



**AGENDA SETTING ANALYSIS OF HYDRAULIC FRACTURING IN SOUTH AFRICA –
AN APPLICATION OF KINGDON’S AGENDA SETTING THEORY**

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A thesis submitted in partial fulfilment of the requirements for the degree of
Masters in Social Sciences (Policy and Development Studies)
University of KwaZulu-Natal

November 2016

As the candidate’s supervisor, I approve this project for submission

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Declaration

I, Nthabiseng Gertrude Koetlisi, declare that:

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Nthabiseng Gertrude Koetlisi



13th March 2017

Mark Rieker

March 2017

Dedication

I dedicate my work to my son, Pabatso Andreas Koetlisi,
and my husband, Mr Koetlisi Andreas Koetlisi.

They are my inspiration, source of my strength. Thinking of them always filled me
with the courage and motive to work hard.

Acknowledgments

I thank God almighty for making it possible for me to achieve my dream. I thank Him for his unfailing love, for always being there for me and giving strength while I needed it most.

I also extend my sincere gratitude and appreciation to the following people:

My supervisor, Mr Mark Rieker, for his support and guidance. He was patient with me and never stopped encouraging me to be the best person I could be. I thank him for always believing in me.

Kim Ward, for editing my work.

My husband, Mr Koetlisi Andreas Koetlisi, for his unconditional love and support. He made it possible for me by financing my studies.

My parents, Mrs Manti and Mr Seke Qalo: your love and support has motivated me to achieve my dreams. I always wanted to make you proud. Ke leboha boitelo ba lona, lerato le tshehetso eo le mphileng eona leetong lena la boithuti. You are my heroes.

My sisters, Lineo Qalo and Politi Mohau, and my brother, Nti Qalo: you have always been the source of my comfort and inspiration when I needed it most. I thank you for the love and support and for always believing in me.

I also pay respect to my fellow post-graduate students: Thobeka, Simenyiwe, Lindelane, Mrs Mtshali, Andrew and Nqobi. You made this journey enjoyable. I wish you success in your journeys.

I thank all friends and family members from both sides who have always supported me.

Abstract

This dissertation unpacks the agenda setting process of energy as a policy issue from 2008 to 2015. It explores how and why hydraulic fracturing emerged and developed as a policy alternative in this regard. The agenda setting theory of John Kingdon is applied to guide this analysis. Agenda setting examines how problems gain the attention of government so that policy alternatives can be examined and identified. Kingdon explained this process through three analytical streams: the problem stream, the policy stream, and the political stream, and discussed how their convergence can result in a policy window wherein an issue comes to the attention of policy makers and policy alternatives can be developed and decisions can be taken.

A qualitative research methodology was employed to explore all the events and the participation of different actors which led to the identification of hydraulic fracturing as a policy alternative. Data was collected through documentary analysis and was analysed using qualitative thematic analysis.

The findings of this study have reflected the agenda setting theory of John Kingdon. As Kingdon has argued, when the three streams are coupled together, it is an appropriate time to address the problem and for a policy change. This is applicable in this study: the energy problem was recognised, and a suitable policy solution was attached to problem, accompanied with a change in the political stream. The window opens when the three streams are coupled together.

The window opened in 2008 when the energy problem became intense, during the period when the country experienced load shedding. This was when the energy problem was considered a crisis that demanded attention. Policy entrepreneurs advocating for hydraulic fracturing saw the window of opportunity and pushed for their proposals to government decision makers. A change in the political stream was also experienced. Important government decision makers like the President and other administrators were interested in solving the energy crisis and were in support of hydraulic fracturing. They considered hydraulic fracturing as a feasible solution to the energy crisis.

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Acronyms

ACF	Advocacy Coalition Framework
CDE	Centre for Development Enterprise
CO ₂	Carbon dioxide
DME	Department of Minerals and Energy
EMP	Environmental Management Programme
IRP	Integrated Electricity Resource Plan
MPRDA	Mineral and Petroleum Resources Development Act
NDP	National Developmental Plan
NEMA	National Environmental Management Act
NWA	National Water Act
SEA	Strategic environmental assessment
TKAG	Treasure the Karoo Action Group

CHAPTER ONE: INTRODUCTION AND BACKGROUND

1.1 Introduction

Hydraulic fracturing was considered as a possible response to the energy crisis in South Africa (SA) since 2008 (Tucker and van Tonder 2014). Historically, South Africa has always been dependent on coal as a source of electricity with an estimate of 72.1% of energy supply being coal-based. The Centre for Development Enterprise (CDE) (2008), reporting on South Africa's electricity crisis in the third week of January 2008, noted that the country's electricity generating ability was reduced by 20 %. By the fourth week, a quarter of state energy entity Eskom's ability was affected. Most places in the country went for days without electricity supply. The national grid almost crashed (Goldberg 2015). To prevent a crash, gold and platinum mines had to suspend their production for five days. They only resumed production after an agreement that they would reduce their electricity consumption by 10 % (CDE 2008). The cause of this crisis was reported to be a decrease in the availability of coal to sustain Eskom to maintain electricity production and supply (CDE 2008).

It was during this time that a new term 'load shedding' was introduced. Load shedding was a strategy employed by Eskom in which electricity would be cut in some places for several hours. This strategy severely affected the economy and people's everyday life (Goldberg 2015). However, during that period nothing was done about the issue at the core of the problem until CDE organised a meeting in which government authorities, business and trade union leaders were invited to discuss the causes of the crisis, consequences and what could be done (Barker 2008). This was when the country started to pay attention to the crisis.

While coal is behind 72% of the country's energy consumption, the extraction of shale gas through hydraulic fracturing was considered a feasible source of additional power (Munro 2015). Hydraulic fracturing, sometimes referred to as fracking, is a technique employed by engineers to extract gas from underground. In this process a mixture of water and other chemicals are used to pressure and fracture rocks. The pressure forces natural gas to flow back to the surface from shale rocks or other types of rock formations (Healy 2012). Shale gas has been argued to be cleaner than coal as it emits less CO₂ per mega-watthour than coal (Munro

2015). Coal emits too much carbon dioxide leading to air pollution. Therefore, the Department of Mineral Resources decided that a cleaner method of power production needed to be considered (Bocora 2012). The extraction of shale gas is to be implemented in areas that fall in the Karoo basin in South Africa such as Pietermaritzburg and its surroundings, Ulundi, Melnoth, Pongola, Newcastle and Vryheid in KwaZulu-Natal, the Free State and the Eastern Cape. It is believed that shale gas will produce sufficient oil and gas to bolster the country's energy needs (Tucker and van Tonder 2014). Hydraulic fracturing and horizontal drilling are technologies that have been used in many countries and could be used in South Africa to access the shale gas (Cooley and Donnelly, 2012).

Implementation of hydraulic fracturing had generated a strong controversy across the world. Supporters of hydraulic fracturing argue that it is the best option when compared to coal as hydraulic fracturing emits less carbon dioxide and is a cleaner source of energy (Kirkland 2010; Wang et al. 2014). It could also contribute to an increase in energy reservation, employment and economic benefits (Davis and Hoffer 2012). The opponents' argument is that the chemicals employed during its process have the potential of contaminating drinking water which could endanger the public's health. In addition, fracking uses large amount of water. It can also result in earthquakes (Davis and Hoffer 2012). Pointing to these effects, countries like United State of America, France and South Africa have faced strong opposition from the public (Good 2015).

Since 2008 when South Africa indicated an interest in hydraulic fracturing, many companies such as Bundu Oil and Gas, Shell SA and Falcon Gas and Oil submitted their applications for exploration rights (Netshishivhe 2014). However, environmental groups and community members have opposed the government decision of going for exploration of the shale gas. They were concerned about the environmental impact hydraulic fracturing. They were also concerned about the disposal of the mixture of water and chemicals used during this process which they argued would contaminate drinking water. It has also been argued that the government has decided on hydraulic fracturing without proper public consultations and research being conducted. These concerns resulted in greater debates as to whether this technology must be implemented or not (Peek, Lewis & Teuling 2014). Hydraulic fracturing had

to be suspended as the Minister of Mineral Resource ordered a task team to be formed to conduct an impact assessment (du Plessis 2015).

In 2015 the Petroleum Exploration and Production Act was gazetted in accordance with section 107 of the Mineral and Petroleum Resources Development Act 28 of 2002 (the MPRDA). This regulation was passed after several regulations were formulated or amended. These developments in the legislation were meant to provide for hydraulic fracturing implementation in the country as the previous laws had not (Munro 2015). South Africa is considering hydraulic fracturing based on experiences in the USA. The USA has been successful in generating enough energy for its country and has created numerous employment opportunities (Brady 2011). The South African government's vision is to create millions of jobs by 2020; it is assumed that hydraulic fracturing would contribute significantly to this goal while at the same time responding to the energy demand (Munro 2015).

1.2 Research problems and objectives

This dissertation unpacks the agenda setting process of hydraulic fracturing as a policy alternative from the government's first considerations of fracking in 2008 until 2015. It explores how and why hydraulic fracturing emerged and was developed as a policy alternative. The agenda setting theory of John Kingdon is applied to guide this analysis. An agenda setting process is the process that focuses only on those issues or problems that receive attention at a certain time (Kingdon 1995). This process, according to Furlong (2004), helps some problems gain the attention of government so that policy alternatives can be examined and identified. Kingdon's agenda setting theory helps in explaining how issues obtain space on the government's agenda and how possible solutions are being developed. He explains this process through three streams which are the problem stream, the policy stream, and the political stream and discusses how their convergence can result in a policy window wherein an issue comes to the attention of policy makers and policy alternatives can be developed and decisions made (Kingdon 1995).

1.3 Research questions

The central research questions answered in this dissertation are based on Kingdon's agenda setting theory's three streams of analysis (problem, policy and political streams). The following questions are explored:

How has energy production emerged as a policy issue in SA?

How has hydraulic fracturing emerged as a policy alternative in SA?

What is the problem environment regarding hydraulic fracturing in SA?

What is the political environment regarding hydraulic fracturing in South Africa?

What is the potential policy development in the area of hydraulic fracturing?

1.4 Research methodology and methods

Qualitative research methodology is employed in this study. This allows a researcher to obtain a deeper understanding of social phenomenon (du Plooy-Cilliers, Davis & Bezuidenhout 2014). Qualitative research produces data in words not in numbers (Strauss and Corbin 1998). Qualitative research attempts to broaden or deepen our understanding of how things came to be the way they are in our social world (du Plooy-Cilliers et al. 2014). This method according to Neuman (2000) analyses, displays, summarises and interprets words. Therefore, it was found appropriate for this study since the main objective of this study was to unpack the agenda setting process of hydraulic fracturing as a policy alternative from the government's first considerations. It explores how and why hydraulic fracturing emerged and was developed as a policy alternative employing Kingdon's framework of agenda setting.

1.4.1 Data collection method- Non empirical

Data for this research was collected through documentary analysis. In documentary analysis, data may be collected through analysing primary sources such as letters, policies and reports. It also involves analysis of secondary sources which are developed through transcribing or editing primary sources (Burgess 1984). Secondary data sources such as journals, articles, government documents, reports, etc. were also analysed (Hofstee 2006).

1.4.2 Sampling

The study employed non-probability sampling, specifically purposive sampling strategy. With purposive sampling, the sample is drawn based on the elements considered useful and relevant for the study (du Plooy-Cilliers et al. 2014). Sources were selected based on the three streams of Kingdon's theory. Sources relevant to the study such as meeting minutes accessible to the public, parliamentary proceedings, newspaper articles and speeches, reports from Ministry of Mineral resources and other organisations, public opinion data were analysed.

