to new connections post 1994. Eskom has been fairly successful in terms of making connections, despite increasing restriction on the amount of government funding available.

---

[37] The Department of Trade and Industry (2007) Implementation of Government's National Industrial Policy Framework: Industrial Policy Action Plan. Pp 5

[38] Department of Trade and Industry (2010) 2010/2011-2012-2013 Industrial Policy Action Plan. Pp41-45

The second affect of the democratic transition and the subsequent fiscal restrictions of the new government's economic realities on the electricity industry was the increased pressure on state owned enterprises to run efficiently.[39] This led to a restructuring of the oversight and management structure of Eskom, which will be discussed in more detail in the next section.

Up to the early 2000s it appeared that Eskom was performing well compared to other state owned enterprises; it provided amongst the world's cheapest electricity at a profit and with high labour productivity. However, this picture was misleading, as Eskom commissioned excessive supply in the 1980s and was able to maintain cheap supply only because it had no need to invest in new supply infrastructure, having paid off all existing supply infrastructure. It was able to supply electricity at marginal cost or below and still maintain a profit.[40] By 2006, following several years of good economic growth, demand began to exceed supply and Eskom began rolling blackouts at peak demand times in the year or during power station maintenance schedules.

Despite deciding to reopen several coal power stations previously 'mothballed' as a result of overcapitalisation, Eskom has been forced to commission new power stations to be financed through debt and increased electricity tariffs. NERSA has agreed to around 24% increases in tariffs each year for three years from 2010,[41] the World Bank granted Eskom a loan of $3.75 million to fund the construction of two new coal-fired power plants,[42] and the African Development Bank agreed to a $2.77 billion loan as a contribution to one of the two plants. Effectively, this ties South Africa into servicing long-term debt for two new power stations decided upon through old fashioned planning methods which deepen the country's dependence on coal powered electricity.

---

39 Eberhard, A (2007) pp 231

40 Ibid, pp 232

41 NERSA, Reason for Decision: Eskom Holdings Limited: Revenue Application – Multi Year Price Determination 2010/11 to 2012/13 (MYPD2) available at http://www.nersa.org.za/ [accessed 15/07/2011]

42 MacNamara, W (2010) Big push to make sure the power stays on in *Financial Times* April 2010 pp3

The structure of South Africa's electricity supply industry

South Africa's electricity industry structure is dominated by Eskom. The industry can be divided into three distinct areas: 1) production, 2) transmission and 3) distribution. Eskom functions in all three areas, producing over 98% of the country's electricity. It controls the electricity grid, and therefore maintains sole responsibility for buying electricity from independent power producers as well as providing distributors with supply. Distribution is handled by local municipalities in most of the country's established urban areas, with Eskom distributing directly to many of the rural and peri-urban areas connected to the grid after 1994. Eskom is also responsible for the direct distribution to its largest consumers, members of the minerals-energy complex as well as other large agricultural users.

Since 1994 there have been several attempts to alter this structure, to update the management of electricity supply in the country and allow for some privatisation of the industry in line with GEAR.[43] These attempts have been most effective at the regulatory level, with the introduction of the NER and NERSA, but have failed in their attempts to change the structure of the industry. The National Electrification Forum (NELF), established to oversee the transformation of the electricity industry through the country's political transition, began preparing for the rationalisation of the electricity distribution industry prior to its disbandment in 1995. Its efforts were continued by the NER, which convened an Electricity Working Group (EWG) made up of government, municipalities, Eskom and the NER. The working group proposed to the Electricity Restructuring Interdepartmental Committee (ERIC), whose role was to make recommendations to Cabinet, that the distribution of electricity be divided under several independent Regional Electricity Distributors (REDs), with the rationalisation process to be managed by publicly owned Electricity Distribution

[43] Eberhard, A (2007) pp 231-235

Company. Cabinet agreed to this, deciding that there should be six REDs, and in 2000 appointed a PricewaterhouseCoopers led consortium to propose a model for the development of the REDs. This was overseen by the Electricity Distribution Industry Restructuring Committee, made up of Eskom, national and local government, which developed a blueprint for the process that was accepted by cabinet in 2001.[44] However, despite the establishment of the EDI Holdings company and the registration of one RED, Cabinet in 2010, decided to shut down the distribution rationalisation process.[45]

The Department of Public Enterprises, in its effort to restructure state owned enterprises, began in 2000 the process of corporatising Eskom. This was formalised in the Eskom Conversion Act of 2001, which normalised Eskom's status as a company, outlining shareholding arrangements, despite maintaining public ownership, and tax responsibilities. The Act outlined the path to ringfence the transmission of electricity from its production, removing Eskom dominance over both the production of electricity and control of the national grid, which sources supply, establishing distinct companies to oversee each.[46] This would allow independent power producers access to the market without depending on their main rival, Eskom, to buy their electricity. While the initial corporatisation of Eskom was legislated in 2001, the legislation to ringfence transmission and establish an independent system and market operator is still in the draft phases. The latter legislation has been the focus of resistance from the government's labour allies.

Research question

My research therefore seeks to answer: What is the nature of South Africa's electricity policy regime and how does it act as a barrier to reform and the introduction of sustainable energy sources

---

[44] Ibid, pp 231-235

[45] Consulting Engineers South Africa (2010) *Termination of the Electricity Distribution Industry.* Available at http://www.cesa.co.za/node/117 [accessed 15/07/2011].

[46] Eberharrd, A (2007) pp244-245

into the South Africa's energy system from 1994 to 2011?

The hypothesis is that the presence of an influential policy regime -- closely associated with the Minerals-Energy Complex and Eskom -- acts as a barrier to the necessary shift in policy paradigms that would lead to reform of South Africa's energy and electricity sector and increase its sustainability. This regime amounts to an informal coalition between Government, across several levels and departments, Eskom and energy intensive industry. I expect to find that this regime uses both overt and covert influences, financial power, information and skills asymmetries, a broad support base of investor and labour interests, and public pressure for cheap electricity to reinforce the energy and electricity policies. The regime subscribes to a policy paradigm that pursues measures to expand energy supply cheaply to meet growing demand, without regard to demand-side efficiency, resource availability and sustainability. This regime is supported by the government's neo-liberal approach to economic development and consistently overpowers competing regimes and paradigms that, while vocal in public hearings, lack broad-based or institutional support, capacity and financial power.

Research Design

This study is a desktop examination of public documents from public participations in the policy process. This study draws on the methods employed by Gila Menahem in her studies of Israeli water[47] and education[48] policy regimes and by Peter May and Ashley Jochim's[49] in scrutinising homeland security policy regimes in the United States. This study looks primarily at documentation from public participation processes in the development of policy. This documentation is in the form

[47] Menahem, G (1998) Policy Paradigms, Policy Networks and Water Policy in Israel in *Journal of Public Policy* 18, 3. pp 283-310

[48] Menahem, G (2008) The Transformation of Higher education in Israel since the 1990s: The Role of Ideas and Policy Paradigms in *Governance: An International Journal of Policy, Administration and Institutions* 21, 4. pp 499-526.

[49] May, P, Jochim, A and Sapotichne, J (2009) Policy Regimes and Governance: Constructing Homeland Security. Paper prepared for 10th public Management Research Association Conference, Ohio State University, October 2009.

of public submissions from public parliamentary hearings for specific energy and electricity policies. One aim of this analysis is to establish who is participating in the South African energy policy process, into what paradigms their propositions fall, and the extent to which these propositions can be traced in the final policy documents. In addition, the study will trace the extent of the implementation of the policies to trace the influence of regimes beyond the public participation process. This will establish the ability of competing regimes to influence the policy process in the electricity sector, indicating the relative strength of the policy regimes over the South African electricity industry.

Chapter 2

Policy Regime Theory

Background to Policy Regime Theory

Literature on how policy is made and changed has rapidly developed since the 1950s with the current emphasis resting on the importance of policy networks deciding which policy solutions are chosen for identified problems. Although the literature to some extent agrees that policy is decided by groups of actors representing different interests, there is relatively little consensus around how this happens. Most of the theory does not manage to encompass all the aspects of policy making and policy change in its models and frameworks.[50]

The literature is largely developed in the United States and the United Kingdom and is therefore primarily designed to understand the policy process in these countries, but many of these studies can be useful for understanding the policy process in other similarly designed constitutional democracies.

Policy is usefully described as a "web of decisions."[51] Decisions relate to each other as both part of a succession of policies and a structure of policies whereby they are linked and built on one another. The idea of this decision web is useful in that it acknowledges that the policy process is not as rational as sometimes thought and described by the stages model. Most contemporary authors reject the idea that the policy process is a linear progression of identifying problems and building solutions to fit the problems,[52] but more likely the result of sets of ideologies and interests attaching their solutions to problems as they come along.[53]

---

50 Wilson, C. A (2000) Policy Regimes and Policy Change in *Journal of Public Policy* 20, 3, pp 247-274.

51 Ham, C and Hill, M (1984) *The Policy Process in the Modern Capitalist State.* St Martin's Press, New York.

52 See: Wilson, Cohen, March and Olson, Kingdon, Smith. etc

53 Kingdon, J (1995) *Agendas, Alternatives and Public Policies.* HarperCollins College Publishers, New York, pp 173.

The theory of a policy network emerges out of the idea of policy subsystems, which describes the enduring relationships between state actors and interested parties in the policy sphere. This is first described with the development of the idea of the "iron triangle" in Unites States politics, where it is argued that congressional committees, bureaucracy and interest groups form the three nodes of a triangle that determines policy in the US.[54] These triangles were specific to specific policy areas such as transport or agriculture and excluded other potential participants from the policy process such as the executive and outside interest groups or interested constituencies. A similar idea of policy communities developed in the UK, which described the ongoing relationships between state agencies and interest groups. These theories were generalised to become the theory of policy networks, where participants in policy networks have enhanced possibilities to influence policy-making. This has become the dominant approach to the study of policy-making.[55]

Policy network scholars are divided as to the actors, membership and nature of these groups. Some scholars such as Kingdon[56] argue that networks are made up of individuals or groups which are either experts in a given policy area or regular participants in the policy-making process. Others, such as Rhodes, Marsh and Smith argue that it is groups that are significant, either interest groups or state agencies. Smith argues that these groups are held together by mutual resource dependencies, making policy interactions strategic. Sabatier alternatively outlines a theory of advocacy coalitions, which compete for influence on policy-makers. These coalitions are made up of people from various belief systems who share the same policy beliefs.[57] The criteria for membership of a coalition, beyond sharing belief systems, are sharing knowledge and developing strategies cooperatively to increase capacity to influence policy.

---

[54] Jordan, A.G (1981) Iron Triangles, Woolly Corporatism and Elastic Nets: Images of the Policy Process in *Journal of Public Policy* 1, 1, pp 96.

[55] Konig, T (1998) Introduction: Modeling Policy Networks in the *Journal of Theoretical Politics*, 10, 4. pp 387

[56] Kingdon, J (1995)

[57] Sabatier, P (1988) An Advocacy Coalition Framework of Policy Change and the Role of Policy-Oriented Learning Therein in *Policy Sciences* 21, 2/3, pp 129-168.

Policy retains an inherent structure that has been variously defined and is important to note in the South African context. This structure is defined as a policy framework, which can be seen either as a meta-policy (if used in a weak sense), policy ideology, or policy paradigms (if used in a strong sense).[58] Following the work of Peter Hall this paper will use the term policy paradigm.[59] Sabatier[60] makes the distinction between "Deep Core Beliefs", "Near Core Beliefs" and "Secondary Beliefs". Deep core beliefs are the fundamental normative principles of policy elites such as economic liberalism; near core beliefs are the primary policy positions taken as result of deep core beliefs such as preference of the market over the state; secondary beliefs form the instrumental decisions based in on the deep and near core, such as no minimum wage. Change, therefore, can happen at several levels of policy with varying degrees of difficulty. Change in an instrumental policy only needs a change in secondary belief (or for a policy maker to cede ground in an area of policy). This is a relatively minor change and does not necessitate the change of fundamental beliefs. Continuing the example provided above, this would mean accepting a minimum wage. However, minimum wage is a relatively minor state intervention, and does not mean that in general a policy maker prefers state intervention in the market. A change in a primary policy position, ceding to a significant level of state intervention in the economy, for instance, necessitates a change in near core beliefs and even deep core beliefs of policy makers, this is much harder to achieve. If deep core beliefs are what inform policy frameworks then it follows that policy frameworks are much harder to change and much more stable than individual policies.

Explaining policy change has been a focus of the public policy discipline in recent years and

---

58 Marquard, A (2006) pp 14.

59 Hall, P (1993) Policy Paradigms, Social Learning, and the State: The Case of Economic Policy making in Britain in *Comparative Politics* 25, 3 pp 275-296.

60 Sabatier, P (1988)

there is little consensus in the literature on this issue.[61] Wilson identifies four major strands in the literature which explain policy change: 1) policy process and decision making, 2) elitists and neo-Marxists, 3) post-modern and culture and 4) state-centric. He argues that none or few of these adequately cover the multiple dimensions of the policy change process and tend to focus specific elements.[62]

Policy network explanations of policy change fall into the first of these schools. They argue that change in policy is a function of alterations of power arrangements in policy networks such as the decline of an interest group and the rise of another or changing political coalitions.[63] Within this school there are a number of ideas about how policy change takes place. Some, such as Cobb and Elder,[64] argue that change is instigated by events which place issues on the policy agenda as problems and how 'policy entrepreneurs' push through their own solutions in the form of policy changes. Others, such as Kingdon, argue that it is a combination of timing and manipulation that allows these entrepreneurs to match their solutions to policy problems, citing the example of the public transport lobby promoting their interests in response to multiple issues such as clean air and urban congestion.[65]

Further, True, Baumgartner and Jones developed the idea of a punctuated equilibrium, which characterises public policy as experiencing long periods of stability with short moments of change and attempts to explain both this stability and change.[66] The theory is based on political institutions and bounded rational decision making, while focussing on issue definition and

---

61 Wilson, C. A (2000) pp247.
62 Ibid, pp 248
63 Ibid, pp248
64 Cobb, R and Elder, C (1983) *Participation in American politics: the Dynamics of Agenda Building*. John Hopkins University Press, Baltimore.
65 Kingdon, J (1995), pp 173-174
66 True, J. L, Baumgartner, F, Jones, B (2007) Puntuated-Equilibrium Theory: Explaining Stability and Change in Public Policymaking in Sabatier, P (ed) *Theories of the Policy Process,* Westview Press, Colorado, pp 155.

agenda setting.[67] For them, issues rise and fall in the public discourse and policy is either changed or reinforced by this rise and fall of issues on the agenda. The theory rejects both incrementalism and global rationality, arguing that neither explains the observation that policy tends to change suddenly.[68] By including limited attention span in government, sudden change makes sense, as described by bounded rationality and fluctuations on the issue. Changes then occur through the political institutions and multilevel decision making. However, this theory is limited to accurately describing policy change at the system's level and not specific policies. [69]

Sabatier and Jenkins-Smith's advocacy coalition framework, rather, is targeted at understanding policy problems when goals conflict, which result in technical disputes with multiple players from multiple levels of government.[70] The theory is based on three assumptions:

1) at the macro-level: factors in the broader socioeconomic and political system influence the behaviour of specialists in policy subsystem,

2) at the micro-level: the individual can be understood though social psychology and

3) at the intermediate level: these can be aggregated into 'coalition networks'.

The dependent variables therefore are belief and policy change, which occur through (internal) policy-oriented learning and external changes.[71]

Advocacy Coalition Framework theory (ACF) argues that subsystems are made up of both individuals and groups, and emphasize the role of researchers in informing policy position in subsystems. The Advocacy Coalition Framework theory differs significantly from punctuated equilibrium theory in its conception of how decisions are made. Instead of using rationality as

---

67 Ibid, pp 156.
68 Ibid, pp 156
69 Ibid, pp 179
70 Sabatier, P and Wielder, C (2007) The Advocacy Coalition Framework: Innovations and Clarifications in Sabatier, P (ed) *Theories of the Policy Process,* Westview Press, Colorado, pp 189.
71 Ibid, pp192

its basis, ACF argues that beliefs systems have a greater influence on which choices are made, suggesting 'a logic of appropriateness' and 'a logic of consequences' to understand positions is more appropriate.[72] This is based on the assumption of the difficulty of changing normative beliefs. This also informs how actors view their opponents.[73]

ACF offers a powerful tool for explaining policy change, particularly at the policy level. Its emphasis on belief systems however makes it significantly more difficult for the theory to explain abrupt changes of policy frameworks.