1.4.3 Data analysis

Qualitative thematic analysis was employed to analyse data in this research. Thematic analysis uses thematic coding and encoding data. Coding is a technique used to establish the relationship between data collected and other people's ideas on a certain topic. Coding allows the researcher to analyse data relating it to research questions, objectives and theoretical framework (Coffey and Atkinson 1996 cited in Boyatzis 1998). According to Du-Plooy-Cilliers et al. (2014), thematic analysis employs deductive coding in which answers to the research questions are drawn from the sampled literature. With encoding, data is organised to establish and create themes (Boyatzis 1998).

For this study, themes and codes were deductively developed from the research questions which were based on Kingdon's agenda setting theory.

1.5 Structure of the research dissertation

This dissertation has been divided into five chapters. Chapter one has provided the background to the study. Chapter Two provides the conceptual and theoretical framework with a discussion on public policy, agenda settings and different theories on agenda setting process, including that of Kingdon's agenda setting theory which underpins this study. Chapter Three provides a literature review. Chapter Four is about the agenda setting process of hydraulic fracturing in South Africa. The final chapter provides discussion and a conclusion to the study.

1.6 Conclusion

This chapter has provided the historical background behind hydraulic fracturing in South Africa. It established the factors and events that have led to the consideration of hydraulic fracturing.

It then presented the problem statement, aims and objectives of the study and research methodology employed. Finally, it has presented the structure for this dissertation. This introductory chapter leads to the conceptual framework chapter which discusses in details the theory underpinning this research.

CHAPTER TWO: THEORETICAL AND CONCEPTUAL FRAMEWORK

2.1 Introduction

The focus of this research is on the agenda setting process of hydraulic fracturing as a policy alternative. Research on agenda setting is focused on establishing both how some issues and problems become policy issues and get the attention of the government and its policy makers as well as the public, and also on how policy alternatives are developed (Kingdon 1995). This chapter will discuss different agenda setting frameworks before focusing on Kingdon's agenda setting theory which guides this study. Kingdon's agenda setting theory which was tested in the United State America is applied in this study in the context of South Africa since it provides an analytical tool that provides an explanation of how the process of policy making unfolds and how the problem, policy and politics streams, when combined, can build and develop into a policy. This chapter will preface by establishing agenda setting in the field of public policy.

2.2 Public policy

There are various definitions of public policy. Hogwood and Gunn (1984) have argued that public policy is a subjective matter as different scholars define it based on the influence of their experiences and conditions. Most of the definitions that will be outlined here agree on one thing: that policy is a course of action. For instance, policy according to Cloete, Wissinkand de Coning (2011) is a document declaring what is to be done to solve a particular problem. Policy states the activities that are to be done to achieve a certain goal or to improve a particular situation (Howlett and Ramesh 2003). Starling (1979) further added to these definitions by saying that policy provides guidelines on what is to be done and what is not to be done. Baker, Richard & Everett (1975) have defined policy as "a mechanism employed to realize societal goals and to allocate resources".

Scholars like Peters (1998, cited in Gerston, 2004) have argued that policy is all government initiatives that are implemented to impact on people's lives; these initiatives can either be carried out by the government itself or it can appoint any agency to act on its behalf. Gerston (2004) expanded this definition by arguing that public policy is all the decisions and plans to which government authorities or decision makers commit themselves.

However, scholars like Smith (1976, cited in Hill, 1997) argued that policy is not only about what is to be done; it can also be about deciding not to take action; what is not to be done. Policy can be "about making decisions but also about indecision by the government, party or a ruler" (Ndlovu 2010). Other scholar's definitions differ from the above definitions which all agree that policies emanate from the government. Hanekom (1987) argued public policies can stem from the public, interest groups like civil societies, media and many other stakeholders outside or inside the government.

Public policy is the outcome of a policy making process and we can only have public policy after this process has been accomplished (Theunissen 1998, cited in Venter 1998). This process of making a public policy comprises different stages which include policy initiation, design, analysis, formulation, analogue and advocacy, implementation and evaluation (Cloete et al. 2011). The policy cycle is composed of different stages and agenda setting forms part of policy cycle. According to Jenkins-Smith and Sabatier (1993), agenda setting is the first stage in the policy cycle. In this stage, different possible alternative solutions are explored and one or more solutions considered best policy solutions are identified and adopted (Kingdon 1995).

2.3 Agenda setting

As noted earlier, an agenda setting analysis is the policy analytical technique that is employed in this study. Therefore, it is important to define what it is meant by an agenda. An agenda, according to Kingdon (1995), is a list of issues or problems requiring serious consideration at a certain period either by government or people outside the government or those affiliated to government authorities. Some of the issues or problems on the agenda receive more attention than others and some may be rejected (Kingdon 1995). Jones shared these views with Kingdon and defined an agenda as those issues that demand public action (1984).

The agenda setting process, it is the process that narrows to only those issues or problems that receive attention at a particular time (Kingdon 1995). This process, according to Furlong (2004), helps certain problems to gain the attention of government so that policy alternatives can be examined and identified. Agenda setting is further defined by Cloete et al. (2011) as a deliberate planning stage in which policy issues are established, problems are interpreted and more pressing problems are outlined, support for the prioritised problem is organised and decision makers are influenced to respond to and solve the problem. In the policy making process, the first thing is the establishment of the problem or the issue that may affect society or part of it by any stakeholder being affected by the problem or representing those that are affected by problem (Cloete et al. 2011). They claimed this is the most important stage in a policy making process since it is where more pressing and important policy issues that demand serious attention are identified; those that have an effect and power over policy making process are determined; and lastly this is when interested stakeholders attempt to influence the agenda of policy decision makers (Cloete et al. 2011).

McCombs (2004) provided a different definition in which he argued that “agenda setting is a robust and widespread effect of mass communication, an effect that results from specific content of media”. Some definitions of agenda setting are embedded in pluralism; they argue that the policy making process is influenced by actions of social groups (Howlett and Ramesh 1995 cited in Hogwood and Gunn 1984). However regardless of where this process stems from or who influences it, all definitions agree that it is the identification and prioritisation of a policy issue or problem that requires the government to act and establish a relevant solution. This process is crucial since there are many policy problems and issues that government must respond to but cannot because of scarcity of resources; agenda setting serves to identify the urgent ones (Hogwood and Gunn 1984).

Kingdon’s theory gives an analytical tool that provides an explanation of how the process of policy making unfolds and how the problem, policy and politics streams, when combined, can build and achieve a plan (Kingdon 1995). According to Kingdon’s theory, inevitable problems pressuring the state to take action, like a crisis or a change in any valuable indicator, may influence the agenda. The second influencer of the agenda, according to Kingdon, may be

increased knowledge among policy specialists in a specific policy area which may result in development of new policy proposals by those specialists based on their accumulated knowledge. He argued that the third process that may influence the agenda may be political processes which could be change of “national mood, public opinion, election results, changes of administration, and turnover in Congress” (Kingdon 1995).

There are several agenda setting models, however this chapter will only focus on the Policy Advocacy Coalition (PAC) Framework, the Punctuated Equilibrium Model and Evolutionary Theory and Kingdon’s Agenda Setting Theory.

2.4 Agenda setting theories

2.4.1 Sabatier's Policy Advocacy Coalition Framework (ACF)

ACF is a policy process framework established by Sabatier and Jenkins-Smith focusing on what they call ‘wicked problems’, which include conflicts that may arise among different government actors involved on goals and technical aspects (Sabatier 2007). Sabatier’s framework assumes that a policy change may be influenced by three factors of which the first is the *interaction of competing advocacy coalitions within a policy sub-system community*. He argued that these advocacy coalitions are made of stakeholders from all spheres of government, public and private organisations with similar beliefs and policy goals who want to influence government authorities for policy change (Sabatier 1991). Among this coalition there are what he called *policybrokers* who are people who are there to resolve conflicts that may arise between the coalitions (Sabatier 1991). The second factor is *changes external to the subsystem*; he argued change in a policy may be influenced by external factors like socio-economic circumstances. The third factor is *the effects of stable systems parameters*; he argued that institutional structures or constitutional rules can either facilitate or constrain policy change and he cited federalism as one likely constraint (Sabatier 1991).

ACF assumes that policymaking is a complicated process which requires specialised and knowledgeable actors in a policy area for them to be influential, especially in more modern societies. This specialisation happens in a policy sub-system in which there are many actors trying hard to persuade for policy change in a policy sub-system (Sabatier 2007). Among these policy actors are legislators, agency officials, interest group leaders, researchers and journalists

specialising in a particular policy area, together with judicial officials who regularly get involved in a policy sub-system (Sabatier 2007). ACF holds the belief that policy actors have the capacity to turn their beliefs into a policy. In addition, scientific and technical information can play a very crucial role in influencing policy actors' beliefs. This framework values the role played by participants like university scientists and researchers, policy analysts and consultants in a policy process (Sabatier 2007).

2.4.1.1 Advocacy coalition

ACF assumes that "stakeholder belief and behaviour are embedded within informal networks and that policymaking is structured, in part, by the networks among important policy participants" (Sabatier 2007). ACF assumes that policy actors fight to ensure that their shared beliefs become policies before their competitors do the same. To succeed, policy participants combine their resources, efforts and their expertise to complement each other in coming up with more convincing and winning strategies. They mobilise support among those with similar beliefs like legislators, interest groups, agency officials, judges, leaders, researchers and authorities from all government levels (Sabatier 2007). If these policy participants get involved in a "nontrivial degree of coordination" they become an advocacy coalition (Sabatier 2007). Sabatier argued that advocacy coalitions, according to ACF, can be beneficial for influencing multiple organisations and participants involved in a sub-system which may involve more than one advocacy coalition.

Advocacy coalitions constitute the main theme of ACF and they have been critiqued by many researchers, such as Schlagers (1995) who criticised it for not providing convincing proof that policy participants sharing policy beliefs can actually partner to form a coalition (Sabatier 2007). Other research responded to this criticism by arguing that these coalitions do exist although conflicts may arise among them.

2.4.2 Punctuated equilibrium model

This model started with the analysis of policy making in America. It emphasises "the interaction of political institutions, interest mobilisations, and bounded rational decision making" (Sabatier 2007). It establishes that the interaction of different institutions with similar interests and motives can be beneficial in policy making process. Baumgartner and Jones (1993) argued that

many governments are faced with many problems and policy solutions, as well as responsibilities that demand space on their agendas, and they have been responding by interacting with other systems at different levels. They argued that government cannot attend all issues and instead share their responsibilities and their political issues by cooperating with different sub-systems. These sub-systems may be focused on a specific interest which they may compete with other interests (Sabatier 2007).

Baumgartner and Jones (1993) also argued that within a policy community, conflicts may arise. As time passes, new interests emerge, which can be dealt with in different ways within a policy community. Groups of specialists may bargain and reach consensus and can be in a position to obtain what they need from the political system. On the other hand, policy communities experiencing conflicts are more vulnerable and less likely to win in politics. If conflicts persist, the nature of policy community may take a different form (Baumgartner and Jones 1993).

However, according to Baumgartner and Jones (1993), in a policy sector, stability may be experienced for a long period which can be followed by the emergence of new public interests, media scrutiny and public movements. Public opinion and media can influence government authorities' agenda. At the same time, top officials can influence the agenda by mobilising the support of politicians, media and public opinion, thereby resulting in a policy change (Baumgartner and Jones 1993). Coalitions of different groups may form a strong force that can influence the agenda. The interaction of policy participants aspiring for policy change can result in a strong argument which can push for a policy.

2.4.3 Kingdon's agenda setting theory

Kingdon's theory explains why change occurs and why some problems become more important than others. Kingdon argued that there are two factors that influence agenda setting and identification of policy options: participants who are actively involved and ways in which some agenda issues and alternatives become noticeable and important (Kingdon 2011).

2.4.3.1 Participants

Kingdon sheds light on players that participate in the agenda setting process and on those who are more crucial than others in the process and on those assumed to be important who are not and how these actors relate to each other in these processes.

According to Kingdon (2011), agenda items or alternatives can sometimes arise from participants from inside or outside the government. Participants from the government may include the president, the congress and executives while those outside the government may include the media, interest groups, political parties and the public. Change can also be brought by election results which may come with new ruling party or new party leaders. Agendas may also emanate from any participant outside government which may sometimes be the mobilised public concerned about their leaders' decisions. However, mostly the agenda originates from party leaders or parties (Kingdon 2011).

2.4.3.1.1 Participants inside the government

The administration

According to Kingdon (2011), administration can be composed of three actors which are the president, executive office, appointed politicians in departments and bureaus answering to the president or any one of the previously mentioned actors. Administration is sometimes more dominant in the policy making process. A decision from administration is usually considered important; if the administration decides a problem or an issue deserves to be a priority, many other actors are also likely to consider it as a priority. Policy advocates whom their proposals manage to get the attention of the administration, are more likely to succeed in fitting their agenda in government's policy agenda list (Kingdon 2011).

Of the three actors in the administration, the president is argued to be the most important. The president can set an agenda on his/her own but the executive branch or the congress or actors outside government cannot do this without presidential buy-in. However, the president does not have full control over the policy agenda as there may be other factors or events that may impact on his/her agenda or other actors' agenda and which are beyond his/her control (Kingdon 2011). Although the president is argued to have dominant power in prioritising issues

on the agenda, s/he does not have control in identification and selection of alternatives (Kingdon 2011).

Presidential staff

The staff in the White House and the executive office answering to the president form another component of the administration. Some of the staff members are important presidential advisors while others are specialists from different fields who form the executive office (Kingdon 2011). According to Kingdon (2011), these presidential advisors are crucial in an agenda setting process although they have not always been discussed since most agenda issues are transferred to executive sub-sections like departments and bureaus, some are passed downward and those most important are addressed by the president or his personal advisors. Presidential staff may facilitate or delay the process of alternatives identification. Their role in this process is more focused on alternatives while the president has more control in setting the agenda (Kingdon 2011). Presidential staff is responsible for ensuring that negotiations between responsive stakeholders, such as departments and important interest groups are established, which will in turn result in administration proposals and will establish how the administration will be involved in bargaining when proposals pass through the legislative process (Kingdon 2011).

Political appointees

The last component is formed by those officials selected by the president in departments and bureaus such as cabinet secretaries, bureau heads' administrations, agencies and many others. In a traditional legal theory, political appointees are actually policy makers because they are likely to be ordered by the president and other authorities to go on with policy making (Kingdon 2011). Kingdon argued that these appointees play a very important role in the agenda setting process; they may not be the founders of ideas but can help push some of those ideas into official agendas, both within and outside their agencies. Issues or policy proposals within executive agencies which have been delayed are likely to be passed if they get the attention of a valued political appointee (Kingdon 2011).

2.4.3.1.2 Participants outside of government

These participants, as indicated earlier, include “interest groups, researchers, academics, consultants, media, parties other elections related actors and the mass public” (Kingdon 2011). But Kingdon argued that the distinction between actors within and outside government is very subtle. For instance, interest groups are involved with lobbying that could be done by officials from the government; also researchers may have relationships with government officials or work as government consultants.

Interest groups

Interest groups play different roles. Some of their activities may have an impact on the agenda while some of their actions may influence or impact on alternatives established by policy makers. Their actions can either be positive or negative; they may positively support new government initiatives or make it impossible to experience policy change if they do not support a new initiative (Kingdon 2011). Interest groups are, however, more active in opposing and blocking new issues or alternatives from being considered than in supporting and upholding actions.

Interest groups mostly have a positive influence on the agenda of government. They are capable of mobilising enough support and making enough noise to attract the attention of government officials and place their issues on the government agenda (Kingdon 2011). However, Kingdon argued that interest groups cannot push their agenda on their own into the government’s agenda. Many factors need to be in place for an issue or policy alternatives to be considered by government officials in addition to the pressure from interest groups. Again, interest groups can only succeed in raising their issues but do not have the power to influence the debates once the issue is being explored (Kingdon 2011).

Academics, researchers and consultants

These participants form a crucial set of actors outside the government in the policy making process. They are often referred to and consulted by administration and congressional committees to give their opinions and advice on their respective fields (Kingdom 2011). Their

importance is mostly experienced in the exploration and development of alternatives rather than in raising government agendas. When there is an issue or problem that needs attention, politicians invite these experts to develop policy proposals aimed at addressing their concerns. Academics are most active and influential in developing alternatives (Kingdon 2011).

Media

Mass media is considered to have an impact on agenda settings as it influences both public opinion and the government agenda. Issues that receive considerable media coverage are more likely to influence the thinking of the public and the government (Kingdon 2011). However, the media is considered less influential in agenda setting as it focuses on issues for only a short period before moving on to other issues which may lessen its impact. The media also tends to focus on what government is already doing or what government is aware of. But this does not imply that the media is not important as it can work as a “communicator within policy community” (Kingdon 2011). Different actors both from within and outside government having similar interests may communicate through media. Their ideas may be presented on popular radio stations or in newspapers making their fellow colleagues aware of what others are doing or are thinking about (Kingdon 2011). Administration also tends to place attention on issues that have the attention of mass media more than on issues that are raised on reports or papers. Media can also influence the agenda by magnifying already established movements. Again, if the media manages to affect public opinion, it is likely that the administration will attend to the issues raised by public opinion (Kingdon 2011). Shirky (2011) argued that social media has had considerable impact on the government’s agenda since the introduction of the Internet in the 1990s. He argued that social media connects millions of actors, including civil society, activists, citizens and government. Social media promotes public participation since it creates an opportunity for different actors to have access to information, public speech and can allow them to mobilise for collective action. Through social media, the networked population can seek change.

Public opinion

According to Kingdon (2011), public opinion can have an important effect on an agenda since government officials consider the public’s views to direct their course of action. Public opinion

may have either a negative or positive impact but the former is the most noticeable. Public opinion tends to play more of a blocking role than one of raising issues. It can also have positive effect; public opinion may support and promote government agendas and policy alternatives which can be evidenced by public compliance with the policy (Kingdon 2011).

Public opinion may influence the agenda more than alternatives (Kingdon 2011). If the majority of the public shows an interest in a certain issue, it is highly likely that government authorities will also consider the issue. But the public does not appear to have much influence on alternatives that may be explored by government to address the issue. Kingdon argued that policy specialists are the ones that get involved in debates in exploring the best possible solutions; the public may not be well skilled and or sufficiently knowledgeable to participate in these debates with professionals (Kingdon 2011).

Mass public opinion can affect the agenda of government, but Kingdon (2011) argued that public opinion agenda is more influenced by government officials in the same way as the media is. Highly respected officials or experts may raise an issue and the public will follow and make the idea more popular. Government officials or the administration may have their own agenda or policy proposals; then they need to mobilise public support (Kingdon 2011).

2.4.3.2 The process of agenda setting

Kingdon explained agenda setting process using three streams: the problem, policy and political streams. He argued that these streams come together at the appropriate time and produce public policy. The coupling of these streams happens when what he calls a policy window opens. This process is briefly discussed below.

2.4.3.2.1 Problem stream

Kingdon (2011: 90) argued that there are many problems that demand to be considered but only a few will be considered while others are dismissed. In this stream, he explained how and why some problems get to be considered while others lose the attention of decision makers. His argument was that some problems may gain the attention because of their indicators, or because of a sudden event that triggers the attention of decision makers or because the feedback from running programmes calling for intervention. It is also depended on how

different actors interpreted issues; some may define some issues as problems while others may disagree (Kingdon 2011).

Indicators

Government decision makers in most cases get to know about problems because of indicators which imply that a problem exists. Government and other non-governmental organisations frequently monitor projects and circumstances within their communities so their findings may indicate a problem which demands attention (Kingdon 2011). Apart from routine monitoring, some indicators can be identified from the findings of researchers or academics on certain problems. Decision makers use these findings or indicators to assess the “magnitude of a problem and changes in a problem or change in indicators” (Kingdon 2011, 19).

Policy participants pay much attention to problems that are demonstrable; problems with demonstrable indicators showing an agent need to find solutions. However, indicators alone do not mean the problem will get onto the agenda of government; what is important is how the findings or indicators are interpreted (Kingdon 2011).

Focusing events, crises and symbols

Indicators can help some problems gain recognition from government authorities but focusing events such as a crisis or disaster that intensify the problem result in more attention (Kingdon 2011). Focusing events may be powerful depending on the personal experiences of policy decision makers and the effect of a powerful emerging symbol (Kingdon 2011). Focusing events alone cannot be defined as policy problems; they act as early warning signs that need to be accompanied by an indicator demonstrating the magnitude of the problem (Kingdon 2011).

Feedback

Government officials may also learn about problems from the feedback they get from monitoring and evaluation of operating programmes. They can also get feedback from complaints brought by the public about the programme or casework or administrators can learn about the problem through their daily administration (Kingdon 2011). They can use feedback to judge if the programme is working according to its design, if it is achieving its

anticipated goal, or if there are unexpected results or negative consequences or excessive costs. Through feedback, they judge if the problem requires their attention (Kingdon 2011).

2.4.3.2.2 The policy stream

Kingdon (2011) referred to this stream as a 'policy primeval soup'. He argued that in the policy world there is what he called a community of specialists, which is composed of specialists both from inside and outside the government. This includes researchers, congressional staffers, people in planning and evaluation offices and budget officers, academics, interest group analysts. These specialists are all interested in policy problems. Within this community, specialists develop numerous proposals which they believe they will one day become policies; they interact and exchange ideas that can help generate proposals (Kingdon 2011). Within a community, fragmentation may be experienced, policy specialists may not have common paradigm. When fragmentation occurs, communities may experience instability and conflicts which can result in a fragmented policy (Kingdon 2011). But united communities with similar goals and beliefs may produce a strong integrated community resulting in a stable agenda (Kingdon 2011).

In this 'policy primeval soup' ideas float, alternatives and proposals are developed. Many specialists formulate proposals and alternatives that they hope will one day be selected as solutions to existing problems. They exchange and share their ideas with other specialists within policy community (Kingdon 2011). When specialists advocate for their proposals, Kingdon refers to them as 'policy entrepreneurs'. Some of the proposals could become famous and be honoured for a certain period but vanish within no time, others become prominent and survive but may get altered (Kingdon 2011).

Policy entrepreneurs use different forums to advocate for their proposals. Policy entrepreneurs are defined as advocates for proposals or for problems or issues to receive the attention of government (Kingdon 2011). They work hard to mobilize the public and different actors including the policy community that is not supporting policy change (Kingdon 2011). Policy entrepreneurs aim to 'soften up' all the actors to accept new changes and welcome their proposals. All their efforts are intended to pave the way to capture the interest of important actors long before the opportunity actually opens. This to ensure that when the opportunity

arises, important people are fully aware of their proposals and embrace them since opportunities often only open up for a short time (Kingdon 2011).

Policy entrepreneurs may attempt to 'soften up' the public. This can be done by providing education aimed at changing the public's thinking and garnering their support (Kingdon 2011). There are many ways to educate the public which can be used simultaneously. They may introduce their proposals or bills on the Hill and let the public talk and deal with the issue. They can also educate through congressional hearings in which they can present their proposals and problem in the form of a play (Kingdon 2011). Civil servants and important appointees may also soften up the public through making as many speeches as possible on the issue throughout the country before the policy is introduced.

Different proposals and ideas in this stream are presented to government officials. The officials and those around them both from inside and outside the government assess, discuss and debate the proposals they have. Proposals are judged by government officials in terms of their political costs and benefits (Kingdon 2011). According to Kingdon (2011), for proposals to survive they have to meet the criteria of decision makers. They have to be technically feasible which means they should clearly outline how they will be implemented. They should be value acceptable, that is should meet the values of policy community members. They should also anticipate future potential constraints. Their costs should also be practical and they should be acceptable to the public and specialists. Proposals that fail to meet these criteria can be amended to fit the criteria or be merged with something and then go back into the primeval soup (Kingdon 2011).