Policy Regime Theory

Policy regime theories of policy change attempt to offer a synthesis of the study of most of the aforementioned schools of thought, but with particular emphasis on punctuated equilibrium theories and ACF. Wilson develops a model drawing on regime theory in the international and regulatory regime theory from the pluralist paradigm in international relations.[74] He suggests policy regimes form around specific issues, not belief systems. He accounts for belief systems in terms of what influences policy, arguing that policy regimes consist of four dimensions. The first of these is its power arrangements, the second is the policy paradigm, which incorporates beliefs and defines the way policy problems are understood and it comes from the actors involved in the policy regime. The third is organisation within government and the fourth is the policy itself.[75]

Power arrangements, according to Wilson, are organised such that regimes are supported by a selection of powerful interest groups. These may be individual groups or a coalition of interest

72 Ibid, pp 194.
73 Ibid, pp 194.
74 Wilson, C (2000) pp 257
75 Ibid, pp 258

groups benefiting from the policy. The source of the power of these interest groups to support a particular regime could come from number of sources: financial power, a broad support base, weak opposition, state support or participation, or a business-friendly state. [76]

Wilson describes the policy paradigm as the lens through which a policy problem and its solution are defined, incorporating assumptions about the causes of the policy problem, how serious it is, who is responsible for creating the problem, who is responsible for solving it and what the government's role in this process should be.[77] It also takes into account the population affected by the policy. Wilson argues that the policy paradigm is established by intellectuals and researchers who build the discourse around policy problem, professionals who work with the policy problem, interest and pressure groups promoting a particular agenda and policy makers who interact with these players.[78]

The organisation within government is the third dimension of the policy regime. This refers to the structure of the government, its departments and decision making bodies, including parliamentary committees, and implementing bodies such as government agencies.[79]

Regime change is instigated by stressors and enablers, normally represented by an external shock to the system, such as the fall of the Soviet Union. As a consequence of this shock, the policy regime will experience paradigm shifts, power shifts, a legitimacy crisis and organisational and policy change.[80]

Stressors and enablers create the conditions necessary for change in the policy regime. They

---

76 Ibid, pp 257
77 Ibid, pp 257
78 Ibid, pp 258
79 Ibid, pp 251
80 Ibid, pp 262

stress organisational structures, highlight problems in policy regimes, create change in the power arrangements of promoters of various policy agendas and swell the numbers of those disaffected by problems in policy. Wilson draws on Cobb and Elder's understanding of "trigger events", Sabatier's "external perturbations" and Jones' "external events". These events can be any event with consequences relevant to the policy issue, from international politics, to natural and human disasters, gradual demographic changes, political change, public scandal, economic crises and resource shortages.[81] Stressors and enablers create the possibility for paradigm shifts, normally through increasing awareness of an issue, changing popular perceptions, which creates the need for regimes to change these paradigms. Examples include the change in paradigm of tobacco policy regimes, and how inflation and shifts in unemployment can affect economic policy regimes.[82]

These paradigm shifts occur when stressors and enablers create conditions that undermine the dominant paradigm. Alternative paradigms often exist as alternatives or in direct opposition to the dominant paradigm, becoming the successors to the dominant paradigm when stressors and enablers undermine the dominant paradigm's credibility.[83] Wilson argues that the changes in smoking and racial segregation regimes are examples of this.[84] Peter Hall further establishes this process in his discussion of the shift to monetarist over Keynesian macroeconomic policy with the election of Margaret Thatcher's government.[85]

Wilson argues that a paradigm shift amounts to the persuasion by intellectuals of other intellectuals that an alternative paradigm is valid and the subsequent popularisation of the new paradigm by political leaders.[86]

---

81 Ibid, pp 261
82 Ibid, pp 261
83 Ibid, pp 262
84 Ibid, pp 263
85 Hall, P (1993) pp 275-296
86 Wilson, C (2001) pp 263

If the change of paradigm results in a crisis of legitimacy for the established policy regime, the result is the potential for regime change. This occurs through the popular abandonment of the old regime and the exploitation, by political leaders, of the paradigm shift to create a new regime. Political leaders make attacks on the rationality of the current regime and promote the alternative using the media, removing the issue from the traditional policy arena to wider audiences.[87]

With the loss of legitimacy in public perception, policy regimes experience power shifts. These shifts occur through defection, the collapsing of coalitions, the formation and dissolution of organisations and the formation and dissolution of sources of power (here, power can be financial or defined in terms of support base, or leadership changes in the state). For regime change to occur, the power shifts need to create power bases with the capacity to make organisational changes and change to policy implementation.[88]

These changes in organisation and policy implementation constitute the final stage of policy regime change. The reorganisation of the policy process is the culmination of change in policy goals, paradigms and power arrangements and these changes can result in four types of regime change: 1) dissolution and recreation of a regime, 2) consolidation of an existing regime, 3) the internal reorganisation of an existing regime, or 4) the creation of a new regime. [89]

The dissolution and recreation of a regime is the reallocation of responsibilities from an old agency, representing the old policy goals, paradigm and power arrangements to a new one, representing the new goals, paradigm and power arrangements. Consolidation of a regime is

---

87 Ibid, pp 264
88 Ibid, pp 265
89 Hayes, M (2006) *Incrementalism and Public Policy.* University Press of America, New York pp 131-143

the amalgamation of several agencies, which existed under the old regime into one agency, incorporating the goals of the new regime. Internal reorganisation of existing regimes accounts for the adjustment of a regime to the new paradigm and power arrangements and the adaptation of existing agencies to meet the needs these arrangements. The creation of a new regime is the establishment of new agencies to deal with new issues sometimes the result of political changes in the state.

The strength of this model is its ability to analyse policy change on multiple vertical levels and across multiple subsystems on specific issues, having drawn on a large portion of the literature. However, this yields a less distinct understanding of the concepts and definitions in the literature as they become increasingly flexible.[90] The model is further hamstrung, and particularly in the case of South African electricity policy, by its narrow focus on agencies and institutions organised around specific issues. South Africa's electricity policy is horizontally broad, spanning subsystems and several issues. While the model offers guidance in integration of vertical determinants of policy change -- key in the South African case -- it is insufficient for understanding the horizontal nature of the South African case which involves multiple issues and multiple subsystems.

Policy Paradigms and Paradigm Change

It is clear that policy regimes are determined and underpinned by their paradigms and the power and institutional arrangements which support them and it is changes in these relations that determine regime change. Institutional arrangements and political economy of a policy area are sources of power. Policy paradigms are, however, more nuanced and therefore merit their own treatment.

---

[90] Wilson, C (2001), pp 272

This thesis focuses on the barriers to policy change, while policy paradigms are typically studied in terms of how and why they change. If policy paradigms are a significant factor underpinning policy regimes, it follows that such a study would be enhanced by an understanding of why policy paradigms change, and conversely why they may not change.

Peter Hall's seminal work *Policy Paradigms, Social Learning, and the State*[91] discusses the nature of policy change in terms of orders of change and paradigm change in terms of social learning. For Hall, a policy paradigm is a "framework of ideas and standards"[92] specifying the policy problem as well as the objectives and policy tools used to address them. It is embedded in the policy area and difficult to critically examine from within the policy area. First and second order change represents incremental policy change and the development of new policies and policy instruments respectively. Third order policy change represents the change or switching of a policy paradigm.

Hall argues that modelling paradigm change is difficult because of the nature of paradigms as being not wholly measurable. This is further complicated by the influence of different paradigms on their respective policy actors, on their views, arguments and data that they accept. Paradigm change is thus presented as a sociological process rather than a scientific process, as decisions to switch paradigms are only partially based on scientific evidence. Switching paradigms is firstly a function of multiple factors such as: scientific evidence for a specific paradigm and intellectual support for the new paradigm, institutional positions and political advantages of competing factions and their available resources. Secondly, it is a function of authority; paradigm's whose experts carry the greatest authority have the advantage, particularly in technical cases such as electricity. Thirdly it is a function of policy

---

91 Hall, P (1993)
92 Ibid, pp 279

experimentation and policy failure.[93] The terms of policy paradigms are changed to cover policy failures, however, this undermines the coherence of the paradigm; if the paradigm cannot account for failures, this gradually erodes its authority.[94] The paradigm change ends as a new paradigm replaces the old paradigm, securing power over policy-making and policy-making institutions. This causes the emergence of a new regime.

This also means that policy made at time 0 has an effect on policy made at time 1, both incrementally and in terms of dramatic change through undermining the paradigm.

Hall argues that the process that leads to paradigm change is one of social learning. Building on the work of Heclo,[95] Hall finds that first and second order policy change are instigated through learning within the state. Hall further contributes to arguments made by Heclo and Skocpol,[96] asserting that social learning does not contradict statist theories of public policy making, but that public policy is primarily made by experts working within state structures. However, Hall finds that third order change is subject to social learning on the scale of the wider society and not within the state. First and second order change are driven through learning in state institutions by experts. Conversely, third order change is driven by political and societal forces --often by politicians and not experts. It is driven by the complex of political parties and interests groups and their representatives acting as mechanisms to pressure a shift in policy paradigms. These mechanisms will vary from case to case, but will include participants such as the media, business interest groups, civil society interest groups and opposition parties as well as state institutions. The mechanism works through its acquisition and exertion of political power.[97]

---

93 Ibid, pp (280)
94 Ibid, pp (280)
95 Heclo, H, (1974) *Modern Social Politics in Sweden and Britain.* Yale University Press, New Haven.
96 Skocpol, T (1985) Bringing the State Back In: Strategies of Analysis in Current Research in Evans, P et al (eds) *Bringing the State Back In.* Cambridge University Press, Cambridge.
97 Hall, P (1993), pp 283-287

Hall, additionally, makes the point that the resistance to policy change is supported by the presence of a coherent policy paradigm as a means to resist societal pressure, allowing the state some autonomy. It is not until this paradigm can be undermined that one is likely to see policy change.

The case for Policy Regime Theory in the study of South African Electricity Policy

Policy regime theory and policy paradigms are useful theoretical lenses through which to understand electricity policy in South Africa. Electricity policy in South Africa experiences the influences of multiple policy subsystems, across multiple actors, institutions, and issues. It is also subject to macroeconomic pressure and macroeconomic policy frameworks. These subsystems, influenced by these pressures clearly form a policy regime that uses its policy paradigm to resist reform in the electricity sector in preference to their own mutual and individual interests. This thesis hypothesizes the existence of an electricity policy regime based on a coalition of big business, Eskom and the Government. The divergence of the deep core beliefs of these interests means that applying ACF theory would be inappropriate. At the very least, an ANC led government will have differing deep core beliefs from big business, given the ANC's alliance with organised labour. Punctuated equilibrium theory does not demand the alignment of deep core beliefs, but its usefulness is limited to explaining systemic policy change, not paradigm change or specific policy change. Further it rejects incrementalism, which, as will be shown in the following chapter is a feature of South African energy policy. Policy regime theory does not demand that policy-making coalitions share deep core beliefs, but argues that it is the paradigm that is significant. This combined with the inherent incrementalism of South Africa's energy policy and the persistent links of policy in South Africa to overarching policy frameworks such GEAR and Asgi-SA means that policy regime

theory is the most appropriate choice for the study of South Africa's electricity policy.

The use of policy paradigms to understand technical fields and particularly energy policy is also well established internationally such as in Barkenbus [98]and Szarka,[99] as well as in the South African case in Marquard[100] and Tyler.[101] The high importance of the policy paradigm in regime theory analysis makes regime theory a natural choice as a lens through which to study electricity policy.

Building on de Oliveira and Girod,[102] Marquard[103] identifies four abstract paradigms in energy policy, which can be extrapolated to electricity policy in the South African case. These paradigms outline the policy making and institutional capabilities of the policy regimes present in a given context. The first is Autarky, where policy is not integrated, and infrastructure industries are pursued independently of one another in order to supply resource for economic growth. There is little or no planning or regulation or even a policy process in Autarky's system; policy decisions are made in order to create supply to meet demand with little consideration of other factors, designing growth models to meet linear demand growth.[104]

The second paradigm is Supply which implies the development of an integrated approach to energy planning. There are two primary elements to the Supply paradigm: 1) government integrates its policy making to energy policy planning decisions, and 2) government develops organisational and research capacity for energy planning policy. The paradigm is solely

---

98 Barkenbus, J (1982) Federal Energy Policy Paradigms and State Energy Roles in *Public Administration Review* 42, 5 pp 410-418

99 Szarka, J (2005) Wind power, policy learning and paradigm change in *Energy Policy* 34 pp 3041–3048

100 Marquard, A (2006)

101 Tyler, E (2009) *Aligning South African energy and climate change mitigation policy.* Energy Research Centre, University of Cape Town. Available at http://www.erc.uct.ac.za/Research/publications/09Tyler_Policy_alignment.pdf [accessed 2/06/2011]

102 De Oliveira, A and Girod, J (1990) Energy diagnosis: Toward a policy-oriented approach for energy planning in developing countries in *World Development,* 18, 4, pp 529-538

103 Marquard, A (2006) pp 54

104 Ibid, pp 56-58

concerned with the supply of energy to meet demand. Beyond temporary demand constraints in the face of supply shortages, it does not address demand side or other factors. It uses economic rationality to plan measures to supply aggregated demand at the cheapest possible price through econometric modelling.[105]

The third paradigm is the Supply/Demand paradigm. New pressures on the energy sector stemming from the falling of economies of scale and rising costs of increasing supply -- originally experienced during the oil shortages of the 1970s and environmental factors -- force policy makers to consider arrangements in the energy system and not only the energy supply sector. The energy system is the network of energy use from production through its transformations to its end use. Policy measures now affect demand as well as supply and policy makers strive for efficiency over energy conservation in supply crises. Demand no longer solely determines energy policy.

The Supply/Demand paradigm comes in a weak and a strong form. The weak form simply introduces demand into the policy equation; the strong form focuses on the end use of energy to work backwards to find the best system to achieve that end. Successful adoption of this paradigm demands institutional expansion beyond research, data collection and planning capacity. Building institutional capacity in all aspects of the system that are capable of instituting change -- from electricity production to industrial regulations to building standards and appliance efficiency – is necessary. This expands the role of additional areas of government in developing policy interventions and broadens the state's means of addressing energy problems, but also increases the complexity of doing so.[106]

Marquard's final paradigm is the Structural/Cultural. This paradigm has thus far not

[105] Ibid, pp 58
[106] Ibid, pp 58-60

experienced in any energy regime; it is influenced by complex challenges to energy systems, such as global warming, energy poverty and resource shortages. The Structural/Cultural addresses the relationship between society and energy, not only the energy system. It approaches policy in terms of energy services, as the end purpose of energy production, house warmth over electricity. It incorporates non-energy solutions to traditional problems, such as passive solar heating for houses and energy efficient construction practises. It represents a cultural change in a society's approach to energy, emphasizing design change over technical change. This final paradigm is typified by institutional decentralisation, with an increased need for sensitivity to local conditions, and mergers between energy specific institutions and institutions from other increasingly related policy areas, such as water affairs.[107]

Tyler argues that South Africa's energy policy up until 1998 has, on paper and in action, been informed by the Supply paradigm, but subsequent to 1998, has on paper tended toward the Supply/Demand paradigm. Despite having policy documentation intent on having a policy that would increasingly fit into the Supply/Demand paradigm, with multiple proposals seeking efficiency in the system, there is little evidence to suggest an intention to implement that policy. Thus, there has not been a genuine shift in policy paradigms in the South African electricity sector.[108]

[107] Ibid, pp 60-61
[108] Tyler, E (2009) pp 8-13

Chapter 3

South Africa's Electricity Policy Regime

The presence of an electricity policy regime and its terms need to be established before using policy regime theory to understand barriers to change in South Africa's electricity policy. Understanding who makes electricity policy in South Africa and analysing the policies produced helps determine the power arrangements, paradigm, organisation and policy of the regime itself. In order to achieve this determination, this chapter will examine three critical policy documents:

- The 1998 White Paper on the Energy Policy of the Republic of South Africa (and the subsequent Eskom Conversion Act of 2001);[109]
- the 2003 White Paper on the Renewable Energy Policy of the Republic of South Africa[110]; and
- the Integrated Resource Plan 2010-2030[111] (in the context of related policies such as the White Paper on climate change and the Integrated Energy Plan).

There are several reasons for this particular selection of policies : a) they cover a 13 year period between 1998 and 2011, which allows for tracing regimes and paradigms over time; b) they all address issues that open opportunities for increased sustainability in the South African energy system and electricity in particular, which will show how regimes can act as a persistent barrier to sustainability; c) they represent policy measures that are significant to all interests in the energy and electricity sector, from business, multiple levels of government, Eskom, consumers, independent power producers (IPPs) and sustainability activists.

The White Paper on Energy Policy

---

[109] Department of Minerals and Energy (1998) White Paper on the Energy Policy of the Republic of South Africa

[110] Department of Minerals and Energy (2003) White Paper on the Renewable Energy Policy of the Republic of South Africa

[111] Department of Energy (2011) Integrated Resource Plan for Electricity 2010-2030

The 1998 White Paper on the Energy Policy was developed in response to the country's changing political environment both internationally and domestically, and changed conditions in energy demand and supply possibilities.[112] These changes include the end of international oil embargoes toward the end of Apartheid and the need to address energy poverty, particularly in rural areas, for those excluded by the Apartheid government. The white paper was formulated out of responses to the Ministry of Mineral and Energy Affairs Energy Policy Discussion document, of which there were in excess of 100. The white paper was primarily driven by the government, particularly the Department of Public Enterprise, which sought to normalise the structure of Eskom, in the name of corporate transparency and efficiency. The white paper was also driven by a broader government support for improved efficiency, as described in the GEAR macroeconomic plan, and supported by business seeking to ensure low cost electricity. Eskom also supported the plan, but only to the extent that it did not damage its control over the electricity industry.[113]

The white paper laid out five primary objectives: 1) increasing access to affordable energy services, 2) improving energy governance, 3) stimulating economic development, 4) managing energy-related environmental impacts and 5) securing supply through diversity.[114] With respect to each of the policy objectives, the white paper prioritised the following for the electricity sector:

1) developing a policy for electrification of households, including planning and financing; improve energy delivery to households, including electrification; standardise the approach to both in and off grid electrification.
2) Improving government's capacity to govern the energy sector, improve the policy formulation process; promulgate a new regulatory bill to consolidate the electricity regulatory regime.
3) Appoint an authority to oversee the restructuring of the electricity distribution industry.

---

112 Department of Minerals and Energy (1998) pp 17
113 Eberhard, A (2007) pp 246-247
114 Department of Minerals and Energy (1998) pp 23-27

4) Monitor the effect of electrification on the number and severity of fires caused by candles and paraffin.
5) Develop the Southern African Power Pool to the mutual benefit of all of its members.[115]

In terms of industry, mining and commercial demand the white paper commits the government to promoting energy efficiency and developing 'holistic' energy programmes for the sector. This was despite government wariness of regulating energy efficiency and sustainability out of fear of sending 'inappropriate economic signals,' a 'lack of access to efficient technologies,' the need to ensure a high return on investment and 'the high cost of capital'.[116] It also commits the government to ensuring standards of reliability and quality of supply in the electricity industry, and developing a database of energy demand, available to the public.

In terms of interventions affecting the electricity industry on the supply side, the white paper makes prescriptions across the sector aimed at improving social equity, ensuring efficient, low cost, high quality electricity to industry and mining and environmental sustainability in the use of resources. This, the white paper argues, could be achieved through the rationalisation of distribution, the introduction of competition and the private sector.[117] The white paper commits the government to the following:

1) Consolidating distribution through the establishment of independent regional electricity distributors, owned by government and controlled by the private sector. This would be achieved through a transition where Eskom and municipalities participate in the separation of distribution form other functions and services[118]
2) Ensuring transparent and cost reflective tariffs and transparent funding for

115 Ibid pp 27-28
116 Ibid pp 34
117 Ibid, pp 42
118 Ibid, pp 44-45

electrification.[119]

3) Establishing policies for differential pricing for industries based price sensitivity for competitiveness[120]
4) Coordinating the electrification programme and differentiating between connections from new developments and the reduction of the backlog[121]
5) Implementing legislation to realise universal household access to electricity gradually through the use of rolling targets[122]
6) Using integrated resource planning methodologies in evaluating further electricity supply investments and decommissioning old power stations[123]
7) Encouraging the introduction of competition into the generation market, with multiple players[124]
8) The long term restructuring of Eskom into separate generation and transmission companies[125]
9) Legislation for open access of uncommitted transmission line capacity, managed by Eskom, with cost and pricing information supplied to the NER[126]
10) Sound governance of the electricity supply sector for the development of the electricity supply industry[127]
11) Consolidating the electricity sector regulatory regime, establishing the powers and functions of the National Electricity Regulator and guidelines on its regulatory philosophy and approach.[128]
12) Strengthening the Department of Mineral and Energy's capacity to deal with

119 Ibid, pp 46
120 Ibid, pp 47
121 Ibid, pp 48
122 Ibid, pp 48
123 Ibid pp 53
124 Ibid, pp 54
125 Ibid, pp 55
126 Ibid, pp 55
127 Ibid, pp 57
128 Ibid, pp 57

electricity policy challenges.[129]

In term of the power arrangements, it is clear that the government and Department of Public Enterprises were the dominant force in the policy process, and this was supported by the economic power of business. However, Eskom's ability to resist much of the reform called for in the development of the policy -- particularly the devolution of 30% of its production capacity to private hands[130] -- demonstrated that it too holds significant power within the regime. Applying Marquard's theory of energy policy paradigms, we see that this policy falls into the Supply paradigm, with some weak elements of the Demand/Supply paradigm. It is dominated by concerns for ensuring supply and expanding supply to meet demand, safeguarding economic development. It pays lip service to concerns about the environment and sustainability in South Africa's energy and electricity policy, particularly by proposing the development of renewable energy sources in the medium term and the adoption of integrated resource planning methodologies.[131] But it falls short of specific demand side interventions or institutional developments, focussing rather on the collection of information to assess viability, with the condition that increasing costs, which could threaten the further development of established industry are avoided. It continues to mandate the supply of energy, particularly electricity to industry, mines and commerce at cheap prices to ensure economic growth. The white paper does recognise the need for efficiency in commercial agriculture. The policy's approach to energy efficiency measures, only prescribes research (or simply data collection) into efficiency possibilities, making it arguably a weak version of the third paradigm. While it expresses concerns for efficiency and environmental damage, its primary demand side focus is on providing alternative sources of household energy for rural dwellings, primarily electrification to replace wood, coal and paraffin.[132] The white paper is largely focussed on electricity as the source of energy, with relatively little attention paid to the end use of energy, and efficient means of achieving

129 Ibid , pp 57
130 Eberhard, A (2007) pp 247
131 Department of Minerals and Energy (1998), 28-29
132 Ibid, pp10-11

that end use. An exception to this is in the case of rural households, where the inappropriateness of electricity is considered; however this amounts to a relatively small amount of South Africa's energy consumption.

With respect to the objectives of the white paper, successes have been limited. The government achieved its objective of widespread access to electricity. It provides a limited amount for free but this is not enough to heat and cook for a household, only enough to provide lighting and causes an increase in energy expenditure if consumers make decisions to switch cooking methods.[133, 134] Prices over and above this amount have increased significantly.[135] Neither security of energy (specifically electricity supply), nor supply diversification have been achieved; the country remains heavily reliant on coal for energy and electricity, with supply often interrupted.[136] Structural reform of the electricity distribution industry has been abandoned[137] and structural reform of the electricity supply industry has been slow, with little action to date, beyond the statements of intent to phase in independence of the transmission grid and allow private producers to enter the market.[138] The adoption of integrated resource planning methodologies has been limited, with old-fashioned supply forecasting still the predominant tool, as demonstrated later in this chapter. Governance has been improved with the introduction of the NERSA, but little has been done to mitigate the energy sector's environmental impact. Changes challenging the supply regime have therefore been

[133] Davis et al (2008) The Impact of Free Basic Electricity on Energy Choices in Low Income Households: A Case Study in South Africa. PESD working paper #80 available at http://iis-db.stanford.edu/pubs/22331/WP_80,_Davis_Hughes_Louw,_FBE_in_South_Africa.pdf [accessed 16/09/2011] pp 13

[134] Malzbender, D et al (2005) Domestic Electricity Provision in the Democratic South Africa. Paper produced for the Nordic Africa Institute's Conflicting Forms of Citizenship Programme. available at http://www.acwr.co.za/pdf_files/01.pdf [accessed 16/09/2011]

[135] NERSA (2009) NERSA's decision on Eskom's application for an interim price increase available at http://www.nersa.org.za/Admin/Document/Editor/file/News%20and%20Publications/Media%20Releases%20Statements/Media%20Statement%20-%20NERSA%20decision%20on%20Eskom's%20application%20for%20an%20interim%20price%20increase%2025%20June%202009.pdf [accessed 16/09/2011]

[136] Eskom (2006) Multi-Year Price Determination of Eskom from 1 April 2009 to 31 March 2012: First Consultation Paper. Available at http://www.nersa.org.za/Admin/Document/Editor/file/Electricity/Consultation/Documents/Eskom%20MYPD%20April%202009%20-%20March%202012.pdf [accessed 16/09/2011] pp 13

[137] Hartley, W (2010) Government shuts regional power distributors in *Business Day* 09/12/2010 available at http://www.businessday.co.za/articles/Content.aspx?id=129092 [accessed 16/09/2011]

[138] Department of Energy (2011) Independent System and Market Operator Establishment Bill

ineffective. There has been limited legislation for the provisions in the White Paper. The limited action came primarily in the form of Eskom Holdings Limited by passing the Eskom Conversion Act of 2001 and the National Energy Act of 2008. The Eskom Conversion Act fails to make the necessary changes to the electricity market that White Paper proposes to create competition in the industry. Instead, it maintains a full or majority government shareholding over Eskom and Eskom Holdings and legislates Eskom's continued maintenance of universal access to affordable electricity.[139] The National Energy Act legislates the creation and maintenance of the South African National Energy Development Institute (SANEDI), to research and maintain accurate energy data in term of supply and demand. This Act also includes the use and production of periodic Integrated Energy Planning and Integrated Resource Planning. The terms of these methodologies are not specified, and are legislated to take into account economic viability and developmental concerns without legislating any energy efficiency measures.[140]

The White Paper on Renewable Energy Policy

The 2003 White Paper on Renewable Energy Policy was prepared as a supplement to the 1998 Energy White Paper. It sought to set out the government's goals and policy principles as well as the methods of achieving them for the implementation of renewable energy in South Africa. This white paper was also intended as an information source for the public, international community and organs of state on these goals, principles and methods as well as the roles of the organs of state in implementing them. It outlines the government's vision for the role of renewable energy as an increased and affordable share of energy consumed and accessed throughout the country, in support of sustainable development and environmental conservation.[141]

The White Paper examines South Africa's energy and economic context in addition to the legal and

139 Eskom Conversion Act (2001), pp 3
140 National Energy Act (2008), pp 9-10
141 Department of Minerals and Energy, 2003, pp 1.

institutional arrangements of its energy sector, including constraints to the incorporation of renewable energy sources into the sector. It outlines the constraints to incorporating renewable energies into the sector as:

- high costs, particularly of capital;
- high initial investment requirements; limited consumer awareness;
- an economic and social system based on centralised systems and conventional energy, particularly electricity;
- financial, legal, organisational and regulatory barriers;
- a lack of open access to energy infrastructure, particularly the national electricity grid;
- and the dominance of utilities.[142]

It examines renewable energy options including wind, biomass, bagasse, hydro, solar, wave and tidal energy, and options for establishing renewable energy power plants, noting the constraints of the centralised nature of South Africa's energy services system and its specific dependence on electricity. It specifically identifies solar water heating, landfill gas, biomass and biofuels, small scale hydro, solar and wind electric technologies as having potential in the short term, with longer term options including tidal, wave and ocean current and hydrogen fuel cells.[143]

The white paper also commits the government to a number of measures. Specifically, these measures are:

1) Encourages Research and Development into cost-effective energy storage including renewable energy systems as well as the promotion of the local manufacture of renewable energy technologies.[144]
2) Sets a target of 10 000 GWh (4% of final consumption) renewable contribution to final energy consumption by 2013, primarily through renewable electricity generation options,

142 Ibid pp 9-10
143 Ibid, Pp 24
144 Ibid, pp 24

but also through solar water heating and the use of bio-fuels.[145]

3) Supports an economic efficiency based programme for the introduction of renewable energy with continued and sustained growth, and that allows government to measure and control support of it.[146]
4) Supports and facilitates the dissemination of information and training to encourage participation in the renewable energy market by both the private and public sector.[147]
5) Will make thermal efficiency a requirement for the awarding of housing subsidies and will develop appliance efficiency standards and enforce labelling.[148]
6) Ensures the incorporation of empowerment into government supported renewable energy projects. [149]
7) Grants the Department of Minerals and Energy overall responsibility for the coordination of renewable energy policy in the country in collaboration with related institutions and Government Departments.[150]

The white paper, as an offshoot of the 1998 white paper, was again driven primarily by the government, through the Department of Minerals and Energy. However, low levels of implementation suggest that it did not have wide support throughout the paradigm, suggesting significant levels of power within the regime for those without specific interests in the renewable energy white paper. Energy-intensive business and particularly Eskom are suspicious of the implications of widespread renewable energy adoption, and have to a large extent limited its implementation, suggesting significant power within the policy regime.

Again, applying Marquard's paradigms, this policy would fall into the second supply paradigm. It

145 Ibid, pp 25
146 Ibid, pp 29
147 Ibid, pp 32
148 Ibid, pp 37
149 Ibid, pp 39
150 Ibid, pp 41

focuses almost exclusively on finding ways of integrating renewable energy into the existing energy and specifically electricity system. This neglects addressing demand side issues, focussing primarily on ways to increase electricity supply, by incorporating renewable energies, to meet growing demand. Third paradigm energy policy making demands the use of least demand side mitigation (in the weak sense) and the consideration of end use of energy before the supply choice is made (in the strong sense). There is little consideration of end use appropriateness in the White Paper, with a preference for simple partial substitution of electricity supply. There is some demand side intervention (requiring improved efficiency in government subsidised housing, and the promotion and subsidisation of solar water heating in new buildings and households) but this is minor in comparison to simply finding renewable supply mechanisms to provide electricity to households and industry. Despite advocating research into the inclusion of environmental costs into energy accounting practices, the White Paper advocates incentives for the minimisation of electricity costs.[151] This further anchors the policy in the Supply paradigm, ensuring supply based solutions to maintain low cost for the sake of economic rationality. Additionally, the policy makes no call for demand side intervention in the county's electricity intensive industries (beyond the installation of solar water heaters) and warns of the potential economic impacts of demand side mitigation and energy efficiency programmes.[152]

In terms of action, there has been little response to this policy. Its implementation plan has not been developed. No further progress is likely before the finalisation of its mid-term review (which was due at the end of the first quarter of 2011, but as of September 2011 has not been released, despite the fact that it is needed to inform the IRP2010, which has already been promulgated). It seems unlikely that 10 000 GWh in renewable energy will come online by 2013. The use of solar water heaters is below 2% of the potential market with only some 77 000 installed, and this is primarily

151 Ibid, pp 27
152 Ibid, pp 36.

privately, not government, driven.[153]

Further, the 2003 White Paper, in line with the 1998 White Paper, seeks to introduce private electricity producers into the generation market. This is to allow for the private generation of renewable electricity in an efficient and competitive way. As of 2011, significant barriers to entry remain for independent power producers. The Independent System and Market Operator has not yet been established meaning that IPPs are still relying on Eskom to purchase their electricity. NERSA has established a Renewable Energy Feed-In Tariff. This tariff creates a facility for the purchase of privately produced renewable energy (minimum plant size of 1 MW) at a price higher than would be paid for coal power. This is to incentivise production of, and to establish a market for, renewable electricity. Having set varying tariffs for varying types of renewable electricity in 2010, in June 2011 NERSA reduced the tariffs, despite not having implemented any power purchasing agreements. This has created further uncertainty and reluctance to invest amongst IPPs. Additionally, there is limited commitment to sign the long-term power purchasing agreements necessary to ensure the viability of IPPs in the market.[154] Therefore, there is a lack of political will to drive the introduction of renewable energies, given the lack of action since 2003 despite the rollout of plans for new electricity capacity and the slow reform of Eskom. This suggests that the dominant electricity policy regime is resistant to the efficiency regulations and renewable sources, preferring existing suppliers and methods.