2.4.3.2.3 The political stream

Political spheres may have a considerable effect on the agenda of government. Change in the administration or national mood may push some problems onto the agenda while removing others. Interest groups can prevent some proposals from being put onto the government agenda if they do not support such policy alternatives (Kingdon 2011). Changes in the political stream can have a strong impact on the agenda.

The national mood

Kingdon (2011) described change in national mood as a change of public opinion when the majority of people in a country share common thinking. Public moods change from time to time and this shift affects policy agendas and outcomes. The shift in national mood can be detected by government participants, those within and outside of government. When this shift occurs, it creates an opportunity for government participants to raise certain issues while preventing others from obtaining space on the agenda or removing some from the agenda (Kingdon 2011).

According to Kingdon (2011), it is inaccurate to think that the national mood emanates only from the public mass; it can also come from scholars or the president may discuss his interests with the public thereby influencing the public opinion. Similarly, social movements may not reflect the ideas of the general public; they may be organised by organisations or some leaders who may have an influence on policy. Social movements may have a considerable influence on national mood (Kingdon 2011). Government officials and those surrounding them may sense the national mood through reading newspapers, listening to the comments of the public during meetings, analysing public events covered by media or through representatives of interest groups, party activists or individuals who visit their offices. Non-elected officials learn about national mood from politicians and the media (Kingdon 2011).

Shifts in the national mood may influence the agenda or policy in many ways. Public opinion may have an effect on the party's image thereby affecting election results and resulting in a new government (Kingdon 2011). The change of climate within a country may enable some proposals to flourish and remove others that were prominent from the agenda. Changes in national mood can come with a new audience and provide an opportunity for advocates of new proposals to push their ideas (Kingdon 2011).

Organised political forces

This is the second component of the political stream. According to Kingdon (2011), interest groups are still important in this stream as participants within and around government respond to their activities. However, within these organised activities, there may be conflicts which demand consensus building. Government officials may respond very well if interest groups share a similar goal since this may provide an enabling environment for them to act. But if there

is no consensus between interest groups, political leaders may try to create a balance between those supporting the policy idea and those opposing it. Even if there is no balance between groups, government officials may still push the idea onto the agenda (Kingdon 2011).

Government in the political stream

The third component of the political stream is the circumstances within the government itself. Change of administration within the government comes with new changes in the policy agenda and priorities. This is because newly elected officials need to fulfil the promises made during their campaigns before being elected into power. This turnover creates an opening for some advocates to push their proposals while becoming a constraint to others (Kingdon 2011). Apart from turnover, jurisdiction may also impact the agenda. Some issues may not be considered simply because “they are defined away by the drawing of jurisdictional boundaries” (Kingdon 2011).

2.3.3.2.4 The policy window and coupling of the streams

A policy window is defined by Kingdon (2011) as a chance for policy advocates to put pressure on government decision makers to consider their policy solutions on the problem they feel demands attention. Policy advocates prepare their possible solutions and wait for a day when those problems they seek to solve become prominent; this is the time when a window opens and grants them the opportunity to present their proposals. A window opens when there is a change in political stream. Policy entrepreneurs always have their prepared proposals at hand, waiting for an opening of the window which can be unpredictable (Kingdon 2011).

The three streams discussed can couple together at a critical time. At this critical time, a problem is identified and a policy alternative to solve the problem is established and presented to the policy community, accompanied with a change in a political stream that support the problem and a solution. When the three streams are coupled together, this is the appropriate time to address the problem and for policy change (Kingdon 2011).

The window provides a suitable time for policy entrepreneurs to push for their alternatives. It opens for a very short period; therefore, policy entrepreneurs fight to push their proposals onto the government agenda since such opportunities do not present themselves more often

(Kingdon 2011). When a window opens, some proposals are identified and move onto the decision agenda. Proposals on the decision agenda stand a chance for legislation enactment (Kingdon 2011).

According to Kingdon (2011), a window may open for many reasons. It may open when there are developments in the political stream or when a new problem has emerged and attracted the attention of government authorities and those surrounding them. Change in the political stream may be change in the administration or change of the national mood (Kingdon 2011). New administration is the greatest key to the opening of the window. It grants some groups and other policy actors an opportunity to push for their proposals which they may not have had with the preceding administration, while closing doors for other participants (Kingdon 2011). The change of any political actor may also open a window. Changes occurring in the political stream do not come with specifics of what needs to be done; they only indicate which problems call for proposals (Kingdon 2011). A window may also open in those critical times when a problem requiring an urgent solution emerges. Focusing events also open the window (Kingdon 2011).

A window opens for a short time only and there are reasons why it closes. According to Kingdon (2011), it may close because policy actors may assume they have solved the problem either through decision making or enactment. It may also close because of the failure of policy actors to get appropriate solution so they avoid wasting time on one issue and attend to other problems. It may also close when factors that caused its opening such as a crisis have passed (Kingdon 2011). Turnover in personnel also results in an opening of the window. Authorities come and go changing opportunities as they do so. The failure to find a suitable proposal may also be the reason for a policy window's closure (Kingdon 2011). If a window closes before action, it is likely that it will not open for a very long time.

2.4.3.3 Limitations of Kingdon's agenda setting theory

Kingdon's theory have been criticised by different scholars. Sabatier (1991) argued that Kingdon treated "policy analysts and researchers as too apolitical, thus neglecting the role of advocacy analysis and putting too much distance between the policy and political stream". Kingdon has been criticised for treating policy analysts and researchers as if they are not political. Sabatier

(1991) argued that “if the theory can be expanded, attention must be given to the fact that there is an intergovernmental dimension in both policy formulation and implementation”. Tiernan and Burke (2002:88) have also argued that Kingdon’s theory “has inevitable limitations of models that seek to impose order on dynamic events”. Tiernan and Burke (2002:88) have argued that although Kingdon’s theory has limitations, it remains useful and “provides an accessible general framework in describing and explaining policy processes and forces at work in competition for agenda status”.

2.5 Conclusion

This chapter has provided the theoretical framework for this study. Different agenda settings theory have been discussed with the focus on Kingdon’s agenda setting theory which is the theory guiding this particular study. The relationship between agenda setting and public policy was explored. It has been argued that public policy is the outcome of policy making process. This process is composed of different stages which form a policy cycle. Agenda setting is the first stage in the policy cycle.

Theories examined in this chapter have argued that participants in agenda setting process involve actors from both within the government and outside the government. They include of government authorities such as the president and ministers, media, interest groups, policy entrepreneurs and so on. All these actors have an important impact on the agenda settings. Kingdon’s agenda setting theory presented three streams which are the problem stream, policy stream and political stream. He argued that for a policy change to be experienced, these streams have to be coupled together.

CHAPTER THREE: LITERATURE REVIEW

3.1 Introduction

This chapter provides an overview of the energy situation in South Africa. It provides an energy history from apartheid times to the present. It points to Eskom as the state energy entity responsible for ensuring energy supply. It outlines the struggle of Eskom to sustainably supply the country with electricity by discussing in details the energy crisis in the country. It also discusses the impact of energy on development. It further discusses the strategies aimed at solving the energy crisis which led to the discussion of hydraulic fracturing as one of the alternatives the country is currently considering. It provides a definition of hydraulic fracturing and explores the use of hydraulic fracturing in different countries including South Africa. It further explores the debates around hydraulic fracturing. The moratorium on hydraulic fracturing is discussed and tracked back to 2011. Finally, the chapter outlines the legislation governing hydraulic fracturing in South Africa.

3.2 Energy in South Africa

In the 20th century South Africa became the first African country to introduce electric street lighting in Kimberley. Around 1886 the country initiated mining in Johannesburg which contributed positively to the economic development of the country. It was in this period that the first electricity reticulation system was established in Johannesburg which was generated through steam engines (Writer 2015). However, steam engines did not generate sufficient energy to sustain mining operations. Mining companies retaliated by partnering in the building of small power stations that supplemented the existing power. In 1906 small power stations were substituted with centralised power stations which were introduced by Victoria Falls Power Company (VFP) (Eberhard 2007). VFP generated power from Victoria Falls.

In 1922 the Electricity Act was passed which led to the establishment of Electricity Supply Commission (ESCOM) in 1923. Since then, the country's power supply has gone through many transformations: many giant power stations were built in different provinces including coal stations which were built to respond to energy crisis which faced the country in 1960s (Kenny 2015). In 1987 the country revisited the Electricity Act and the Eskom Act was passed which

resulted in the renaming of ESCOM to ESKOM (Writer 2015). Eskom, as a state-owned enterprise, has been the dominant actor in the electricity sector ever since. It generates 95% of electricity in the country and also has a full control of the national transmission system (Pegel 2010).

3.3 Energy sources

The economy of South Africa is mostly based on the utilisation of energy sourced from fossil fuels like coal and other renewable potentials such as hydropower, wind power and solar irradiance (Giglmayr 2013). Energy production in South Africa is dominated by coal fired stations: in 2006 93% of electricity was produced from coal while 4.2% came from nuclear power and the remaining 1.3% from hydropower (Giglmayr 2013). In 2015, coal continued to dominate the production; it was estimated that over 92% of electricity in South Africa was generated from coal whereas 6% was from nuclear (Kenny 2015).

3.3.1 Coal

Coal has been the dominant source of energy in South Africa and it is assumed it will remain dominant until 2020 due to the unavailability of alternatives. About 251 million tonnes of coal was mined in South Africa in 2009, of which 185 million tonnes was utilised in the country (Environmental Economic Accounts 2012). Sixty million tonnes was exported at a value of R31 billion, while 30 billion tonnes was reserved. The country had approximately 55 billion tonnes of coal reservations in 2002. It was predicted that the available coal would sustain the country for approximately 200 years. However, in 2008 the estimates went down to 121 years based on the rates of extraction (World Bank 2008).

Coal used to produce electricity for local industries and households has been considered cheap and easy to mine. About 53% of coal is extracted from opencast mining operations (Giglmayr 2013). Coal has been reliable in previous years since South Africa had massive reservations and giant coal fired power stations. A disadvantage of relying on coal is carbon dioxide emissions (Environmental Economic Accounts 2012).

3.3.2 Crude oil and petroleum products

South Africa imports oil from Middle Africa from countries such as Nigeria, Egypt, Angola, Saudi Arabia, Iran, Kuwait, the United Arab Emirates, Yemen, Qatar, and Iraq. This is because South Africa does not have enough oil reservations. It produces petroleum products by refining crude oil, extracting liquid fuels and gas from coal and processing natural gas to liquid fuels. Petroleum products refer to products like oil, petrol, paraffin, gas, diesel, aviation gasoline and liquefied petroleum gas (Environmental Economic Accounts 2012).

3.3.3 Gas

South Africa produces a limited amount of natural gas. The little it has is generated off the coast of Mossel Bay. Sasol also extracts gas from coal and some of it is imported from Namibia and Mozambique (Giglmayr 2013).

3.3.4 Renewable energy

A renewable energy strategy was developed in 2010. This includes the processing of biomass and other natural resources such as wind and solar energy. Biomass includes the burning of logs to produce heat. The energy produced from biomass can be used in industries and households for purposes of cooking and heating (Environmental Economic Accounts 2012). One of the efforts to increase energy supply in the country includes the development of solar equipment to generate more power from readily available solar energy. Solar energy is mostly utilised by the Department of Water Affairs for pumping water for the rural water provision and sanitation programme. South Africa has the capacity to produce approximately 36 217 GWh solar-thermal power per year (Adam and Fig 2011). A wind farm started in 2010 in Port Elizabeth managed to supply Nelson Mandela Bay by 2012 with 10% of electricity and could supply about 80 000 households with green energy (Sustainable Energy Africa 2015).