The Integrated Resource Plan for Electricity 2010-2030

The purpose of the Integrated Resource Plan was to outline the build fleet for South Africa's electricity industry for the period 2010 to 2030. The plan is to be reviewed every two years for the twenty year period and seeks to determine the best build mix for new power generation methods

[153] Trollip, H et al (2010) *Prospects for renewable energy in South Africa* published by Heinrich Boell Stiftung Southern Africa available at http://www.boell.org.za/web/climate-change-614.html [accessed 13/09/2011] pp 4.
[154] Ibid

and plants. It was developed through a repeated consultation process, considering multiple packages of potential new generation capacity. However the plan was drafted by the Department of Energy's (DOE) technical task team consisting of:

- four representatives from the DOE
- two from Eskom,
- five from members or major shareholders of Energy Intensive User Group members,
- one from the Chamber of Mines,
- an academic,
- an Eskom-linked energy consultant, and
- one representative from the South African Independent Power Producers' Association.

This demonstrates the power government, Eskom and energy-intensive users have over the policy choices in developing the IRP2010.

The government adopted the plan's Revised Balanced Scenario, developed after public consultation and seeking to achieve a balance of government's objectives in the face of a series of constraints. The government's objective in developing the IRP are stated as expanding supply side capacity to meet long-term future electricity demand, incorporating demand mitigation as well as supply side interventions. It focuses exclusively on the electricity sector, informing but not integrating with other energy plans.[155] It lists the constraints as: 1) reducing carbon emissions; 2) uncertainty with new technologies, of costs, lead times and operability; 3) restricted water usage; 4) the need to localise and create jobs; 5) Southern African regional development and integration; 6) the need to ensure security of supply. [156]

Through the evaluation of several possible scenarios (given expected growth in electricity demand

[155] Department of Energy, (2010) Integrated Resource Plan for Electricity Draft pp 2-3
[156] Department of Energy, 2011, pp 7

up until 2034), the plan adopts the policy adjusted revised balanced scenario. Each scenario was evaluated in terms of water usage, cost and impact on future electricity prices, climate change mitigation, levels of risk and uncertainty incorporating diversity of supply, its contribution to localisation and its contribution to regional development.[157] This scenario commits the government to the following interventions in the electricity sector:

- Selecting a mid-level option emission constraint of 275 million tons by 2025;
- the construction of 9.6 GW new nuclear capacity;
- placing no limits on the import of coal, and coal and hydro electricity from neighbouring countries;
- limiting Energy Efficiency Demand Side Management interventions to 3.42 GW by 2017 and the same until 2030.[158]

The plan further commits to building new generation capacity from the following sources in Table 1:

Table 1

NEW BUILD CAPACITY[159]	
Coal	6.3 GW
Imported Hydro electricity	2.6 GW
Combined cycle gas turbines (CCGT)	2.4 GW
Peak open cycle gas turbines (OCGT)	3.9 GW
Combined Renewable sources (photo-voltaic solar, concentrated solar power, wind power)	17.8 GW (8.4 GW, 1 GW, 8.4 GW)

This is in addition to the already committed listed in Table 2:

157 Ibid, pp 26-27.
158 Ibid, pp 11-12
159 Ibid, pp 15

Table 2

PREVIOUS COMMITMENTS CAPACITY[160]	
Return to Service Capacity (recommissioning of "mothballed" coal power stations)	1.463 GW
Medupi Coal Power Plant	4.332 GW
Kusile Coal Power Plant	4.338 GW
Pumped Storage	1.332 GW
Diesel Open Cycle Gas Turbines	1.020 GW
Wind	0.7 GW
Solar	0.2 GW
Landfills	0.125 GW
Other sources	0.6 GW

This plan increases total electricity supply from 44535 MW in 2010 to 89532 MW in 2030 to meet demand which is expected to rise from 38885 MW in 2010 to 67809 MW in 2030.[161]

Eight alternative scenarios were considered and assessed in terms of the described criteria which were weighted approximately 22% towards cost, 22% to CO_2 emissions reduction, 11% towards water usage reduction, 20% towards risk and uncertainty, 15% towards localisation potential and 11% towards contribution to regional development. The scenarios included a base case option, which amounts to a continuation of current power source patterns; this scenario scored the best marks for cost. They included three reduced emission scenarios, one based on an immediate reduction to below 275 million ton per year emission target (effectively by 2018), one based on a reduction to below 275 million tons per year by 2025, one based on a reduction of emission to below 220 million tons by 2020, of which the second was the most cost effective. The third was the most expensive of all scenarios, but was significantly better than all others with respect to water

[160] Ibid, pp 14
[161] Ibid, pp 14

savings.[162] They included a carbon tax option, which scored second worst of all the scenarios for cost. A regional development focussed option scored second highest for cost effectiveness but very low in all other criteria except for regional development. An enhanced demand side mitigation option based on the base case scored highly in terms of cost, low in terms of in other areas and comparatively low in terms of risk and security. A balanced scenario scored second best overall, behind the first emissions scenario, performing well in all areas except water usage and regional development. Subsequently, this last scenario was revised and scored highest overall, scoring particularly high in cost, regional development, risk and localisation, but only placed fourth with a middling score on reducing CO_2 emissions, and fourth with a fairly low score on water usage.[163] This revised balanced scenario was adopted in early 2011.

Power in making electricity policy clearly still lies with government, Eskom and Energy Intensive industry through their privileged access to the policy writing process in the technical task team. In terms of the Marquardian paradigms, the IRP 2010-2030 again represents an example of policy making within the Supply paradigm, with some elements of a weak Supply/Demand paradigm. The stated focus of the plan is to ensure electricity supply for growing electricity demand. It is focused solely on the electricity sector, with no attention to end use appropriateness. It partially addresses demand through demand side mitigation strategies but this is limited to a fairly small amount, around 5% of future expected demand; it was not initially incorporated in all scenarios, and while additional potential for mitigation was acknowledged, it is dismissed as a risk to supply security.[164] The plan's critics further argue that IRP 2010-2030 initially overestimates the costs of renewable energy sources.[165] While it reduces them in later versions, the plan does not adequately account for the future reduction in costs through 'technology learning' (expected to be steep, particularly in the

---

[162] Ibid, pp 24-25
[163] Ibid, pp 26
[164] Ibid, pp 36
[165] Idasa (2010) Submission on the draft integrated resource plan assumptions. Pp 2. Available at http://toolkits.reeep.org/file_upload/8917_tmpphpdB3IJQ.pdf [accessed 13/09/2011]

cases of solar power),[166] and that its methodologies do not truly reflect sophisticated integrated resource planning approaches, but rather an advanced exercise in demand forecasting to build sufficient supply.[167] The plan therefore reveals a strong resistance to a genuine shift to end use energy and electricity planning, preferring electricity as a means of energy provision, with little consideration of the purpose that energy is put to. This further suggests a strong policy regime with an interest in granting preference to electricity, and ensuring an abundant supply of it.

The development and timing of the policy also reinforces its Supply paradigm categorisation. The IRP 2010 is exclusively an electricity planning policy, with plans extending into the long term. However, it was developed and finalised before four policies that should inform its choices. These policies are the Integrated Energy Plan (IEP), the White Paper on Climate Change, the Independent System and Market Operator Establishment Act and the Renewable Energy White Paper Mid Term Review. For energy and electricity policy planning to be categorised as paradigm three or paradigm four, electricity planning (the IRP 2010) needs to be informed by the Integrated Energy Plan, which determines the country's energy choices based on end use planning, and renewable energy targets (White Paper review) and the country's climate change mitigation strategies, especially given that the electricity industry is South Africa's primary carbon emitter. The structure of the electricity industry itself should also inform the state's electricity planning processes. This structure is likely to change significantly with the introduction of the Independent System and Market Operator, the lack of which has been significant barrier to the entry of independent power producers to the market. The release date for the IEP is, at the time of writing of this study, unknown. The White Paper on Climate Change is due in late 2011 and the Renewable Energy Mid Term Review is long overdue its 2009/2010 financial year initial release date. The Independent System and Market Operator Establishment Bill is before parliament at the time of writing.

[166] Trollip, H et al (2010)
[167] Idasa (2010)

South Africa's electricity policy regime

It is clear from the above the dominant regime in electricity policy in South Africa is firmly located in the Supply paradigm. This also suggests the regime has not changed significantly since the introduction of the Energy White Paper in 1998, or perhaps even since the oil crisis of the 1970s, with the exception of some changes in institutional arrangements and players in the regime. If changes have occurred, they appear to have deepened the coalition between government, Eskom and energy intensive industry, with the three cooperating in the drafting of policy with little other outside influence. It is clear that the regime has coalesced around the issue of cheap electricity, which is underpinned by the belief in neoliberal economic solutions as the best source of growth and development. The power arrangements are stacked in this regime's favour. Eskom holds knowledge and skills and controls the country's power infrastructure (significantly as the primary supplier of information to the regulator). The mining and mining related manufacturing industries hold significant economic power, which is unrivalled in this policy area in the country. Political power is held by the government and ANC, which understands growth in the industrial sector to be its best source of economic growth job and job creation, and derives significant support from workers and unions in energy intensive industrial and mining industries. Industry enjoys international competitive advantage through the cheap cost and preferential industrial pricing of South Africa's electricity and relative abundance of supply.

Institutional arrangements in energy and electricity policy have changed somewhat over the period, particularly with respect to oversight. Oversight by government ministries and departments has shifted, from commercially specified oversight to specifically energy specified oversight. This results in more attention and skills being devoted to energy policy but also a loss of coordination in policy making and confusion around reform in the electricity industry, particularly with respect to

private and renewable power production.[168] The establishment of the NER and then NERSA provided electricity oversight institutions with some of the capacity required to formulate policy independently of Eskom, although Eskom's influence in government's policy-making process still appears significant. Eskom remains the primary information supplier to the regulator,[169] as the activities of the state funded South African National Energy Research Institute and the South African National Energy Development Institute remain limited as these institutions are in their infancy with limited capacity and funding.[170] This leads to typical information asymmetries experienced by regulators, whereby vertically integrated monopolies retain more accurate information on demand and costs, and have better access to the information, making it difficult for the regulator to work against the monopoly's incentive to act anti-competitively.[171] To overcome this challenge requires extensive resources for the regulator; NERSA retains only four full time and five part time staff in terms of the National Energy Regulator Act.[172] Additional regulator responsibilities include licensing both producers and distributors, over which it has little power to act independently without interference from municipalities and Eskom in terms of the constitution.[173]

This chapter has also demonstrated that the policies themselves have changed little over this period. They continue to place availability of supply of electricity ahead of other considerations, in the interest of economic development. This includes seeing sustainable energy sources primarily as an opportunity for economic growth rather than as part of a comprehensive strategy to achieve long-

---

168 Idasa (2009) *Conflicting Policies for renewable energy in South Africa*. Available at http://www.idasa.org/our_products/resources/output/conflicting_policies_for_renewable/?pid=electricity_governance [accessed 20/09/2011]

169 NERSA (2007) *Consultation Paper: Eskom Application for Multi-Year Price Determination Rule Changes*. Available at http://www.nersa.org.za/Admin/Document/Editor/file/Consultation%20paper.pdf [accessed 01/10/2011] pp 20.

170 Tyler, E (2009) pp 12-13.

171 Gillward, A (2009) Good Intentions, Poor Outcomes: Telecommunications Reform in South Africa in *Telecommunications Policy* (29) pp 469-91. Pp 483.

172 Newberry, D et al (2008) *South African Network Infrastructure Review: Electricity*. Paper written for the National Treasury and thh Department of Public Enterprises, Government of South Africa. Available at: http://www.gsb.uct.ac.za/files/SAElectricityPaper08.pdf [accessed 09/08/2011] pp 74-75.

173 Ibid, pp 74-75

term energy sustainability. This is also demonstrated by the reluctance to enforce demand side mitigation measures for fear of the economic and investment consequences. Electricity is seen as an essential industry, not as not as one of several potential energy sources for services.

The manifestation of this regime appears to be built around five major players: the Department of Energy (DOE), Department of Trade and Industry (DTI), Department of Public Enterprises (DPE), Eskom, and the large mining and industrial consumers. The Department of Energy promulgates electricity policy; the DTI has industrial policies which view cheap energy as a source of international economic competitiveness and renewable energy only as a possibility for growth; the DPE persists in its ownership of Eskom; and large mining and industrial consumers established the Energy Intensive User Group (EIUG), a lobby group that lobbies for cheap energy for industrial players in the name of sustainable economic growth.[174] The User Group's membership accounts for 44% of the country's electricity consumption and includes miners such as Bhp Billiton, Anglo Platinum, industrial manufacturers such as ArcelorMittal SA, cement producer PPC Cement, formerly government owned energy company Sasol and majority government owned transport company Transnet, deepening the government's interest in lowest possible cost electricity and energy users access to government.[175] Since 2008 an additional lobby group, the Manufacturing Circle, who share several members with the EIUG, including ArcelorMittal SA and PPC Cement,[176] has established a working group the Departments of Trade and Industry and Economic Development to expedite the IPAP and address rising input costs.[177] It has also petitioned NERSA to

[174] EUIG, The Energy Intensive Users Group of Southern Africa. available at http://www.eiug.org.za/about/ [accessed 20/09/2011]

[175] EUIG, EUIG Membership. available at http://www.eiug.org.za/membership/ [accessed 20/09/2011]

[176] Manufacturing Circle (2011) *Member companies and representatives.* Available at http://www.manufacturingcircle.co.za/member_companies.html [accessed 01/10/2011]

[177] Department of Trade and Industry (2011) *Government and manufacturing circle form a working group to speed up key issues in the Industrial Policy Action Plan (IPAP)and New Growth Path.* Available at http://www.info.gov.za/speech/DynamicAction?pageid=461&sid=20940&tid=40257 [accessed 01/10/2011]

prevent further Eskom electricity price increases above 9%.[178] This has further strengthened the prevailing Supply paradigm policy regime.

[178] Creamer, T (2011) *Manufacturing jobs vulnerable to yet more power price increases.* Available at http://www.engineeringnews.co.za/article/manufacturing-jobs-vulnerable-to-yet-more-power-price-increases-2011-09-27 [accessed 02/10/2011]

Chapter 4

Barriers to Regime Change

As discussed in chapter 2, in order for paradigmatic changes in policy to occur, regime change or a paradigm change in the existing regime is necessary. As demonstrated in chapter 3, South Africa has had a stable regime determining electricity policy since democratisation, organised around the need to ensure secure electricity of supply at the lowest possible cost in the interests of economic development and industrialisation. This regime limits the country's ability to respond to the challenges presented by climate change. Resource shortages and long term economic stability point toward the likelihood that the country's ability to maintain comparative advantage through cheap electricity will decline given the immediate investment requirements of the industry and increasing limitations on the availability of coal.[179]

There are significant barriers to ousting this policy regime and replacing it with one that pays more significant attention to these issues. These barriers are best understood through policy regime change theory (as discussed in chapter 2), which argues that in order for policy regimes to change several conditions are necessary. The regime needs to be exposed to stressors and enablers (which test the regime and its ability to control the policy area), paradigm shifts (through a change in the intellectual credibility of the regime), power shifts (a change in the ability of regime members or members of competing regimes to influence policy choices and their regulatory arrangements), a legitimacy crisis (through which public belief in the regime and its paradigm is eroded) and finally, organisational and policy change (through change in the policy positions and the organisation and institutional boundaries of the sector). This chapter will examine the extent to which the South Africa electricity policy area has experienced these conditions, how the current regime has resisted them and demonstrate that ousting the regime is a significant barrier to South Africa's energy

[179] Hartnady, C (2010) South Africa's Diminishing Coal Reserves in *South African Journal of Science* 106(9/10) pp 4

sustainability.

Stressors and enablers

The South African electricity sector has experienced a number of stressors and enablers since democratisation in 1994. Immediately following the transition it was put under significant political pressure to ensure that access to household electricity was universalised. Within a few years the sector was under significant political pressure to restructure, in terms of both its transmission and its distribution systems. Just over a decade after the first elections, the sector faced its most significant stressor: a supply crisis since 2006, whereby there are periods when demand exceeds supply (during maintenance operations) and load shedding is necessary. This shortage of supply has necessitated the construction of additional capacity that was not adequately planned for, resulting in significant financial implications for both Eskom and the state. This financial burden is the fourth significant stressor on the sector. Additionally, international pressure aimed at climate change mitigation has created a fifth stressor, due to South Africa's high emissions levels.

In response to the first stressor, the regime has been mostly successful in providing universal access to electricity. The National Electrification Programme has succeeded in giving a large majority of citizens access to electricity in some form, including a free monthly allocation.[180] Electricity remains comparatively expensive for these household to use and is not necessarily the primary household energy choice despite access. The regime, however, has effectively overcome this stressor.