3.3.5 Nuclear power

South Africa in 2011 announced its intention to increase nuclear electricity by 9,600 MW. The country was already producing 1,844 MV from nuclear at that stage (Adam and Fig 2011). South Africa intends to invest in more innovative technology that could increase the country's capacity to generate more nuclear energy (Eskom 2012).

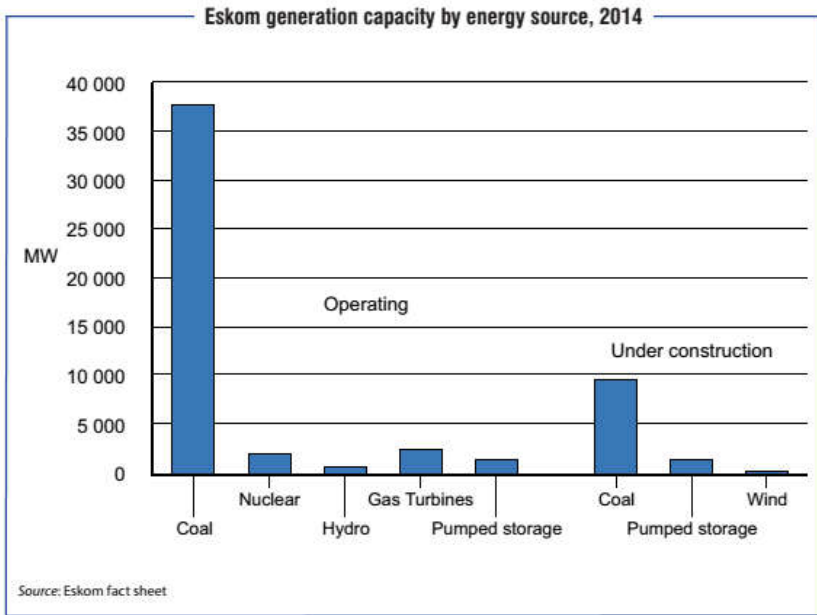


Figure 1: Eskom energy sources (Kenny 2015, 4)

3.4 Electricity supply

The electricity sector is dominated by the state-owned enterprise, Eskom which is responsible for generation, transmission and distribution of electricity throughout South Africa (Kenny 2015). It generates over 95% of South Africa's electricity. Municipal power stations and other independent power producers (IPPS) provide the remaining 5%. Eskom fully assumes the responsibility of transmitting electricity from power stations to 'centres of demand' and from here, Eskom and municipalities equally distribute electricity to final consumers, most of which is consumed by industries (Kenny 2015 and Pegel 2010).

3.5 Energy crisis in South Africa

The electricity sector has been faced in recent years with the challenge of undersupply (Pegel 2010). In 1990s Eskom had the capacity to meet the demand but in 1994 when the government introduced a mass electrification programme, thousands more households had access to electricity and therefore increased the demand. Economic growth and industrialisation have also resulted in an increase in energy demand (Pegel 2010). The country has been struggling to meet electricity demands which has resulted in blackouts and which has severely impacted the economy (Giglmayr 2013).

Since 1987 the energy demand has increased by 230% whereas the supply has only increased by 190 %. For the period of 2006-2009, over 8000MV capacity was not available (Giglmayr 2013). 2008 marked the year of energy crisis in South Africa (Joffe 2010). In 2008, Eskom had the capacity of close to 40 GW while the demand was about 36GW leaving only a 10% reserve. In that year power shortages were experienced across the country which severely affected the economy. The impact was estimated around USD 282 million (US Energy Information Administration 2008). The problem was attributed to government policy which was introduced in the late 1990s and poor management (Pegel 2010).

Policy provided for Eskom to operate like a business in a competitive manner. It did not allow Eskom to build new power stations nor did it allow the private sector's involvement in energy supply. By the time it was predicted that the country would need to increase its energy generation capacity to meet the demand, it was too late (Joffe 2010). It was predicted in 2010 that in 15 years' time the electricity demand would double and to meet the demand, Eskom would need R300 billion to extend the power infrastructure in the next decade (Pegel 2010). President Jacob Zuma in his State of National Address on 12 February 2015 announced that the country was going through energy crisis again (Joffe 2010).

3.6 South Africa's strategies to address the energy crisis

To respond to the crisis, the Department of Minerals and Energy (DME), in partnership with Eskom, in 2008 passed a policy named National Response to South Africa's electricity shortage. The intention of the policy was to increase Eskom's capacity to meet its demand (DME 2008). Programmes such as the 19,000 MW generation capacity expansion programme were introduced (DME 2008). This included the building of two coal fired power stations and the exploration of co-generation and renewable energy options. The policy introduced another programme called Power Conservation Programme. The aim of this programme was to minimise power demand through "power quota allocations, penalties and incentives" as a short-term strategy. For medium term, the strategy was about encouraging consumers to save electricity; this was done through advocating for utilisation of solar water heaters and energy saving bulbs. The new policy intended to employ cleaner energy generating strategies (DME 2008).

The country has built three power stations called Kusile, Melupe and Ingula. These stations are believed will generate approximately 10 000 megawatts. The country is also employing renewable resources; about 3900 megawatts of energy have been generated in 2015 from renewable sources. Eskom also established Sere Wind Farm which had generated 100 megawatts in 2015 (Wild 2015).

According to Minister Gugile (2015), the government intends to secure 2600 megawatts of hydro- electricity capacity from the SADC region. For the long-term energy master plan, the government intends to pursue gas, petroleum, nuclear, hydropower and other sources as part of the energy mix. The country also intends to explore shale gas in the Karoo region. It further initiated the Operation Phakisa Ocean Economic initiative which could produce more energy. South Africa also plans to engage in the nuclear building programme which is expected to generate 9600 megawatts. South Africa has partnered with Democratic Republic of Congo in the Grand Inga Hydro-electrical Project which it is assumed will generate over 48 000 megawatts of clean hydroelectricity, of which South Africa will acquire above 15 000 megawatts (Wild 2015).

3.7 The relationship between energy and development

Energy products are considered products like any other products which could be sold. Energy could be utilised for fuels or could be diverted into other energy products like petrol. It could also be exported to other countries. It could be used in industries to produce non-energy products (Environmental Economic Accounts 2012).

South Africa's development is influenced and shaped by Eskom's economies, social and environmental footprint (Eskom 2011). It influences development through its electricity sales. It also has a considerable effect on the country's GDP through its operational and capital expenditure. It contributed about 3% in 2011 to the economy. Eskom also influences the establishment and running of industries by supplying them with electricity and through its localisation programme. Eskom has shown its commitment to creating opportunities for South Africans to participate in the economic initiatives. About 50% of its total expenditure is awarded to Broad-Based Black Economic Empowerment (BBBEE) supplies. Most importantly, a

reliable and sustainable supply of electricity is what drives the economy of South Africa. The failure of Eskom to provide electricity may have a negative impact on the country's economy (Energy Research Centre 2004).

Eskom also has a large impact on the employment sector. It is considered one of the major employers and customers of goods and services in the country. It has been identified as both a direct and indirect employer. It has more than 129 000 employees of which about 40 000 are directly employed by Eskom while others are employed by Eskom's suppliers (Eskom 2011). About 516 000 family members benefit from these jobs. Eskom continues to create new employment in its new building programmes, manufacturing, construction, business services and other industries (Eskom 2011).

Eskom also has a significant impact on local communities; it is committed to providing job opportunities to local communities. It offers training and employment to people in communities where construction is taking place. Eskom projects also develop good infrastructure like roads, rail, telecommunication, sewage and other infrastructure in local communities (Eskom 2011).

3.8 Hydraulic fracturing

This section will begin by describing hydraulic fracturing and explaining this technology. It will further provide a history of hydraulic fracturing, the experiences of different countries and the debates among opponents and proponents of this technology. It will end by focusing on South Africa's journey which has led to the passing of the moratorium on hydraulic fracturing.

3.8.1 Conceptualizing hydraulic fracturing

Hydraulic fracturing, sometimes referred to as fracking, is a technique employed by engineers to extract gas from underground. In this process, a mixture of water and other chemicals are used to pressure and fracture rocks. The pressure forces natural gas to flow back to the surface from shale rocks or other types of rock formations (Healy 2012). This technique involves boring vertically into the earth until shale rock containing gas is reached; once the rock has been reached the drilling goes horizontally to fracture the rock. When the rock has been fractured, a

mixture of water, sand and chemicals is injected into the hole to pressure the gas out of the rock to the surface where it is collected (CBNCAfrica 2014; Davis 2012).

3.8.2 History of hydraulic fracturing

Hydraulic fracturing was first introduced in the United States. The US implemented a number of pilot projects in the early 1970s; in 1977 the country approved the implementation of hydraulic fracturing which was to be carried out in the tight sandstone formation (Forbis and Kear 2011). Its implementation began in the late 1990s in different places like Colorado, Wyoming, Utah and Texas. It raised strong controversy among residents where it was implemented as people were concerned about health problems and water and air contamination (Jaspal and Nerlish 2014).

3.8.3 Hydraulic fracturing in other countries

3.8.3.1 United States

United States, since the introduction of hydraulic fracturing, has moved from importing natural gas. It has produced enough energy to satisfy the country's domestic needs and a surplus to export to other countries. Since the US deployed hydraulic fracturing more than a decade ago, more than 30 % of natural gas has been produced and is estimated to increase to over 50% in 2035 (Griffith 2011).

3.8.3.2 United Kingdom

The exploration of shale gas was initiated in the United Kingdom (UK) in 2007. Cuadrilla Resource, the company licensed for exploration, estimated that about 5.6 trillion cubic metres of shale gas could be generated from Bowland located under Lancashire. If exploited, it could solve Britain's energy problem and reduce its dependence on imported fuel (Jaspal and Nerlish 2014). UK started deploying hydraulic fracturing in 2011. Tremors measuring 2.3 on the Richter scale were experienced in Blackpool and led to a moratorium on hydraulic fracturing in June 2011 (Cho 2015). However, in April 2012 the UK government announced the lifting of moratorium on hydraulic fracturing which took place in December 2012.

3.8.3.3 Germany

In 2010, Germany government tabled its intention to initiate hydraulic fracturing but this was very controversial (Griffith 2011). Many people formed antifracking groups and what they

called *Gegen-Gasbohren*. Different initiatives led to the sharing of information about hydraulic fracturing and after three months, the majority of people in the area were fighting for its moratorium until it could be ensured that fracking was a safe process (Schirrmeiste 2014).

3.8.3.4 France

France became the first country to enact a moratorium after facing strong opposition from the public environmental groups. France was intending to frack the Paris Basin, considered very fertile land by farmers (Weile 2014). The French government angered the public by granting drilling permits without prior public consultations and debates. After this incidence, antifracking groups pushed hard for enactment of laws that would permit public participation when giving out permits for exploration of natural gas. They also expressed their concern regarding the chemicals employed during fracking and their likelihood of contaminating underground water (Griffith 2011).

3.9 Debates around hydraulic fracturing

The implementation of hydraulic fracturing has generated considerable controversy among the public, civil society groups and professionals. Countries like United State of America, France and South Africa faced strong opposition from the public and because of this, South Africa and France had to impose moratoria while more research was being conducted on hydraulic fracturing (Good 2015). However, South Africa became the first country to lift its moratorium on this policy alternative (Boudet, Clarke, Bugden, Maibach, Roser-Renouf & Leiserowits. 2013).

3.9.1 Opponents of hydraulic fracturing

In the US, most environmental groups and some officials were concerned about the effects hydraulic fracturing could have on public health (Lewiński 2016). The argument was that the chemicals employed during its process have the potential to contaminate drinking water which could endanger the public's health. Apart from this, they were worried that this process uses a large amount of water and the US did not have strong policies protecting water. They wanted these policies to be amended so that they could provide for hydraulic fracturing process and consider the chemicals employed during the process. Anti-fracking groups, the public and local governments were concerned by reports on water pollution and the environmental effects resulting from hydraulic fracturing process (Davis and Hoffer 2012).