The regime has also been successful in resisting political pressure to restructure the electricity distribution and transmission sectors. Government has abandoned plans to introduce regional

[180] Tinto EM and Banda KG (2005) The Integrated National Electrification Programme and political democracy in the *South African Journal of Energy* 16 (4) pp 29-30

electricity distributors that would have removed the responsibility from municipalities. This is mainly due to the financial implications on the treasury of removing a significant revenue stream from the municipalities and the municipalities being unwilling to cede constitutional rights to manage electricity distribution.[181] A government belief in fiscal prudence as important for economic stability and as a signal to investors underpins this resistance.

The supply crisis, which was highlighted by power outages in the Western Cape in 2006, attracted close public scrutiny of the future supply situation. This crisis is regarded as the most significant stressor on the regime -- it has done the most to threaten its legitimacy. As a result of this crisis, South Africa recognized the need for significant investment in new electricity supply to meet growing demand and replace ageing infrastructure.[182] This had not been planned for in electricity pricing.[183] Instead of increasing pricing to finance necessary infrastructure upgrades, the regime created its own fourth stressor: the decision to use debt to finance new capacity. This debt is government guaranteed and is beginning to have an effect on the country's credit rating.[184]

International climate mitigation pressure is another stressor on the regime. However, since there are currently no binding international agreements on climate change, this stressor has had little to no effect on the regime. The result is that the government has made announcements on the reduction of emissions and published the 2011 National Climate Change Response White Paper, neither of which is aligned with its other domestic policies. This is true of both its industrial policies and energy policies. Government has also admitted that it will not commit to its emissions to without an international climate deal with that includes financial assistance.[185] The regime continues to make policies without reference to the government's international statements of intent.

---

[181] Newberry, D and Eberhard, A (2008) pp 64

[182] Ibid, pp 4-5

[183] Eberhard, A (2007) pp 232

[184] I-net Bridge, (2011) *Moody's warns of significant Eskom hikes* available at http://www.fin24.com/Economy/Moodys-warns-of-significant-Eskom-hikes-20111111 accessed 24/11/2011

[185] Peters, D (2011) Media statement by the Minister of Energy at the COP17 Media Briefing of 1 December 2011 available at http://allafrica.com/stories/201112020433.html [accessed 20/01/2012]

Paradigm shift

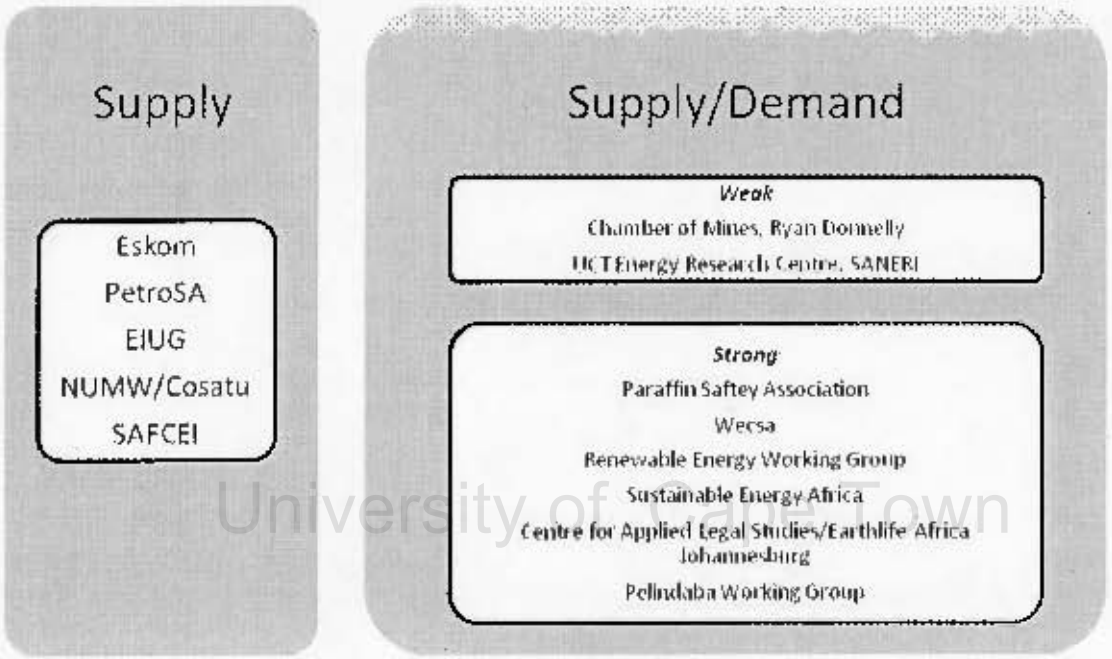
There has been no significant shift away from Marquard's Supply paradigm in South Africa's energy and electricity policy since democratisation, as was demonstrated in chapter 3. However, an analysis of the public participation in parliamentary hearings for new electricity legislation since the 1998 Energy White Paper shows a definite rise in competition between paradigms. Public hearings in the Parliamentary Committee on Public Enterprises on the Eskom Conversion Act (the most significant piece of legislation to come out of the 1998 White Paper), saw two submissions: one from the Department of Public Enterprises and one from trade union federation Cosatu. Both submissions represented thinking in line with Marquard's supply paradigm, focussing on ensuring centralised supply of secure electricity.[186]

The Portfolio Committee on Mining and Energy, while considering the 2008 National Energy Bill, received 18 submissions in public hearings, representing a marked increase in public interest in energy policy. Of the 18 submissions, 17 could be specified in terms of Marquard's paradigms. Six of the 17 fall into Marquard's Supply paradigm, these submissions are from Nersa, Eskom, the Energy Intensive Users' Group, state owned liquid fuels company PetroSA and the Southern African Faith Communities Environment Institute (SAFCEI). The latter is the only surprising submission in this category. While the SAFCEI submission advocated the use of renewable sources of electricity, it did so only to address an increase in supply to meet growing demand and maintained the necessity of lowest possible cost. The remaining eleven all fell into Marquard's Supply/Demand paradigm. Five of these were in the Supply/Demand paradigm in the weak sense, only advocating increased regulation with respect to demand side mitigation and energy efficiency. Of these submissions, two came from civil society, one from an academic research unit, one from a private

[186] Parliamentary Monitoring Group (2001) Eskom Conversion Bill Public Hearings available at http://www.pmg.org.za/minutes/20010508-eskom-conversion-bill-public-hearings accessed 31/10/2011

citizen and one from a government agency, the South African National Energy Research Institute (established in 2004 and responsible for public interest energy research).[187] The remaining six submissions were strong examples of the Supply/Demand paradigm, demonstrating some consideration of end use of energy or energy service requirements in supply choices. These all came from civil society organisations, including non-governmental organisations (NGOs).[188]

Figure 1: Responses to 2008 NEB



The latter six submissions mentioned above signal the emergence of a rival energy paradigm seeking to participate in South African energy and electricity policy making. It seeks the use of renewable energy for electricity supply and other energy services as well as increased efficiency in South Africa's energy usage. This rival paradigm exists predominantly among civil society, and particularly among environmentally directed civil society organisations, which represents a small portion of South Africa's population. There is limited cohesion in their submissions, suggesting a lack of organisation amongst subscribers to the paradigm. This lack of cohesion combined with limited popular support suggests little power to influence policy making at this stage. Limited

[187] SANERI. South African National Energy Research Institute (Pty) Ltd. Available at http://www.saneri.org.za/index.html [accessed 20/10/2011]

[188] See appendix one

participation by supply paradigm adherents -- limited to a union federation, state enterprises and an intensive users' lobby group -- also suggests limited concern within the hegemonic supply regime about new competitors.

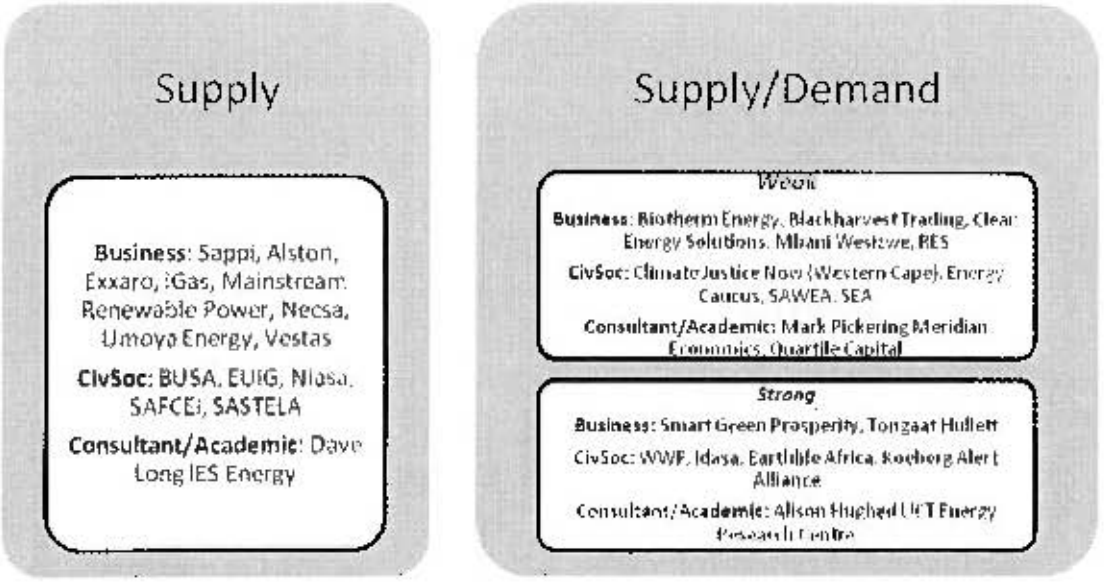
Public participation in the IRP2010 increased significantly from previous policy processes. Some 200 participants from civil society, business, academic and private citizens were consulted in the drafting processes.[189] The policy was drafted by the Department of Energy's Technical Task Team, the composition of which is outlined in the previous chapter.[190] Thirty-two submissions were made to a public preliminary plenary hearing to Parliament's Energy Committee. At the plenary hearings 15 submissions were made by business, 13 by civil society organisation and lobby groups, and four by academics, private individuals and consultants. Of the business group, eight made submissions in the Supply paradigm, with the remaining seven submissions falling in the Supply/Demand paradigm; five were weak and two were strong. Of the eight companies petitioning in the Supply paradigm, three were renewable energy advocates, seeking a Supply paradigm with renewable electricity, two were private nuclear providers; there was one submission each from a mining firm, a liquid natural gas firm, and a paper firm. All seven of the firms in the Supply/Demand paradigm were either renewable energy and electricity providers or marketers of energy efficiency products. Amongst civil society, NGOs and lobby groups making submissions, five were in the Supply paradigm: these were business lobby groups, Business Unity South Africa (BUSA), the EUIG, nuclear association Niasa, the Southern Africa Solar Thermal and electricity Association and SAFCEI. The remaining eight submissions were a divided four and four into strong and weak version of the Supply/Demand paradigm: a wind energy lobby group, four environmentally focussed NGOs, a governance NGO and two civil society organisations. Of consultants and

[189] Department of Energy (2011) IRP2 public hearing outcomes. Available at http://www.pmg.org.za/report/20110126-department-outcomes-irp2-public-hearings-briefing accessed 13/08/2011.

[190] Idasa (2010) Submission to Public Hearing available at http://www.energy.gov.za/IRP/irp%20files/IDASA_CPT.pdf accessed 31/10/2011

academics, three made cases for in the Supply/Demand paradigm, one of which was strong, while an energy consultant made a case in the supply paradigm.[191]

Figure 2: Responses to IRP 2010, Preliminary Plenary Hearing



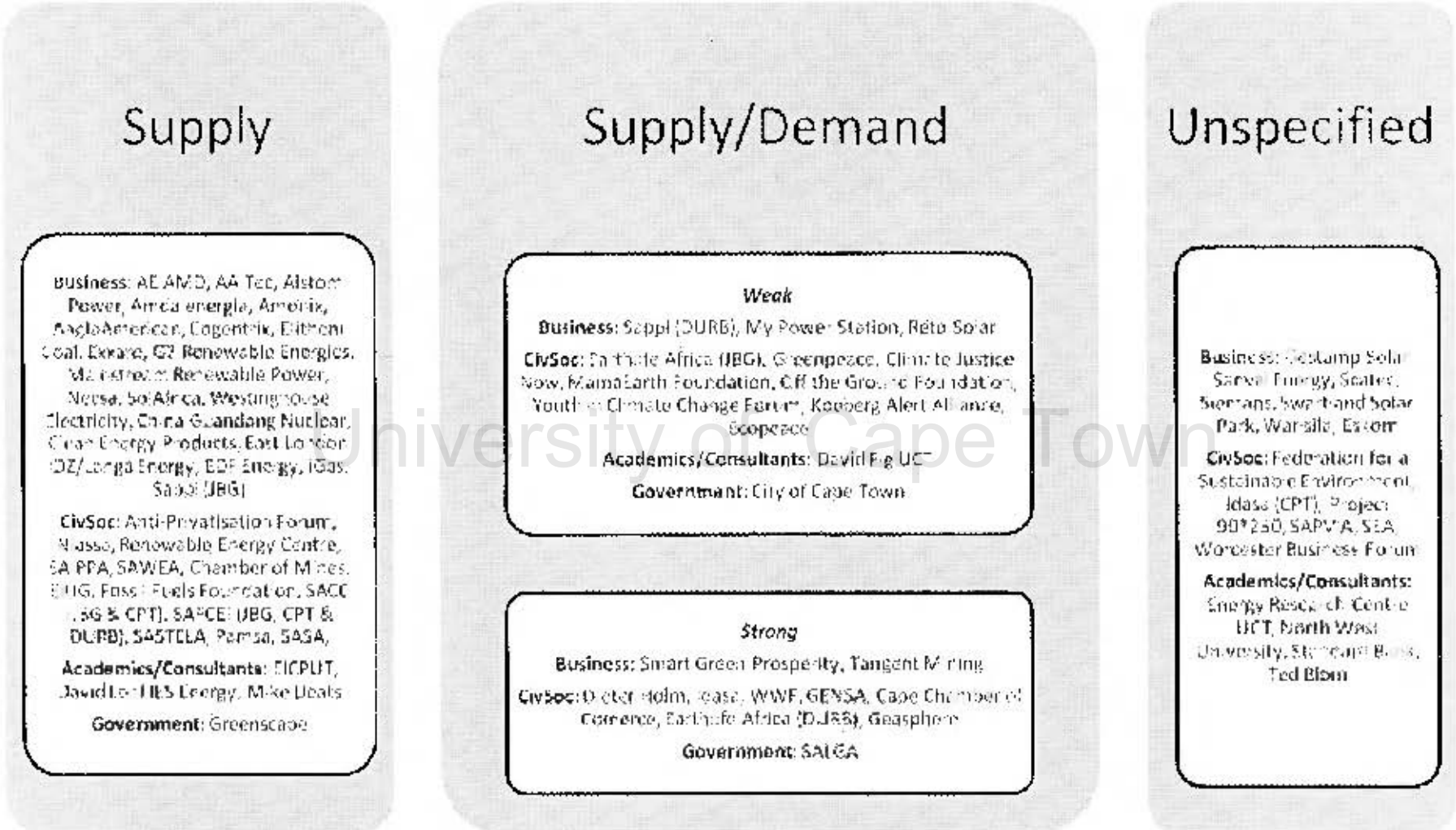
Subsequent to the redrafting of the IRP 2010, 81 public submissions were made in public hearing to the parliamentary committee on energy. Of the 81 submissions 35 were made by businesses and government affiliates, 37 by civil society, NGOs and lobby groups, nine by academics and consultants. Of the 35 business and government submissions, 21 were in the Supply paradigm and eight in the Supply/Demand paradigm (six were not specifiable either through inaccessibility or because the submissions did not address specifiable issues). In the Supply/Demand paradigm five were weak and three were strong. However, of the business submissions 14 came from companies offering renewable energy services or marketing energy efficiency products and of these nine made submissions in the Supply paradigm. Of civil society, NGOs and lobby groups 16 made submissions in the Supply paradigm, while 15 made submissions in the Supply/Demand paradigm and (six were not specifiable). Of those in the Supply/Demand paradigm six were in the weak paradigm and nine were strong. The 16 in the Supply paradigm included anti-privatisation groups, nuclear industry lobby groups, paper industry lobby groups, energy users lobby groups, mining lobby groups, and

[191] See appendix 2

some renewable energy advocates. Of the nine academics and consultants who made submissions, four submissions fall into the Supply paradigm, and one in the Supply/Demand paradigm (weak), (four were non-specifiable).[192]

[192] See appendix 3

Figure 3: Responses to iRP2010 Energy Committee



These results demonstrate that there is an alternative Supply/Demand paradigm with growing support; it still lacks majority support sufficient to unbalance the dominant Supply paradigm. Its emergence has occurred at the same time as an increase in public support for its rival Supply paradigm -- previously unchallenged in early post apartheid energy and electricity policy-making. Additionally, several firms, lobby groups and consultants made cases in the Supply paradigm but with an emphasis on nuclear as a basis for supply, or new generation capacity instead of coal. This suggests the emergence of a second rival paradigm to the cheap coal based electricity supply paradigm supported by the hegemonic regime.

While support increased for a Supply/Demand paradigm, this has been mainly amongst civil society organisations and NGOs. There is little evidence of support for such a paradigm in government or big business. Even firms that are seeking to be renewable energy providers seem to have a preference for a Supply paradigm. The reason for this is unclear, but perhaps they prefer an electricity-dominated sector to ensure a big market, as opposed to a efficient and end use based system. Academics appear split on which paradigm is preferable, suggesting that the Supply paradigm has not been sufficiently undermined by intellectuals for there to be a significant paradigm shifts. The split is not based along fields of study, as might be expected, with economists on one side showing preference for a supply paradigm that can maintain cheap energy and energy specialists on the other side arguing for a Supply/Demand paradigm. It is not so simple, energy specialists are divided, with the UCT Energy Resource Centre advocating a Supply/Demand paradigm while the Energy Institute at the Cape Peninsula University of Technology advocating the Supply paradigm. Within government, advocates for the Supply/Demand paradigm are limited to local government and research agencies with little policy-making power.

Support for the rival emerging nuclear-based Supply paradigm is centred among large electricity users, Eskom, potential nuclear suppliers, such as Westinghouse, and consultants with Eskom links.

such as Mike Deats, a former executive director at Eskom, who called for in excess of 15 000 MW of nuclear capacity to be built through the IRP 2010.[193] Outside of the parliamentary hearings, former Eskom chairman Bobby Godsell has said that it is necessary to build nuclear capacity of 20 000 MW through the IRP 2010.[194] Despite the growing strength of this rival paradigm, its influence remains limited, with little commitment from the government to nuclear builds.

The intellectual credibility of the Supply paradigm, therefore remains significant, while its opposition remains fragmented, undermining the strength of a Supply/Demand paradigm. The emerging paradigm is also threatened by a rival nuclear Supply paradigm, which additionally has significant potential to absorb support of the coal driven Supply paradigm. As business has a preference for significant base load supply to ensure security of supply, this group may shift more toward the nuclear Supply paradigm. Eskom, which has the most to gain from supply choices that will require large state investment and high levels of security, could shift allegiance toward a nuclear Supply paradigm and away from coal.

Legitimacy crisis

Despite being subject to five significant stressors, the cheap electricity Supply paradigm has not faced a significant legitimacy crisis. Wilson argues that a regime experiences a legitimacy crisis when there is a widespread popular loss of confidence in the regime's ability to solve policy problems. This is usually the result of exploitation of stressors by political leaders intent on policy change.[195] This challenges the rationality of the existing regime through expanding the issue and capturing media attention, shifting debate away from the policy arena, to alternative forums. This is

193

Deats, M (2010) Presentation on the IRP2010. Available at http://www.energy.gov.za/IRP/irp%20files/MIKE_DEATS.pdf accessed 26/01/2012

194 Godsell, R (2010) in Helen Suzman Foundation Quarterly Roundtable series, September 2010, Volume 17.

195 Wilson, C (2000) pp 264.

typically led by political leaders outside the government.

The stressors experienced by the dominant cheap electricity for economic development regime have typically been threats to the electricity sector's ability to supply electricity to industry. At least this is the case within South Africa. There is significant international pressure on the state to make policy changes to limit emissions, however, to a large extent South Africa has been able to hide from this pressure through its status as a developing country. Pressure within the country has been focussed on ensuring security of supply, and particularly security of supply to industry. Some other stress on the regime has been caused by protest against the cost of electricity to poor households. Little stress has come from within the state to reduce carbon emissions, mitigate against climate change and increase sustainability.

Opposition politicians lack significant capacity to harness popular support to challenge regimes politically. The ANC has held, and continues hold, popular dominance, achieving between 69 and 65 percent of votes in all national elections since 1994.[196] There is also only a small measure of capacity within the ANC to challenge a cheap electricity regime internally. The ANC's internal politics is dominated by parties with interests in cheap power, from mining shareholders to mining and metal working labour unions seeking to ensure job security. The ANC is under significant pressure to ensure job creation, which means making any decisions that run against traditional economic strengths is politically difficult. The government's New Growth Path and industrial policies demonstrate that there is little political will within the ANC to change the country's energy system and its electricity regime.

There is little evidence of widespread popular criticism of the sustainability of South Africa's electricity sector; demonstrated by submissions to public hearings. Participants seeking to change

[196] Jeffrey, A (2010)*Chasing the Rainbow* South African Institute of Race Relations, Cape Town. Pp 26-27

the country's electricity paradigm were limited primarily to small civil society groups with limited membership. The largest popular movement to make submission on any of the energy policies was labour union federation Cosatu, whose submissions have been uniformly in the Supply paradigm. South Africa's other significant popular movement is churches which are represented in public hearings by the South African Council of Churches (SACC) and the Southern African Faith Communities' Environment Institute (SAFCEI). Both SACC and SAFCEI's submissions on the Energy Bill and the IRP 2010 advocated a move to renewable electricity production but maintained the need for a centralised affordable electricity supply. Thus these two groups are also categorised in the Supply paradigm, not significantly undermining the existing regime.[197,198,199]

Eskom faces the most pressure as a result of the country's electricity supply crisis. However, as demonstrated in chapter 3, it is not the only member of the dominant regime. The type of political support described by Wilson as necessary to undermine the legitimacy of the regime has not been garnered by the competing regimes but by other members of the dominant regime. Politicians in the leading party and government-- particularly the Department of Economic Development and DTI -- won public attention with policy strategies such as the National Industrial Policy Frameworks, and the follow up Industrial Policy Action Plans and the New Growth Path. These strategies target job creation as the main goal, but support an increase in electricity supply to secure existing heavy industry, hoping to create new and guarantee existing jobs. The strategies pay lip service to the development of a "green economy" where renewable electricity can be supplied into the existing grid and the potential for the production of household efficiency products such as solar water heaters. As demonstrated in chapter 3 the plans aim for development that deepens the economy's electricity intensity.

---

[197] South African Council of Churches (2010) Clean Energy for a Healthy Nation Available at http://www.energy.gov.za/IRP/irp%20files/SACC.pdf

[198] SAFCEI (2008) Public Submission on the National Energy Bill available at http://www.pmg.org.za/report/20080731-public-hearings-national-energy-bill-b52-2008

[199] SAFCEI (2010) Comments on the IRP2010 available at http://www.energy.gov.za/IRP/irp%20files/SAFCEI_JHB.pdf

Therefore, while it is clear that the dominant cheap electricity regime has been put under pressure by a number of stressors, this has not led to a significant crisis of legitimacy in popular terms. Widespread popular support for a change in the electricity regime and the energy paradigm remain a challenge that competing regimes, supporting an alternative paradigm, have not met. The extent of this challenge is exceptionally large, given the dominance of the ANC over popular politics in the country, and its belief that protection of energy intensive industry is necessary for its job creation imperative.

Power shifts

According to policy regime theory, power shifts can manifest in a number of ways, but can be understood primarily as being either internal shifts or external shifts in power. Internal shifts refer to changes within the regime, such as collapses of coalitions, changes in presidency or parliament, and defections of important factions. External power shifts refer to improvements in the positions of competing regimes such as an ability to attract mass support, changes in the abilities of opposition leadership such as its ability to attract funding, support build coalitions, expand issues and access the media and exploit stressors and enablers. A shift in power in an external sense would demonstrate the competing regime's ability to undermine the legitimacy of the dominant regime through widespread public persuasion. [200]

In terms of internal power shifts, the South African experience has been limited since 1994. The change in political power in 1994 was marked by the inclusion of the ANC into the existing regime, on the agreement that Eskom would expand public access to electricity. Further politically-driven attempts to make changes in the regime have seen limited success. The reorganisation of the

[200] Wilson, C (2000), pp 264

distribution industry from municipalities to regional electricity distributors was abandoned, under pressure from the treasury and the municipalities.[201] Attempts to create an independent systems and market operator responsible for the transmission and acquisition of electricity has been legislated but not finalised at the time of writing, despite the fact that the policy process to make this change began in 1997.[202] This move has been largely resisted by Eskom, whose monopolistic control of the electricity industry is threatened by the separation of the generation and transmission industries.

Changes in presidency over the period have not resulted in dramatic changes in policy and have been limited to changes in the head of the party. Economic policies from the RDP, through GEAR, Asgi-SA and the latest New Growth Path have sought to deepen the country's industrialisation in pursuit of economic development and thereby deepen its electricity intensity and dependency on its comparative advantage in cheap electricity. There is relative stability within the ruling party and its allies, Cosatu and the South African Communist Party. Disputes emerged primarily over the means of deepening the country's industrialisation. Eskom remains state owned despite being corporatised, and the government still views electricity intensive industry as its best source of potential growth, as in demonstrated in its industrial policy. Furthermore the make-up of the Department of Energy's Technical Task Team, outlined in the previous chapter, shows that policy decision making power in the electricity industry is still firmly located within government, Eskom and big business. Government, Eskom and members of the EUIG dominate the task team with only limited representation by consultants and academics.[203]

Clearly, the electricity policy power arrangements remain a significant challenge to competing policy regimes in the South African energy and electricity sector. While there have been some internal power shifts -- particularly just after democratisation -- this has not translated to a reduction

201 Newberry, D and Eberhard, A (2008) pp 64
202 Eberhard, A (2007)
203 Idasa (2010) Submission to Public Hearing available at http://www.energy.gov.za/IRP/irp%20files/IDASA_CPT.pdf accessed 31/10/2011

in power in the dominant regime or an increased ability to create power in competing regimes. The alliance between government, the ANC and business is based on a mutual interest in growth and economic development. The alliance between the ANC and Cosatu remains strong based on a mutual interest in job preservation. The links between Eksom and government remain strong, with Eskom dominating the policy making process in alliance with big business, and making policy decisions in favour of a Supply paradigm based system. There have been only limited internal power shifts. There is no demonstration of competing regimes' ability to gather power either.

There is little demonstrable mass support for alternative electricity paradigms, with both major mass participation organisations -- unions and the churches -- preferring Supply paradigm policies in their responses to electricity policy documents. The legitimacy of the existing regime remains intact despite its exposure to significant stressors.

Organisational and policy change

The final element of policy regime change is organisational and policy change. Change in organisations that implement policy and implementation of policy changes demonstrate a change of policy regime. This occurs through either the establishment of a new or former regime or the internal reorganisation of the dominant regime.[204]

There has been some change in organisations that implement South Africa's electricity policy. The NER was established, and then became NERSA. While providing a legitimate body for the regulation of the sector, it remains under-resourced, particularly in terms of personnel and information. SANERI was established to deepen research into the sector, but its output remains limited and its mandate has been confused by the establishment of SANEDI. Government chose not

[204] Wilson, C (2000) pp 265

to establish the proposed National Energy Modelling and Information Agency, preferring to allow Eskom to continue to be the primary electricity information source for NERSA. This decision entrenches the location of energy planning in the DOE and separates it from any additional research and data collection body.[205]

The other significant organisation changes have been the corporatisation of Eskom and the decision to establish an ISMO. The corporatisation of Eskom has done little to change the operations of the institution. It remains wholly publicly owned and almost exclusively responsible to the generation and transmission of electricity. The decision to establish an ISMO marks the most significant organisational change since democratisation, and the most significant threat to the power of Eskom. It is the necessary precursor to the introduction of private electricity generators into the electricity market. In this sense, it provides the most likely way to introduce renewable energy into South Africa's electricity market, giving independent power producers an unbiased client to sell to. However, the establishment of an ISMO does not undermine the regime as it remains in the Supply paradigm, with Eskom likely to remain the dominant power supplier because of its established infrastructure and access to government guaranteed finance. Without a predictable Renewable Energy Feed-in Tariff, an ISMO will continue to favour cheap electricity producers over renewable electricity producers, and renewable electricity producers will be reluctant to enter the market.[206] The ISMO does not present a challenge to the preference for electricity over energy decisions based on end use.

In terms of policy change, it is demonstrated in Chapter 3 that there has been little change on the paradigmatic level since democratisation. There has been a gradual acknowledgement of the need to introduce renewable energy into the electricity mix, but there has also been a re-entrenchment of the need for energy security, based on fossil and nuclear fuels, and that changes should not threaten

[205] Tyler, E (2009) pp 12-13
[206] Trollip, H et al (2010) pp 7

potential for economic development and industrialisation. A comparison of the policies to the DOE's strategic plans and its annual budgets show that expenditure on change has been limited, suggesting limited implementation.

The Department of Minerals and Energy's first strategic plan for 2000/01 to 2003/04 focused (on the energy side) on the implementation of the 1998 Energy White Paper. It sought to gradually introduce solar and wind power into the electricity system, alongside the implementation of the National Electrification Programme and the restructuring of the distribution industry.[207] However, the annual report of the Department of Minerals and Energy for the 2003/2004 financial year shows no expenditure on renewable electricity development, acknowledging this is the source of its appropriation underspend.[208] The Eskom annual report for the same period shows renewable energy expenditure as limited to demonstration plants and accounted for along with demonstration plants of other forms of electricity production.[209]

The 2006/7 to 2010/11 strategic plan acknowledges the need for new generation capacity and establishes the time frames for the Integrated Research Plan but states no preference for renewable electricity but it calls on the regulator to license renewable energy providers. The strategic plan contains a suggested mid-term review of the 2003 Renewable Energy White Paper and makes financial provision for the use of consultants in doing so, but does not plan any expenditure on renewable energy.[210]

The 2007/08 to 2009/10 strategic plan establishes objectives for efficiency measures and the introduction of alternatives fuels, but set out very limited actions in response to these, such as

---

207 Department of Minerals and Energy(2000) Strategic plan for the DME 2000/01-2003/04 pp14-16
208 Department of Minerals and Energy (2004) Annual Report 2003/2004 pp 83-95
209 Eskom (2004) Annual Report 2003/04 pp 122
210 Department of Minerals and Energy (2006) Strategic Plan 2006/2007 pp 51-63

creating awareness and widening access to LPG as a household fuel.[211] The department's annual report for the 2009 financial year also makes no financial provision for renewable energy. It makes provision for Eskom's National Electricity Response Team, which coordinates the short-term response to the supply crisis, as well Eskom's Energy Efficiency Demand Side Management project, which is primarily based on publicity drives targeting voluntary conservation, as widespread switch to efficient lighting, with limited industrial savings.[212]

The 2008/09 to 2010/11 plan highlights the need for energy diversification but prioritises the economy in energy policy making. It allocates subsidies to renewable energy projects to be spent across the period and seeks to ensure electricity security, but also promote demand management. However, action in these areas is limited to raising awareness.[213] By the 2010/11 financial year the department increased its annual spending on clean energy subsidies and transfers to R 350 million, but spent R 2.9 billion on electrification.[214]

In late 2011, the government published its National Climate Change Response White Paper. The purpose of the white paper is to manage a national transition to a low carbon and climate change resilient economy, and to make a 'fair' contribution to international emissions reduction.[215] The strategy of the white paper is to prioritise measures with the greatest combined mitigation and adaptation capabilities, particularly those with job creating, poverty alleviating features and the lowest cost to business and the economy.[216] Its primary focus is policy that will lead to climate change resilient development.[217] It acknowledges the importance of its integration across national policies, particularly in the IPAP and the IRP, but was only published after these were established,

---

211 Department of Minerals and Energy (2007) Strategic plan 2007/08-2009/10 pp 76-94
212 Department of Minerals and Energy(2009) Annual Report 2009 pp 174
213 Department of Energy (2008) Strategic Plan 2008/09-2010/2011 pp 73-88
214 Department of Energy (2011) Annual Report 2010/2011 29-31
215 Department of Environmental Affairs (2011) National Climate Change Response White Paper pp 11
216 Ibid, pp 14-15
217 Ibid, pp 13

decreasing the likelihood of meaningful integration. While the policy is an important acknowledgement of the climate change problem, it marks a very limited deviation from the country's energy and industrial policies. Development and poverty alleviation are prioritised over adaptation and particularly over mitigation. It does not represent a significant policy change or threat to the industrial supply energy policy regime.