South Africa is also experiencing this strong opposition for the same reasons. The main concerns are around the large amount of water used which is mixed with dangerous chemicals, how this will be disposed and its chances of contaminating the water. Hydraulic fracturing would take place in the Karoo of South Africa where the population is dependent on the water accessed from the semi-arid Karoo basin. People worry that their scarce water will be contaminated (Hedden, Moyer & Rettig 2013).

South Africa is one of the driest countries (approximately 495 mm rainfall in a year) in the world, especially in the Karoo region (less than 100 mm of rainfall annually), which is why water is the concern (Lewiński 2016). The US is reported to have utilised about 15 million litres of water for each well. Where will South Africa get that amount of water from, since the country is already struggling to supply its population with water? About 21% of the population in rural areas does not have access to improved water sources. In addition, it is already predicted that the country will need to increase its water capacity as the demand will grow due to population growth, urbanisation, agriculture and mining industries (Hedden et al. 2013).

3.9.2 Proponents of hydraulic fracturing

Supporters of hydraulic fracturing in the US were arguing that it is the best option when compared to coal as hydraulic fracturing emits less carbon dioxide. It is argued to be a cleaner source of energy (Kirkland 2010; Wang, Chen, Jha & Rogers 2014). Hydraulic fracturing has also contributed to an increase in energy reservation, employment and economic benefits in the US (Davis and Hoffer 2012). The US is currently the largest generator of natural gas in the world and has minimised carbon dioxide (CO₂) emissions in a short period of time by 12 % since 2007 (Hedden et al. 2013).

South Africa assumes it will gain the same benefits from hydraulic fracturing as the US. If the shale gas production is effectively managed, it could lead to the achievement of the country's developmental goals. Shale gas production could solve the country's energy crisis and result in a production of more sustainable and readily accessible energy (Wait and Rossouw 2014; Hedden et al. 2013). South Africa also considers natural gas to be a cleaner energy alternative producer when compared to coal. It is expected that hydraulic fracturing could result in a short-

term reduction in CO₂ emissions in South Africa. Shale gas production could be a large source of revenue through taxation from private investors (Hedden et al. 2013).

South Africa is estimated to have approximately 390tcf (71.1BBOE) of shale gas which could completely change the experiences of the country (Fig 2012). South Africa's consideration of hydraulic fracturing was based on and influenced by the National Developmental Plan (NDP). The NDP stated that the country will pursue hydraulic fracturing if it is assumed it will bring more economic benefits and impact less negatively as compared to depending on coal or nuclear power (Hedden et al. 2013).

3.10 Moratorium on hydraulic fracturing in South Africa

The government of South Africa, since 2008, has been trying to find laws that would support hydraulic fracturing. This is evidenced by the fact that numerous laws have been amended several times including the MPRDA and the National Environmental Management Act 107 of 1998 (NEMA) (du Plessis 2015). People opposing government's decision to implement hydraulic fracturing based their argument on that it would impact negatively on the environment and their health and the government did not have strong legislature to protect them (Griffith 2011).

To address the public's concerns related to water contamination and environmental impact, the Minister of Mineral resources released a moratorium in 2011 on exploration licenses while investigations were done on the impact of this process on the environment, drinking water and other issues (Hedden et al. 2013; Griffith 2011). The Department of Mineral Resources in 2012 authorised a task team to explore the possible negative impacts that hydraulic fracturing could have on the economy and the environment (du Plessis 2015). The task team established that there is a chance that the underground water may be polluted. Another concern was for the disposal of contaminated water and the issue of transporting large amount of water for long distance was raised (du Plessis 2015). The task team acknowledged that hydraulic fracturing could create job opportunities, increase revenue income and reduce the country's reliance on other forms of fossil fuels (du Plessis 2015).

In August 2012, South Africa lifted the moratorium, making it the first country to reverse this (Hedden et al. 2013; Griffith 2011). However, the moratorium was reversed before the public's

concerns had been addressed. The government of South Africa focused its argument on the potential benefits of hydraulic fracturing based on the experiences of Europe and the US: hydraulic fracturing would increase employment opportunities, energy security and reduce carbon dioxide emissions (Fig and Scolvin 2015).

The Minister of Mineral Resources on 15 October 2013 announced a draft regulation detailing the standards and procedures to ensure safety in exploration and exploitation of petroleum. The regulation incorporated ideas from the public gained during public participation processes related to shale gas production and exploration (du Plessis 2015). The Minister of Mineral Resources had to issue a second moratorium on hydraulic fracturing in February 2014 since government had not reached an agreement on the issue. To respond to those who were not in support of hydraulic fracturing, an interdepartmental task team was established to discuss issues related to this process. The Portfolio Committee on Mineral Resources in May 2015 demanded relevant laws and another report on hydraulic fracturing (du Plessis 2015). The government announced GN R466 in June 2015 which provides the standards and procedures for the onshore exploration and production of petroleum (du Plessis 2015).

3.11 A legislative framework for energy in South Africa

South Africa is governed by the rule of law, which is the reason why hydraulic fracturing implementation has been delayed while the government has amended and formulated laws to govern this technology. Different legislation controlling the risks and environmental impacts associated with hydraulic fracturing has been formulated including the legislation providing for the use of water. This legislation will be discussed in relation to hydraulic fracturing.

3.11.1 The Mineral and Petroleum Resources Development Act 28 of 2002 (MPRDA) and the Mineral and Petroleum Resources Development Amendment Act 49 of 2008 (MPRDAA)

The exploration and production of natural gas is governed by MPRDA in South Africa. Section 1 of the Act refers to 'petroleum' as "any liquid, solid hydrocarbon or combustible gas existing in a natural condition in the earth's crust and includes any such liquid or solid hydrocarbon or combustible gas, which gas has in any manner been returned to such natural condition, but does not include coal, bituminous shale or other stratified deposits from which oil can be

obtained by destructive distillation or gas arising from a marsh or other surface deposit". Therefore, shale gas will also be referred to as petroleum since it is a natural gas.

Chapter Six of the Act provides for the rights, applications and issuing of permits pertaining to petroleum resources. Section 70 of the Act authorises the Minister of Mineral Resources to nominate a state department or any other agency owned by the state to conduct tasks within Chapter Six. In 2004, the agency nominated was Petroleum Agency of South Africa (Pty) Ltd (PASA) which was tasked to promote the onshore exploration and production and receive applications.

In Section 79(4), the designated agency is responsible for notifying the applicant if their application is granted and it also must consult the affected parties. It also has to produce an Environmental Management Programme (EMP) which explains how the environment might be impacted and how it will be avoided or handled and how pollution will be handled. Environmental impact assessments have to be conducted and only when the Minister is satisfied with the EMP report can the exploration rights be granted. These requirements are provided in Section 5(4) of the Act. The person granted the right of exploration is expected to comply with the requirements of the authorised EMP. However, Section 4(d) of the Mineral and Petroleum Resources Development Amendment Act 49 of 2008 (the MPRDAA) and Section 5(a) were introduced to replace Section 5(4).

Section 5(a) states that: no person may prospect for or remove, mine, conduct technical co-operation operations, reconnaissance operations, explore for and produce any mineral or petroleum or commence with any work incidental thereto on any area without an environmental authorisation. The new section grants production right from the day the permit is granted.

3.11.2 Mineral and Petroleum Resources Development Amendment Bill, 2013

This Bill was introduced in June 2013. The Bill was introduced to include sections that would provide for hydraulic fracturing (Motala 2013). This Bill amended some sections in MPRDA and MPRDAA. Section 70 of MPRDA was replaced by Section 45 of Mineral and Petroleum Resources Development Amendment Bill in 2013. It transfers power for processing petroleum

exploration and production applications from agency or organ of state appointed by the minister to regional managers.

Section 71(a) of MPRDA was replaced by Section 48 of the Bill. It states that the Minister has the authority to nominate a state agency that will be responsible for accepting, maintaining and assessing geological or geophysical information associating with petroleum submitted in terms of Section 88. The appointed entity is to submit to the Minister the information pertaining to exploration and production of petroleum.

Section 52 of the Bill changed Section 78(1) of MPRDA and it states that the entity granted the permit, holds the right to seek exploration rights in the area related to the permit. The holder therefore no longer has the exploration rights; they have to apply for them.

Section 79(4)(b) of the MPRDA was replaced by Section 53(f) of the bill; it requires the applicant, in terms of Chapter 5 of NEMAA, to apply for environmental approval and provide environmental reports. Section 53(e) of this Bill indicates that in cases where the Regional Manager approves the application for an exploration right, the applicant must be informed in writing of the requirement to apply for a license to utilise water based on the relevant law.

3.11.3 The Mineral and Petroleum Resources Development Bill of 2015

South Africa passed the Regulation for Petroleum Exploration and Production on 3 June 2015 to allow hydraulic fracturing to take place. This regulation was developed based on the Mineral and Petroleum Resources Development Act 28 of 2002 (MPRDA) which provides for rights for exploration and production of petroleum. It provides for the exploration of gas, especially offshore gas. Regulations before June 2015 did not provide for hydraulic fracturing (du Plessis 2015). Section 107 of the Mineral and Petroleum makes this provision in Section 14 of the Interpretation Act, 1957 (Act No. 33 of 1957).

Section 85 of Chapter Six provides that the aim of these regulations is

To supplement the Mineral and Petroleum Resources Development Regulations, so as to prescribe standards and practices that must ensure the safe exploration and production of petroleum. These Regulations apply to onshore exploration and production operations

and must be read with the Act, the Mineral and Petroleum Resources Development Regulations and any other relevant legislation.

3.11.4 The National Environmental Management Act 107 of 1998 (NEMA)

This Act provides guidelines for decision makers on issues that may impact the environment. It defines the environment “as the surroundings within which humans exist and that are made up of (i) the land, water and atmosphere of the earth; (ii) micro-organisms, plant and animal life; (iii) any part or combination of (i) and (ii) and the interrelationships among and between them; and (iv) the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being”. Section 2(4) (a)(vii) of the Act provides that the likely negative impact of a developmental projects needs to be assessed before making decisions. The principles of this Act require that environment degradation and contamination be prevented by all means; if this is impossible this must at least be minimised and the environment must be rehabilitated following any damage. Water used must be recycled or disposed in a way that will not harm the environment (Section 2(4) (a)(iv) of Act 107 of 1998).

Section 2(4)(p) of Act 107 of 1998 provides that a polluter is responsible for preventing the environmental degradation or pollution or dealing with the consequences of the damage. This Act continues to provide implementation management guidelines for environmental development projects.

NEMA was revised in 2008 for the purpose of ensuring that the environmental requirements for mining activities in the MPRDA match the ones provided by NEMA. Chapter Five of this Act requires that environmental impact assessment (EIA) be done to investigate the possible negative effects that may come with the activities and be reported to the Minister of Mineral Resources or any authorised authority (Section 24(1) of Act 107 of 1998).

3.11.5 The National Water Act 36 of 1998 (NWA)

NWA seeks to protect water resources in the country of South Africa. It provides guidelines for preventing or minimising the chances of water contamination or degradation. The Minister of Water and Environmental Affairs is required by Section 38 of the NWA to authorise or determine the controlled activities. Section 37(2) clarifies Hydraulic Fracturing as a controlled

activity which will require the application for a license for using water resources. The license will specify the conditions and the purpose for water use.

The Minister of Water and Environmental Affairs or any authorised authority is directed by Section 28(1)(a) and (d) to take action against the holder of the license who does not comply with the requirements of the license. A responsible authority for granting licenses has the right to do his/her research on the likely impact that may be brought by the proposed project on water resources (Section 53(1)).

Section 28(1) of NEMA gives the companies wanting to conduct hydraulic fracturing, the responsibility of taking appropriate action to prevent water contamination or take remedial measures in cases where the water has been contaminated.

Critical analysis of South Africa's legislation

The country of South Africa did not have an adequate legal framework providing for hydraulic fracturing prior June 2015 when the MPRDA was gazetted. MPRDA with other mentioned legislations are aimed at reducing and managing all the negative impacts that could come with hydraulic fracturing on the environment. However, the protection of the environment is depended on the commitment of the Department of Mineral Resources in ensuring the full enforcement of the country's laws. The South Africa legal framework available is argued by Du Plessis (2015) to be robust enough to ensure that hydraulic fracturing does not result in unwanted results.

3.12 Conclusion

The economy of South Africa is mostly based on the utilisation of energy sourced from fossil fuels like coal and other renewable potentials such as hydropower, solar and wind power. Energy production in South Africa is dominated by coal fired stations. Coal emits harmful carbon dioxide and in addition, relying on coal is becoming risky since it no longer produces enough energy to sustain the country. Based on the negative impact of the energy crisis, the government produced an Act in 2015 and other Acts discussed above that would allow for hydraulic fracturing in South Africa. It is argued the country would benefit by increasing its revenue as well as creating employment opportunities, at the same time as improving energy

security in the country. Hydraulic fracturing is argued to be a cleaner process compared with coal. But it faces considerable opposition since people are concerned about the negative impact it may have on the environment and the health risks from contaminating drinking water.

CHAPTER FOUR: THE PROCESS OF AGENDA SETTING OF HYDRAULIC FRACTURING

4.1 Introduction

This chapter tracks the agenda setting process of hydraulic fracturing in South Africa from 2008 to 2015. It analyses how and why hydraulic fracturing came to be considered as a policy alternative to solve the energy crisis in South Africa. The analysis is guided by Kingdon's agenda setting theory. It will be established if the agenda setting process of hydraulic fracturing reflects that of Kingdon which is divided into three streams (the problem, policy and political streams). In the problem stream, the problem that led to the consideration of hydraulic fracturing as a possible policy alternative is examined. In the policy stream, the policy alternatives that existed in the policy community and different entrepreneurs' participation are analysed. The political stream analyses all the political events and the roles played by different policy participants that led to the consideration of hydraulic fracturing as a possible alternative solution to the energy crisis in South Africa. This chapter will conclude by examining the coupling and joining of the three streams which Kingdon refers to as a policy window.

4.2 Problem stream

In this stream, Kingdon (2011) explained how and why some problems get to be considered while others lose the attention of decision makers. He argued that some problems are pushed by their indicators into the agenda of policy decision makers. Focusing events also attracts the

attention of decision makers or the feedback obtained from monitoring reports of existing programmes may indicate a problem demanding attention. However, for an issue to be considered a problem mostly depends on how different actors interpret it; some actors may define some issues as problems while others may disagree (Kingdon 2011).

4.2.1 Indicator

Eskom, state-owned entity for energy supply, has been facing difficulties in delivering according to its responsibilities, especially from 2008 to 2015. The failure of Eskom to sustain its energy supply has attracted the attention of people who were being affected by its service provision (or lack of) and that of policy decision makers. The decline in Eskom service provision acted as an indicator of the persisting problem. Identified indicators are explained below.

4.2.1.1 Decrease in energy production and increase in energy demand

South Africa started experiencing an energy crisis in 2007. Energy supply was disrupted by the failure of Eskom to meet its energy demands. The crisis reached its peak in early 2008 (Rabobank 2008). On 24 January 2008 Eskom publicly declared the energy crisis. The 2008 energy crisis can be traced back to 1994 which was the end of apartheid regime. The democratic government introduced an electrification programme aimed at electrifying the whole of South Africa. This programme by 2008 had managed to light more than 70% of households (twice the population that had access to electricity in 1994). Economic development was another contributing factor to the increase in demand (Pegel 2010).

On top of increasing energy demand, Eskom's production capacity had decreased. Its capacity was affected by many factors, the first being that Eskom's production equipment was damaged due to inadequate maintenance. They were no longer capable of operating and producing as expected (Rabobank 2008; Tau 2008). The second factor was the inability of coal powered stations to produce energy as anticipated due to heavy rainfalls which resulted in wetting of coal. In addition, Eskom was running out of coal stock piles. Another reason behind the shortfall of Eskom's supply was that its plants were operating near their maximum capacity (Rabobank 2008; Tau 2008).

In 2008 Eskom had the capacity of close to 40 GW while the demand was about 36GW (a reserve of only 10%) (Pegel 2010). The energy problem continued until 2015. According to Mantshantsha (2015), cited in Barker (2015), Eskom's production capacity had been diminishing since October 2014. This graph below (Figure 2) was provided by Eskom to illustrate the nature of the energy problem and shows the energy available for supply versus the energy demanded for the period between 2010 and 2014.

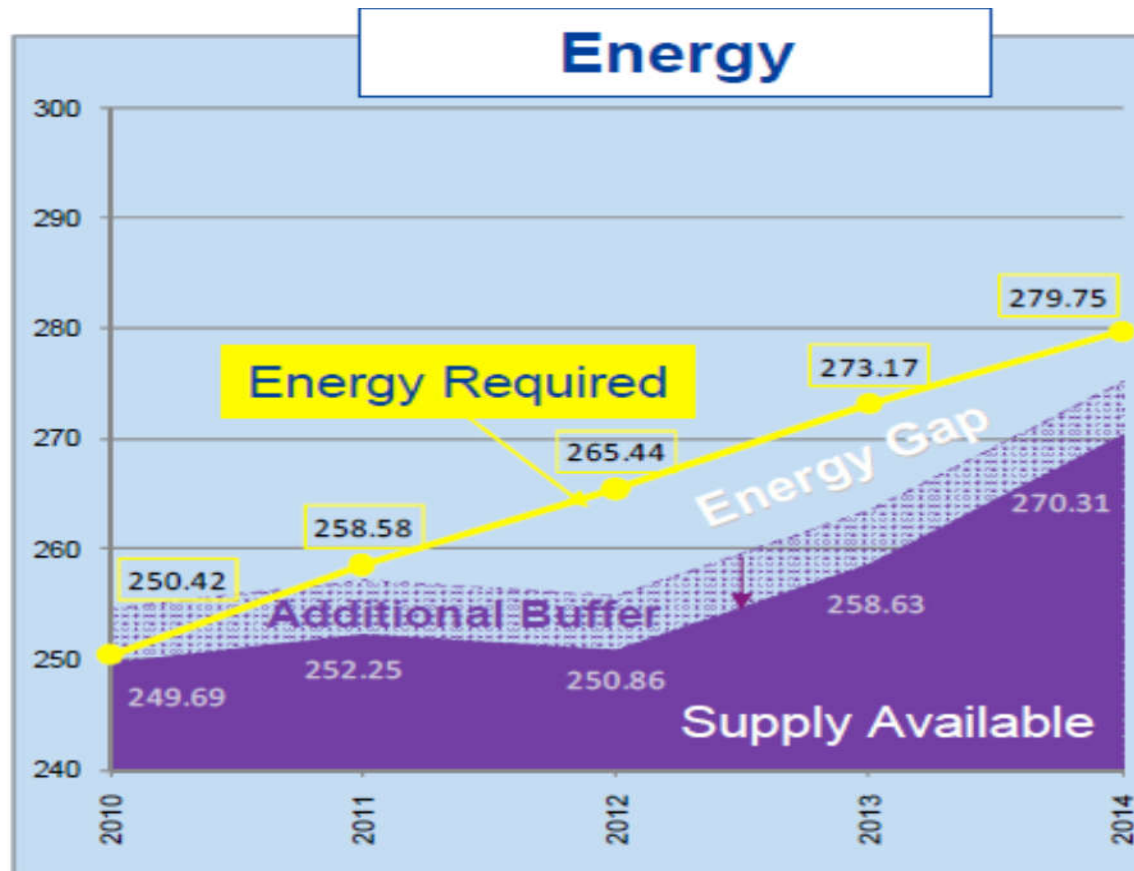


Figure 2: Energy supply versus the demand (Visagie 2010)

Eskom argued that if the gap between the demand and supply was not closed, it could result in undesired consequences which included the inability of Eskom to supply large consumers which could affect the development of the economy; it could also put too much pressure on the electricity supply system and affect the “security of the supply”; it could further force Eskom to resort to open cycle gas turbines which could result in an increase in electricity prices due to

the costs; and it could finally force Eskom to limit its electricity supply to neighbouring countries (Visagie 2010).

4.2.2 Focusing events

To avoid complete blackouts, Eskom introduced load shedding which is the cutting of electricity at a scheduled period in different places (Rabobank 2008). Load shedding was an indicator on its own. Load shedding was estimated to have cost the economy ZAR 50 billion (USD 6.6 billion) in three months in 2008 (NERSA cited in Modimoeng 2008; Barker 2015). During the first quarter of 2008, the economy went down by 4.0% as compared to the previous year which was 5.8% during the same period.

The energy crisis also forced some mining companies to shut down for at least a week. To re-engage in production, they had to volunteer to reduce their energy consumption by 10 % (Rabobank 2008). The mining industry had to cut five years' scheduled investments by between ZAR 16 billion and ZAR 25 billion (NERSA cited in Modimoeng 2008). This severely affected production as well as the economy (Rabobank 2008). According to Baxter, an economist cited in Modimoeng (2008), a 10% energy cut was likely to cost many people their jobs. The mining sector alone has approximately one million employees.

Large companies were also required by Eskom to re-schedule their investment projects until the power supply was back on track' which was likely to be 2012 (Barker 2015). Eskom went as far as requesting 38 large industries to initiate a group that would work together to ensure capacity savings of up to 20%. Finance director Bongani Nqwababa, promised the affected companies that Eskom would be able to supply sufficient energy starting from 2010 according to a 25-year supply deal made in 2006. He however indicated that after 2013, an extra 500MW would be needed (Barker 2015). It was predicted that energy demand would double in 25 years and for Eskom to double the supply would require ZAR1 trillion (Barker 2015).

The country went dark again in 2014. Load shedding was unexpected during that period since Eskom has been engaged in building of new power stations which were supposed to be functioning by then (Munshi 2014). The problem was again highlighted by President Zuma in his interview with SABC News on 26 March 2015 in which he said that the country had been going

through load shedding for a while but new power stations have been built and at least one was meant to be operating fully then. This led to the suspension of the Eskom CEO who the President was blaming for the energy crisis due to his poor management.

According to Kingdon (2011), a problem gets recognised if it is clearly observable that a solution is required. South Africa's energy crisis was demonstrable, everyone was aware of and affected by load shedding. Kingdon (2011) also argued that policy actors demanding policy change had to provide demonstrable indicators that a situation was crucial, providing countable evidence of the magnitude of a problem. This applies to the energy situation. The Rabobank (2008) figures mentioned above indicate the consequences of load shedding on the economy.

Kingdon (2011) argued that indicators are important but the way they are interpreted is more important. The energy situation was interpreted by important actors as a crisis; this is evidenced by the statement of President Zuma in his State of the Nation Address on 12 February 2015 in which he announced the ongoing energy crisis facing the country (Joffe 2010). Kingdon (2011) continued to argue that for a problem to be considered an agent issue requires a push of focusing events like a crisis. A problem has to reach a crisis phase before it is attended to. This applies to energy situation in South Africa; the energy problem had existed prior to 2008, it was never considered an urgent problem before 2008 since it had not reached the crisis state which resulted in load shedding. Load shedding was a strategy employed when Eskom was producing too little to sustain the energy supply to avoid blackouts (Giglmayr 2013). The introduction of load shedding indicated a crisis. The energy problem obtained a space on government agenda because it became a threat to the country's economy. During the period when load shedding was being implemented, services and goods provision and production had to stop. As indicated earlier, an indicator of a problem alone cannot push a problem onto the agenda; it needs to be accompanied by focusing events like a crisis, disaster or symbols. Similarly, focusing events alone hardly manage to push an agenda but accompany the existing perceived problems (Kingdon 2011).