Additionally, in November 2011 the government's National Planning Commission released its National Development Plan. This document outlines the government's long-term plan for development until 2030. Its priority is to reduce poverty, unemployment and inequality in South Africa by significant levels. It has targeted a reduction in unemployment from 27% to 6 % by 2030[218] and outlines the economic interventions and outcomes needed to achieve this outcome. Through this it addresses the energy needs of the economy. It acknowledges both the need to increase supply and increase the use of renewables in electricity production. It identifies the need to build 40 000 MW of new generating capacity and proposes that 20 000 MW of this should be from renewable sources (it is unclear whether this includes nuclear power).[219] It also seeks to achieve 95% electrification to household by 2030.[220] However, it also identifies the need for significant demand side mitigation measures,[221] but these are mostly seen as measures to reduce carbon emissions, not as an alternative to increasing energy supply.

The National Development Plan demonstrates some deviation from previous policy, particularly in its approach to expanding South Africa's manufacturing sector. But it still envisions a Supply paradigm energy system and preferences electricity of other energy sources, particularly in the minerals sector and for households. It makes extensive provision for renewable power and for the role of independent power producers, deepening the government's commitment to an independent

218 National Planning Commission (2011) National Development Plan: Vision for 2030 pp 28
219 Ibid, pp 153
220 Ibid, pp 153
221 Ibid, pp 32

system and market operator, but prioritises electricity as an energy choice.

Clearly there has been an increase in attention for energy efficiency and renewable energy in establishing ideal policy outcomes. This has not been met with action or concrete measures to achieve these outcomes. The key actions of strategic plans are severely limited in their scope and implementation, as demonstrated by their lack of budgetary support from the department and from Eskom. While there has been some policy and organisational change, it has not resulted in a change in the regime. Changes in policy have been exclusively incremental, such as the planned incorporation of renewable electricity into the electricity mix. Changes in policy have also aimed at the development of new policies and institutions, such as the creation of NERSA, but do not demonstrate a change in the policy paradigm. Further while the policies seek to integrate with each other the chronology of their development suggests that this will be difficult to achieve, particularly as supply decisions, made through the IRP 2010, have been made prior to the decisions on emissions reduction and renewable energy industry support in the Climate Change White Paper and National Development Plan. The decision to adopt the ISMO will change power relations to a limited extent within the regime, but it remains a cheap industrial electricity supply regime.

The challenges to overcoming the cheap industrial supply regime are therefore located across the pillars of regime change. While there have been significant stressors on the regime these have not been effectively used by opponents. The legitimacy of the regime and its paradigm remains largely unchallenged in the widespread public discourse, with only small, if vocal, constituency opposing it. Despite some first and second order policy change, there has been no third order policy change to demonstrate a shift in paradigm of the regime. Organisational changes have lead to a small power shift within the regime, away from Eskom, but this has not threatened the paradigm that underpins the regime. The challenge to overcoming this regime then remains primarily in the need expand support for a competing Supply/Demand paradigm in a way that can undermine the legitimacy of

the dominant regime, and force a power shift away from it.

Chapter 5

Conclusion

Using policy regime theory as a means to better understand South African electricity policy provides helpful insight into the sector. A strong coalition has formed around the issue of cheap, secure, centralised and coal driven electricity and dominates policy. This coalition consists of 1) national government, particularly the Departments of Trade and Industry, Public Enterprises, Minerals and Energy and the Treasury, 2) state owned electricity company Eskom and 3) energy intensive industry, most visibly in the form of the Energy Intensive User Group, whose members both individually and collectively seek to influence policy. The motives of each member of the coalition's participation in the group are different. Government has demonstrated it believes cheap electricity is necessary to underpin growth and development in the South African economy, which it believes can best be achieved through industrialisation. This will deepen South Africa's dependence on electricity. Eskom is interested in retaining control over South Africa's electricity industry, particularly the generation of electricity and all of its current generation infrastructure. Industry in South Africa is particularly energy intensive and it is interested in maintaining cheap and secure supply to ensure competitiveness.

While the motives of the participants in the regime differ, their interests in electricity policy function in a single policy paradigm -- described by Marquard as the Supply paradigm -- which is rooted in the belief that solutions to energy problems are resolved in the long term by an increase in energy supply. In South Africa, given the nature of the energy sector -- where electricity is dominant -- the paradigm can be applied to electricity specifically. This paradigm describes the belief that energy supply should be increased to meet demand as it rises, and that demand mitigation should be a temporary measure to reduce demand in times of a supply shortage. The examination of specific electricity policy documents in Chapter 3 illustrates that the policy regime is located in the supply

paradigm. Some academics, notably Tyler and Marquard, have observed that the policies are beginning to shift towards Marquard's Supply/Demand paradigm. However, this study argues that while there are some creeping elements of the Supply/Demand paradigm, the policies remain fundamentally located in the Supply paradigm.

With the dominant regime located in the Supply paradigm, the road to reform in the electricity industry will be a long one. In order for significant policy change to occur, competitors to the dominant regime must capitalise on stressors, which impact the existing system. Only by capitalising on the stressors, undermining legitimacy, and changing its power arrangements policies and organisations will the dominant paradigm be undermined. Despite significant stress on the South African electricity system which threatens the dominant policy regime -- such as equitable access to electricity, political pressure for structural reform, a supply crisis and its financial implications and international climate pressure – the balance of power has not been significantly disrupted to result in regime change.

Opponents of the cheap electricity Supply Regime have failed to undermine the intellectual position of the dominant regime. Among participants in policy processes, advocates of the Supply Regime remain more numerous and better coordinated. Supporters of a significant alternative paradigm remain uncoordinated and divided between weak and strong versions of the paradigm. A competing alternative Supply Regime based on supply security through increased nuclear capacity has created competition amongst competing regimes. This regime, however, remains in its infancy, with little government commitment to new nuclear build, without a commitment in the National Development Plan and the potential threat of safety concerns following failures at Japan's Fukushima plant. Support for the Supply/Demand paradigm is lower than anticipated.

While many participants in the public policy process sought the introduction of more renewable

electricity, many of these remained in the Supply paradigm as they did not advocate end use consideration of energy choices or long-term energy efficiency and demand side mitigation. Included in this group, are many of the renewable electricity producers, a group that one would assume has a preference for a change in the paradigm, and religious civil society, the civil society group with the greatest potential to mobilise mass support for change. Opinion amongst academics, both energy experts and economists, varies between the maintenance of a coal based cheap electricity industry in the Supply paradigm and a sustainable climate mitigating system in the Supply/Demand paradigm. The Supply paradigm has, therefore, not been wholly overturned by the intelligentsia in the policy area.

Lack of widespread support for paradigm and regime change means the legitimacy of the regime in has not been significantly undermined. While the supply crisis puts Eskom under significant stress, the opportunity to capitalise on this has not been harnessed effectively by political or regime opposition. The political dominance of the ANC hampers the ability for opposition parties to harness widespread popular support for change. The limited opposition from civil society to the Supply paradigm, particularly amongst the churches and the unions, has further limited opposition capacity to harness support.

While there have been some power shifts within the dominant regime these have been limited to the shifting of capacity within the regime to make electricity policy and control over electricity infrastructure, from Eskom towards government. It has led to some policy change, improving regulation of the industry and attempts to allow private generators equitable access to the electricity transmission grid. Power shifts within the regime have not changed the paradigm of the regime; this limits the extent to which policy will change. There have been no significant power changes external to the regime, and these remain unlikely given the dominance of the ANC and electricity intensive industry over South Africa's politics and economics. It seems likely that the most

significant potential threat to the current power arrangements is international pressure for climate change mitigation and this would be dependent on the outcomes of international climate negotiations.

In the 1994 to 2011 period there has been some organisational and policy change: corporatisation of Eskom, improvement of the regulatory regime, widespread electrification and moves to gradually introduce privately generated power and renewable power into the system. The industry regulator remains fairly weak, as do other new energy research institutions; the introduction of private producers has been limited and heavily resisted by Eskom; spending on renewable electricity, efficiency and demand side mitigation remains limited. There is a lack of clarity and consensus over the nature of power purchasing agreements with private players, as well as with the renewable energy feed in tariff for private renewable power producers. While there has been some change, it remains solely first and second order policy change, not third order change, and therefore remains firmly located in the Supply paradigm.

Therefore, the dominant coal base cheap secure electricity regime in the Supply paradigm is a significant barrier to policy change in the South African electricity system. It remains powerful, popularly legitimate and in control of policy decisions, despite significant stress having been placed on the regime and its electricity sector.

Limitations

The limitations to this thesis are found primarily in its depth and the documents to which it has had access. In terms of depth, the limitations come through the need to study a number of factors in a relatively small space. In order to establish the nature of the barrier to regime change, the study needed to take into account stressors and enablers, paradigm changes, power changes, legitimacy

and organisational and policy changes, each of which would normally merit their own chapter. The same problem occurs in establishing the nature of the regime, where the power arrangements, paradigm and policies each merit their own chapter and individual study. The consequence of this is the limited extent to which each of these factors can be examined individually. I have given primary attention to paradigms and paradigm shifts, which I consider the most important element underpinning the regime and potential policy change. This limitation also places a limit on the methods used; further studies could be done with a more direct focus on each factor allowing more rigorous methods in each area.

Another limitation has been the availability of appropriate documents. Attempts to access public submissions on the 1998 and 2003 White Papers through the Department of Energy were unsuccessful, as were attempts to access public submissions to the Departmental Technical Task Team prior to the drafting of the IRP 2010. I have therefore been limited to documents and minutes of parliamentary business available on the Department of Energy website (in the case of the IRP 2010) and through the Parliamentary Monitoring Group. Unfortunately, the Parliamentary Monitoring Group does not have records of submissions on the two White Papers, which determined the need to look at the submission on the Eskom Conversion Bill and the National Energy Bill. The implication of this is that this paper has dealt primarily with the legislative rather than executive policy making process, particularly in its analysis of public hearings. These represent the legislative response to executive policy making, with information on direct the direct executive consultation process being unavailable.

Areas for further research

The application of policy regime theory to the South African case in other areas of policy has the potential to provide useful insights. Analysis of South Africa's industrial policy using policy regime

theory would be an interesting and worthwhile study, especially given the influence of industrial policy on the country's electricity policy. There also need for expansion of the literature on policy making outside the developed world. The theory of policy making in the developing world is relatively limited compared theory on policy making in the developed world. Further case studies and applications of existing theory on policy making in the developing world would be useful in building this literature.

In terms of South Africa's energy policy, there is a need for research on popular support for climate change mitigation strategies in order to better understand the potential for a legitimacy crisis undermining the existing regime, whether through the ANC or through opponents harnessing popular sentiment. The government White Paper on Climate Change is being prepared at the time of completing this study and further research on the response to the public's input could indicate the extent to which the government will move on the issue. Government is due to release its Integrated Energy Plan, which ideally should have been released prior to the development of the IRP 2010. A study of this policy, once released, and its comparison to previous energy policies, such as the 1998 white paper, will give further insight into change in South Africa's energy paradigm and dominant regime.

In contrast to this, further research is needed on high value public procurement of nuclear electricity. The literature on nuclear electricity procurement needs to be developed, given its expected inclusion in South Africa's future electricity generating capacity. It is a particularly expensive and secretive area of public procurement, given the dangers it carries, and is therefore highly susceptible to corruption.

There is also room for a comparative study in developing world energy policy, particularly the major developing economies such as China India, Brazil and South Africa. Such a study could

compare how policy is made in these countries, revealing their energy paradigms and potential for change. This could be particularly useful in understanding their strategies at international climate change mitigation negotiations.

List of References

ANC (1994) Chapter 2, *The Reconstruction and Development Programme: a policy framework.* Umanyano Publications, Johannesburg.

Barkenbus, J (1982) Federal Energy Policy Paradigms and State Energy Roles in *Public Administration Review* 42, 5 pp 410-418

Bond, P and Hallowes, D (2002) The Environment of Apartheid Capitalism in Bond, P, *Unsustainable South Africa, Environment, Development and Social Protest.* University of Natal Press, Pietermaritzburg.

Cobb, R and Elder, C (1983) *Participation in American politics: the Dynamics of Agenda Building.* John Hopkins University Press, Baltimore.

Conradie, S and Messerschmidt, L (2000) *A Symphony of Power:The Eskom Story.* Chris Van Rensburg Publications (Pty) ltd, Johannesburg.

Consulting Engineers South Africa (2010) *Termination of the Electricity Distribution Industry.* Available at http://www.cesa.co.za/node/117 [accessed 15/07/2011].

Creamer, T (2011) *Manufacturing jobs vulnerable to yet more power price increases.* Available at http://www.engineeringnews.co.za/article/manufacturing-jobs-vulnerable-to-yet-more-power-price-increases-2011-09-27 [accessed 19/09/2011]

Davis et al (2008) The Impact of Free Basic Electricity on Energy Choices in Low Income Households: A Case Study in South Africa. PESD working paper #80 available at http://iis-db.stanford.edu/pubs/22331/WP_80._Davis_Hughes_Louw,_FBE_in_South_Africa.pdf [accessed 16/09/2011]

De Oliveira, A and Girod, J (1990) Energy diagnosis: Toward a policy-oriented approach for energy planning in developing countries in *World Development,* 18, 4, pp 529-538

Deats, M (2010) Presentation on the IRP2010. Available at http://www.energy.gov.za/IRP/irp%20files/MIKE_DEATS.pdf accessed 26/01/2012

Department of Energy (2011) Integrated Resource Plan for Electricity 2010-2030

Department of Energy (2011) Annual Report 2010/2011

Department of Energy (2008) Strategic Plan 2008/09-2010/2011

Department of Energy (2011) IRP2 public hearing outcomes. Available at http://www.pmg.org.za/report/20110126-department-outcomes-irp2-public-hearings-briefing accessed 13/08/2011.

Department of Energy (2011) Independent System and Market Operator Establishment Bill

Department of Energy, (2010) Integrated Resource Plan for Electricity Draft

Department of Environmental Affairs (2011) National Climate Change Response White Paper

Department of Minerals and Energy (1998) White Paper on the Energy Policy of the Republic of South Africa

Department of Minerals and Energy (2003) White Paper on the Renewable Energy Policy of the Republic of South Africa

Department of Minerals and Energy (2000) Strategic Plan for the DME 2000/01-2003/04

Department of Minerals and Energy (2004) Annual Report 2003/2004

Department of Minerals and Energy (2006) Strategic Plan 2006/2007

Department of Minerals and Energy (2007) Strategic plan 2007/08-2009/10

Department of Minerals and Energy (2009) Annual Report 2009

Department of Trade and Industry (2007) A National Industrial Policy Framework

Department of Trade and Industry (2007) Implementation of Government's National Industrial Policy Framework: Industrial Policy Action Plan.

Department of Trade and Industry (2010) 2010/2011-2012-2013 Industrial Policy Action Plan.

Department of Trade and Industry (2011) Government and manufacturing circle form a working group to speed up key issues in the Industrial Policy Action Plan (IPAP)and New Growth Path. Available at http://www.info.gov.za/speech/DynamicAction?pageid=461&sid=20940&tid=40257 [accessed 01/10/2011]

Eberhard, A (2007) The political economy of power sector reform in South Africa in Heller, T and Victor, D (eds) *The Political Economy of Power Sector Reform,* Cambridge University Press, Cambridge.

Eskom Convesion Act (2001)

Eskom (2006) Multi-Year Price Determination of Eskom from 1 April 2009 to 31 March 2012: First Consultation Paper. Available at http://www.nersa.org.za/Admin/Document/Editor/file/Electricity/Consultation/Documents/Eskom%20MYPD%20April%202009%20-%20March%202012.pdf [accessed 16/09/2011]

EIUG. The Energy Intensive Users Group of Southern Africa. Available at http://www.eiug.org.za/about/ [accessed 20/09/2011]

EIUG. EIUG Membership. available at http://www.eiug.org.za/membership/ [accessed 20/09/2011]

Eskom (2004) Annual Report 2003/04 pp 122

Fine, B (2008) *The Minerals-Energy Complex is Dead: Long Live tha MEC* Amandla! Colloquium. http://eprints.soas.ac.uk/5617/ [accessed 01/07/2011]

Fine, B and Rustomjee, Z (1996) *The Political Economy of South Africa: From Minerals-Energy Complex to Industrialisation.* Witswatersrand University Press, Johannesburg.

Greenberg, S (2008) Market liberalisation and continental expansion: The repositioning of Eskom

in post apartheid South Africa in McDonald, D (ed) *Electric Capitalism: Recolonising Africa on the power grid.* HSRC Press, Cape Town.

Gillward, A (2009) Good Intentions, Poor Outcomes: Telecommunications Reform in South Africa in *Telecommunications Policy* 29 pp 469-91.

Godsell, R (2010) in Helen Suzman Foundation Quarterly Roundtable series, September 2010, Volume 17.

Habib, A and Padayachee, V (2000) Economic Policy and Power Relations in South Africa's Transition to Democracy in *World Development* 28, 2. pp 245-253.

Hall, P (1993) Policy Paradigms, Social Learning, and the State: The Case of Economic Policy making in Britain in *Comparative Politics* 25, 3 pp 275-296.

Ham, C and Hill, M (1984) *The Policy Process in the Modern Capitalist State.* St Martin's Press, New York.

Handley, A (2005) Business, government and economic policymaking in the new South Africa, 1990-2000 in *Journal of Modern African Studies* 43, 2. pp 225-228.

Hartley, W (2010) Government shuts regional power distributors in *Business Day* 09/12/2010 available at http://www.businessday.co.za/articles/Content.aspx?id=129092 [accessed 16/09/2011]

Hartnady, C (2010) South Africa's Diminishing Coal Reserves in *South African Journal of Science* 106, 9/10.

Hayes, M (2006) *Incrementalism and Public Policy.* University Press of America, New York.

Heclo, H, (1974) *Modern Social Politics in Sweden and Britain.* Yale University Press, New Haven.

Idasa (2010) Submission on the draft integrated resource plan assumptions. Available at http://toolkits.reeep.org/file_upload/8917_tmpphpdB3lJQ.pdf [accessed 13/09/2011]

Idasa (2009) Conflicting Policies for renewable energy in South Africa. Available at http://www.idasa.org/our_products/resources/output/conflicting_policies_for_renewable/?pid=electricity_governance [accessed 20/09/2011]

Idasa (2010) Submission to Public Hearing available at http://www.energy.gov.za/IRP/irp%20files/IDASA_CPT.pdf accessed 31/10/2011

I-net Bridge, (2011) Moody's warns of significant Eskom hikes. Available at http://www.fin24.com/Economy/Moodys-warns-of-significant-Eskom-hikes-20111111 [accessed 24/11/2011].

Jeffrey, A (2010)*Chasing the Rainbow* South African Institute of Race Relations, Cape Town.

Jordan, A.G (1981) Iron Triangles, Woolly Corporatism and Elastic Nets: Images of the Policy Process in *Journal of Public Policy* 1, 1, pp 96.

Kingdon, J (1995) *Agendas, Alternatives and Public Policies.* HarperCollins College Publishers, New York.

Konig, T (1998) Introduction: Modeling Policy Networks in the *Journal of Theoretical Politics*, 10, 4.

MacNamara, W (2010) Big push to make sure the power stays on in *Financial Times* April 2010.

Malzbender, D and Kamoto, B (2005) Domestic Electricity Provision in the Democratic South Africa. Paper produced for the Nordic Africa Institute's Conflicting Forms of Citizenship Programme. Available at http://www.acwr.co.za/pdf_files/01.pdf [accessed 16/09/2011]

Manufacturing Circle (2011) *Member companies and representatives.* Available at http://www.manufacturingcircle.co.za/member_companies.html [accessed 01/10/2011]

Marais, H (2011) *South Africa pushed to the limit: The political economy of change.* UCT Press, Cape Town.

Marquard, A (2006) *Origins and Development of South African Energy Policy.* Unpublished PhD Thesis, UCT.

May, P, Jochim, A and Sapotichne, J (2009) Policy Regimes and Governance: Constructing Homeland Security. Paper prepared for 10th public Management Research Association Conference, Ohio State University, October 2009.

Menahem, G (1998) Policy Paradigms, Policy Networks and Water Policy in Israel in *Journal of Public Policy* 18, 3. pp 283-310

Menahem, G (2008) The Transformation of Higher education in Israel since the 1990s: The Role of Ideas and Policy Paradigms in *Governance: An International Journal of Policy, Administration and Institutions* 21, 4. pp 499-526.

National Energy Act (2008)

National Planning Commission (2011) National Development Plan: Vision for 2030

NERSA (2009) NERSA's decision on Eskom's application for an interim price increase available at http://www.nersa.org.za/Admin/Document/Editor/file/News%20and%20Publications/Media%20Releases%20Statements/Media%20Statement%20-%20NERSA%20decision%20on%20Eskom's%20application%20for%20an%20interim%20price%20increase%2025%20June%202009.pdf [accessed 16/09/2011]

NERSA, Reason for Decision: Eskom Holdings Limited: Revenue Application – Multi Year Price Determination 2010/11 to 2012/13 (MYPD2) available at http://www.nersa.org.za/ [accessed 15/07/2011]

NERSA (2007) *Consultation Paper: Eskom Application for Multi-Year Price Determination Rule Changes.* Available at http://www.nersa.org.za/Admin/Document/Editor/file/Consultation%20paper.pdf [accessed 01/10/2011] pp 20.

Newberry, D and Eberhard, A (2008) *South African Network Infrastructure Review: Electricity.* Paper written for the National Treasury and thh Department of Public Enterprises, Government of South Africa. Available at: http://www.gsb.uct.ac.za/files/SAElectricityPaper08.pdf [accessed 09/08/2011]

Parliamentary Monitoring Group (2001) Eskom Conversion Bill Public Hearings available at

http://www.pmg.org.za/minutes/20010508-eskom-conversion-bill-public-hearings accessed 31/10/2011

Peters, D (2011) Media statement by the Minister of Energy at the COP17 Media Briefing of 1 December 2011 available at http://allafrica.com/stories/201112020433.html [accessed 20/01/2012]

Sabatier, P (1988) An Advocacy Coalition Framework of Policy Change and the Role of Policy-Oriented Learning Therein in *Policy Sciences* 21, 2/3, pp 129-168.

Sabatier, P and Wielder, C (2007) The Advocacy Coalition Framework: Innovations and Clarifications in Sabatier, P (ed) *Theories of the Policy Process,* Westview Press, Colorado, pp 189.

SAFCEI (2010) Comments on the IRP2010 available at http://www.energy.gov.za/IRP/irp%20files/SAFCEI_JHB.pdf

Saneri. South African National Energy Research Institute (Pty) Ltd. Available at http://www.saneri.org.za/index.html [accessed 20/10/2011]

Wilson, C. A (2000) Policy Regimes and Policy Change in *Journal of Public Policy* 20, 3, pp 247-274.

True, J. L, Baumgartner, F, Jones, B (2007) Puntuated-Equilibrium Theory: Explaining Stability and Change in Public Policymaking in Sabatier, P (ed) *Theories of the Policy Process,* Westview Press, Colorado, pp 155.

SAFCEI (2008) Public Submission on the National Energy Bill available at http://www.pmg.org.za/report/20080731-public-hearings-national-energy-bill-b52-2008

Skocpol, T (1985) Bringing the State Back In: Strategies of Analysis in Current Research in Evans, P et al (eds) *Bringing the State Back In.* Cambridge University Press, Cambridge.

South African Council of Churches (2010) Clean Energy for a Healthy Nation Available at http://www.energy.gov.za/IRP/irp%20files/SACC.pdf

Szarka, J (2005) Wind power, policy learning and paradigm change in *Energy Policy* 34 pp 3041–3048

Tinto EM and Banda KG (2005) The Integrated National Electrification Programme and political democracy in the *South African Journal of Energy* 16 (4)

Trollip, H and Marquard, A (2010) Prospects for renewable energy in South Africa published by Heinrich Boell Stiftung Southern Africa available at http://www.boell.org.za/web/climate-change-614.html [accessed 13/09/2011]

Tyler, E (2009) Aligning South African energy and climate change mitigation policy. Energy Research Centre, University of Cape Town. Available at http://www.erc.uct.ac.za/Research/publications/09Tyler_Policy_alignment.pdf [accessed 2/06/2011]

Appendix 1

National Energy Bill Public Hearing 30-31 July 2008

Organisation	**primary business**	**Paradigm 1**	**2**	**3**	**4**	**N/A**
Business						
Eskom	state owned enterprise		1			
PetroSA	state owned enterprise		1			
Subtotals						
2		0	2	0	0	
Civil Society/NGOs/ Private citizens/lobby groups						
Paraffin Safety Association	safety lobby			strong		
Wessa	Environmental NGO			strong		
Renewable Energy Working Group	Civil society			strong		
Chamber of Mines	mining lobby			weak		
Electricity Intensive User Group	energy lobby		1			
Sustainable Energy Africa	Sustainable energy NGO			strong		
Centre for applied legal studies/ EarthLife Africa Johannesburg	Legal/Environmental NGO			strong		
National Union of Mineworkers/Cosatu	Union		1			
Pelindaba Working Group	Civil society			strong		
SAFCEI	Church based environmental civil society		1			
Ryan Donnelly	private individual			weak		
Matroosfontein Civic Association	civil society					Inaccessible
South African Climate Action Network	NGO network					inaccessible
Subtotals:						
13		0	3	8		2

				2 weak		
				6 strong		
Academics/Consultants						
UCT Energy Research Centre	Academic research			weak		
Subtotals						
1		0	0	1	0	
				1 weak		
Government bodies						
SANERI	government research body			weak		
Nersa	energy regulator		1			
Subtotals						
2		0	1	1	0	
				1 weak		
Totals						
18			6	10		2
Reference						
All submissions accessed through the Parliamentary Monitoring Group and are available at http://www.pmg.org.za/report/20080731-public-hearings-national-energy-bill-b52-2008						

Appendix 2

IRP 2010 Stakeholder Plenary Session 7-8 June 2010

Business					
Organisation	**Primary business**	**Paradigm 1**	**2**	**3**	**4**
Sappi	Paper producer		1		
Alstom	electrical engineering firm		1		
Biotherm Energy	renewable energy developer			weak	
Blackharverst Trading	energy efficient appliance trader			weak	
Clean Energy Solutions	renewable energy provider			weak	
Exxaro	coal miner		1		
iGas	state owned gas firm		1		
Mainstream renewable power	wind and solar electricity provider		1		
Mbani Wesizwe	sustainable energy investment firm			weak	
Necsa	state owned nuclear research firm		1		
RES	Renewable electricity producers			weak	
Smart Green Prosperity	renewable energy firm			strong	
Tongaat Hullett	Sugar producer/renewable energy			strong	
Umoya Energy	renewable electricity developer		1		
Vestas	wind electricity producer		1		
Subtotals					
15		0	8	7	0
				5 weak	
				2 strong	
Civil Society/ NGOs/Private individuals and lobby groups					
Business Unity South Africa	business lobby group		1		
Climate Justice Now Western Cape	civil society network			weak	

Electricity Intensive User Group	industrial electricity users lobby		1		
EarthLife Africa	environmental NGO			strong	
Energy Caucus	civil society network			weak	
Idasa	political NGO			strong	
Koeberg Alert Alliance	anti nuclear civil society			strong	
Niasa	nuclear industry lobby		1		
SAFCEI	church based environmental civil society		1		
SASTELA	solar electricity lobby		1		
SAWEA	wind electricity lobby			weak	
Sustainable Energy Africa	Sustainable energy NGO			weak	
WWF	environmental NGO			strong	
subtotals					
13		0	5	8	0
				4 weak	
				4 strong	
Academic/ Consultants					
Dave Long IES Energy	sustainability consultant		1		
Alison Hughes UCT Energy Research Centre	Academic			strong	
Mark Pickering Meridian Economics	infrastructure consultant			weak	
Quartile Capital	financial services			weak	
Subtotals					
4		0	1	3	0
				1 strong	
				2 weak	
Totals					
32			14	18	
				11 weak	

				7 strong	
All submissions accessed through Department of Energy website and are available at http://www.energy.gov.za/IRP/hearing1.html					

Appendix 3

IRP public hearing 26 November to 3 December 2010

Business submissions						
Organisation	**Primary business**	**Paradigm 1**	**2**	**3**	**4**	**N/A**
Sappi (Durban)	Paper producers			weak		
AE AMD	renewable energy producer		1			
AA Tec	renewable energy consultancy		1			
Gestamp Solar	solar energy provider					Inaccessible
My power station	renewable energy systems			weak		
reto solar				weak		
Sanval Energy						inaccessible
Scatec						inaccessible
Siemens						inaccessible
Swartland Solar Park						inaccessible
Wartsila						inaccessible
Alstom Power	renewable energy provider		1			
Amda energia	renewable energy provider		1			
Amonix	solar power developer		1			
AngloAmericn	Mining		1			
Cogentrix	electricity producer		1			
Elitheni Coal	coal mining		1			

Exxaro	Mining		1			
G7 Renewable energies	renewable energy developer		1			
Smart green prosperity	renewable energy S			strong		
Mainstream renewable power	renewable energy developer		1			
Necsa	Nuclear consultant		1			
SolAfrica	thermal energy provider		1			
Tangent Mining	Mining			strong		
Westinghouse Electricty	nuclear provider		1			
China Guandong Nuclear	nuclear provider		1			
Clean Enrgy Projects	renewable energy		1			
East London IDZ/ Langa Energy	Renewable energy and efficiency consultant		1			
EDF Energy	renewable energy provider		1			
Eskom	electricity producer					inaccessible
iGas	LPG provider		1			
Sappi (Johannesburg)	Paper producers		1			
Subtotals:						
32		0	20	5	0	7
				3 weak		
				2 strong		
Civil Society/NGOs/ Pvt individuals/ Lobby groups						
Anti Privatisation Forum	Civil Society		1			
Dieter Holm	Pvt			strong		
EarthLife Africa Johannesburg	Environmental NGO			weak		
Greenpeace	Environmental NGO			weak		
Idasa	Political NGO			strong		
Niasa	nuclear lobby group		1			
Renewable Energy Centre	Energy NGO		1			

SAIPPA	IPP Lobby		1			
SAWEA	wind energy lobby		1			
WWF	Environmental NGO			strong		
Chamber of Mines	Mining lobby		1			
Climate Justice Now	Civil Society			weak		
Electricity Intensive User Group	Industry lobby		1			
Federation for a sustainable environment	environmental NGO federation					not specifiable
Fossil Fuel Foundation	Energy Lobby		1			
GENSA	gender and energy NGO			strong		
MamaEarth Foundation	Environmental Lobby			weak		
Off the ground Foundation				weak		
South African Council of Churches (Johannesburg)	Civil Society religious		1			
SAFCEI (Johannesburg)	Civil Society religious		1			
SASTELA	Solar Industry Lobby		1			
Youth in Climate Change Forum	Youth environmental NGO			weak		
Cape Chamber of Commerce	Business lobby			strong		
Idasa (Cape Town)	democracy NGO					not specifiable
Koeberg Allert Alliance	Civil society			weak		
Project 90*230	environmental awareness project					inaccessible
South African Council of Churches (Cape Town)	religious civil society		1			
SAFCEI (Cape Town)	Church based environmental civil society		1			
SAPVIA	Solar photovoltaic lobby					Inaccessible
Sustainable Energy Africa						Inaccessible
Worcester Business Forum						Inaccessible
Ecopeace	environmental civil society			weak		
EarthLife Africa Durban	environmental NGO			strong		
Geasphere	environmental lobby			strong		
Pamsa	paper industry lobby		1			
SAFCEI (Durban)	Church based environmental civil society		1			

South African Sugar Association	Sugar industry lobby		1			
Subtotals:						
37		0	16	15	0	6
				8 weak		
				7strong		
Academics and consultants						
Energy Institute Cape Peninsula University of Technology	academic		1			
Energy Research Centre University of Cape Town	academic					inaccessible
David Long IES Energy	sustainability consultant		1			
Dr David Fig UCT	Academic			weak		
Mike Deats	former Eskom senior manager		1			
North West University	academic					not specifiable
Standard Bank	financial services					not specifiable
Ted Blom	management consultant					not specifiable
Subtotals:						
8			3	1		4
				1 weak		
				0 strong		
Government bodies						
SALGA	local government			strong		
City of Cape Town	municipality			weak		
Greenscape	Western Cape govt agency		1			
Subtotals:						
3			1	2		
				1 weak		
				1 strong		

Totals						
80			**40**	**23**		**17**
				13 weak		
				10 strong		
Reference						
All submissions accessed t Department of Energy website at:	http://www.energy.gov.za/IRP/dbn.html					
	http://www.energy.gov.za/IRP/cpt.html					
	http://www.energy.gov.za/IRP/jhb.html					