4.3 Policy stream

According to Kingdon (2011), in this stream policy specialists develop numerous proposals which they believe will one day turn into policies. They interact and exchange ideas that can help generate proposals. Kingdon (2011) has argued that this stream involves a community of specialists both from inside and outside of government. These specialists may include researchers, congressional staffers, people in planning and evaluation offices and budget officers, academics, interest group analysts. However, within this community, fragmentation may be experienced if policy specialists do not have common paradigm. When fragmentation occurs, communities may experience instability and conflicts (Kingdon 2011).

Proposals are judged by government officials in terms of their political costs and benefits. According to Kingdon (2011), for proposals to survive they must meet the criteria of decision makers. They have to be technically feasible, which means there should be clear outlines as to how they will be implemented. They should be value acceptable that is they should be in agreement with the values of policy community members. They should also anticipate future constraints. Their costs should also be acceptable. Proposals should be acceptable to both the public and to specialists. Proposals that fail to meet these criteria can be amended to fit the criteria or be merged with something else (Kingdon 2011).

4.3.1 Energy policy alternatives

To respond to the crisis, the Department of Minerals and Energy, in partnership with Eskom in 2008 passed a policy as a national response to South Africa's electricity shortage. The intention of the policy was to increase Eskom's capacity to meet its demand (DME 2008). Programmes such as the 19,000 MW generation capacity expansion programme were introduced and a power conservation programme.

The Department of Energy published a draft Integrated Electricity Resource Plan (IRP) for 2010-2030 in October 2010. It included estimates of electricity demand, potential energy sources and the cost to implement that plan. The IRP also sought to minimise climate change. Electricity generation capacity needed to increase to 52 GWh by 2030 (World Nuclear Association 2016). In early 2011, the IRP was amended with contributions from public consultations and was published in March 2011 by the cabinet. The IRP proposed the country energy generation mix

by 2013 would include: “48% coal; 13.4% nuclear; 6.5% hydro, 14.5% other renewables; and 11% peaking open cycle gas turbine” (World Nuclear Association 2016). Nuclear power was only expected to be included from 2023. In December 2008, Eskom made an announcement indicating it would delay the building of nuclear plants because of limited funds.

Three power stations named: Kusile, Melupe and Ingula were built. These stations are believed would generate approximately 10 000 megawatts using renewable resources (about 3900 megawatts of energy had been generated in 2015 from renewable sources) (Gugile 2015).

South Africa is trying to get away from an over reliance on coal as a source of energy. The country seeks to solve the energy crisis with clean strategies, which is why shale gas is part of the energy generation strategy the country is considering. The country has been influenced by the United Nations Framework Convention on Climate Change’s (UNFCCC) Kyoto Protocol and the 2009 Copenhagen Accord which urges countries to resort to energy production activities that emit less carbon (Munro 2015). Nuclear power was considered but was dismissed due to its expense and risk. Hydropower and other renewable sources are also alternative sources for energy production but due to expense, are difficult to implement on a larger scale (Munro 2015).

4.3.2 Hydraulic fracturing as policy alternative

As indicated earlier, the extraction of natural gas from the shale rock through hydraulic fracturing was considered by the Department of Mineral Resources as one of the alternatives that would be part of the South Africa’s energy mix to solve the energy crisis while not polluting the environment (Motala 2013; Wild 2014). In 1960 oil companies first discovered shale gas in the Karoo but it was only in 2008 when the country was experiencing an energy crisis that the first company (Bundu Oil and Gas) showed an interest in applying for the exploration rights for the shale gas. However, the application was not approved (Cropley 2014).

In 2011 different companies including Falcon Oil and Gas, Shell International, and Bundu (Sunset Energy) submitted applications to the Petroleum Agency of South Africa (PASA) requesting exploration rights for hydraulic fracturing (Motala 2013). These companies wanted to establish if hydraulic fracturing was feasible in South Africa and how much shale gas was

available for exploitation. They would use their findings to advocate for exploitation rights and lobby the government to ensure that hydraulic fracturing became part of a policy from which they would benefit if granted the exploitation rights (Motala 2013).

However, energy production from shale gas is still argued to be not clean. Burning of shale gas emits carbon though less when compared to coal. It is also not a renewable source and its potential to impact on the environment cannot be ignored (Munro 2015). This is the reason why different policy entrepreneurs are against the implementation of hydraulic fracturing. Treasure the Karoo Action Group (TKAG) as a group against hydraulic fracturing has argued that the government needs to consider energy sources that will not contribute to climate change. Climate change must be avoided as it threatens “biodiversity, food security and water supply”. They proposed that to solve the energy crisis and economic challenges, the government needs to consider renewable sources such as wind, solar and wave sources rather than fossil fuels like shale gas which contribute to climate change. TKAG argued that renewable energy sources have worked well for many countries and will do for South Africa (TKAG 2011).

However, the TKAG proposal was regarded as not viable for the present situation (energy and economic crisis). It was argued to be a long-term strategy which could not solve the current problems (Munro 2015). It was also argued that the TKAG did not have a convincing plan as to how their proposal would work, how it would replace the over reliance on coal and how it would solve the energy crisis and increase employment without incorporating other sources like shale gas production in the energy mix. The failure of TKAG to produce a feasible plan was the reason why hydraulic fracturing was considered one of the best policy alternatives to solve the energy crisis (Munro 2015). The advocates of hydraulic fracturing presented practical plans and were able to lobby or attract the interest of relevant policy decision makers.

According to Kingdon (2011), different proposals and ideas in this stream are presented to government officials. The officials and those around them, both from inside and outside the government assess, discuss and debate proposals received. Proposals are judged by government officials in terms of their political costs and benefits. Proposals have to be technically feasible which means they should clearly outline how they will be implemented.

Their costs should also be acceptable. Nuclear power and other renewable sources were considered insufficient and expensive. Advocates of renewable sources also had not provided feasible strategies while hydraulic fracturing advocates had. The hydraulic fracturing proposal was therefore considered as it met the selection criteria of decision makers.

4.3.3 Opposition from interest groups

The Department of Mineral Resources was in the process of granting exploration permits when the public and environmental interest groups opposed the government decision. A number of demonstrators, mobilised by photographer Kian Erikson with the Climate Justice Campaign and Earth Life Africa, were seen in Cape Town streets protesting against hydraulic fracturing (Maditla and Sapa 2011). This is what Kingdon has referred to as community fragmentation which occurs when community specialists have different views. The Treasure the Karoo Action Group (TKAG) was the leading interest group against hydraulic fracturing. This group has invested its resources since 2011 in researching and educating the community about hydraulic fracturing. They also engaged legal courts to fight the government to prevent hydraulic fracturing (Fig 2012).

TKAG managed had massive support from the community as well as entrepreneurs like Johann Rupert and swimmer, Lewis Pugh, legal team and other professionals. Agang SA, a political party, also joined anti-fracking movements (Sapa 2014a). The legal team helped to develop a legal document responding to the Environmental Management Report produced by Shell (Fig 2012). The legal team also filed a complaint to the Advertising Standards Authority (ASA) regarding advertisements made in April 2011 by Shell which were considered 'unsubstantiated and misleading' regarding hydraulic fracturing (Fig 2012).

In October 2013, Mineral Resources Minister Susan Shabangu presented a draft of the proposed regulation to govern hydraulic fracturing. TKAG and AfriForum argued that the regulation was not well informed since there was very little information known concerning the benefits and risk associated with the process (Donnelly 2013 and Sapa 2014b): "We will stand firm against shale gas mining in South Africa, and we will take legal action if we need to, to [get] government to take the right decisions," Kleynhans said, AfriForum's Head of Environmental Affairs. In July 2014 TKAG and AfriForum handed over a letter demanding President Zuma pass

a 30 day moratorium on issuing of exploration licenses. They demanded public participation before exploration licenses were granted as well as more investigations (Sapa 2014b).

By 2014, according to Wild (2014), the South African anti-fracking groups were no longer active. They stopped opposing the government decision since it had been clear that the government was committed to pursuing the exploration regardless of people's concerns. The government wanted to confirm the availability of the estimated 390-trillion cubic feet of natural gas. The government's persistence was based on its commitment to reduce unemployment and increase economic development. The anti-fracker initiatives to stop hydraulic fracturing which involved legal battles only managed to delay its process, not to stop it. However, in November 2015 TKAG announced that after public meetings they had regained the momentum to oppose fracking. They argued that the public should take every opportunity to voice their concerns in hearings linked to Strategic Environmental Assessments (SEA) (Mvubu 2015).

4.3.4 Government initiatives and advocacy strategies for mobilising support

Policy entrepreneurs use different forums to advocate for their proposals. They work hard to mobilise the public and different actors including the policy community who are not supporting policy change. They may do this by providing education aimed at changing the public's thinking to garner their support. They may also introduce their proposals let the public talk about the issue. Civil servants and important appointees may also soften up the public through making as many speeches as possible on the issue throughout the country before the policy is introduced (Kingdon 2011).

The Department of Mineral Resources was forced by the opposition it received from interest groups to pass a moratorium and stop accepting more exploration requests. This was approved in April 2011 by the Cabinet (Motala 2013 and Fig 2012). The Department of Mineral Resources established a task team to investigate the effects of hydraulic fracturing and do public consultations since the opposition was mainly concerned about the environmental effects this process could have. According to Mining Minister Susan Shabangu, hydraulic fracturing suspension was extended for six months to continue with more public consultation. This was after (TKAG) refereed to the Promotion of Access to Information Act to demand access to information from the task team which they argued was not open to the public (John 2011).

In 2012, the task team, led by Rob Jeffrey who was the managing director of Econometrix, concluded its findings on hydraulic fracturing and reported that the shale gas available in the Karoo basin was estimated to be the fifth largest globally and would benefit the country if exploited. The report indicated that hydraulic fracturing could contribute more than 50% cleaner energy than coal (Wild 2014 and Merwe 2014). It could also solve the energy problems experienced in South Africa while contributing to the enhancement of the GDP by creating employment, calling for new investors and new skills, as well as improving the infrastructure (Merwe 2014). In 2012, after the submission of the report from the task team, the Minister of Mineral Resources announced the lifting of the moratorium that was passed in 2011 on hydraulic fracturing (Motala 2013). The minister announced in September 2012 that public participation in fracking issues would be allowed since government policies provide for participation in resource mining (Vecchiatto and Blaine 2012).

The National Planning Commission in its report stated that “shale gas has the potential to contribute a very large proportion of South Africa’s energy needs ... South Africa will seek to develop these resources provided the overall environmental costs and benefits will outweigh the costs and benefits associated with South Africa’s dependence on coal [and] nuclear.” According to Merwe (2014), exploration of shale gas would best be done through hydraulic fracturing only if regulations allow this. The government of South Africa in October 2013 issued draft regulations providing for hydraulic fracturing. The director of the Department of Mineral Resources announced that the exploration of the shale gas would commence once the final regulations were passed. He stated that the final regulations were to be developed based on comments received from the public. President Zuma, in the State of the Nation address, also said “having evaluated the risks and opportunities, the final [fracking] regulations will be released soon and will be followed by the processing and granting of licenses” (Forde, 2014).

In October 2014, the Department of Mineral Resources announced to the National Council of Provinces that it was likely that the regulations for shale gas exploration would be gazetted soon followed by granting for exploration licenses probably in July or August 2015. Pursuing the shale gas remained feasible since it would only be employed for generating electricity not fuel which would be beneficial to the economy (Steyn 2015).

In January 2015, President Jacob Zuma sent back the Mineral and Petroleum Resources Development Act Amendment Bill to Parliament. This was after the Democratic Alliance's parliamentary caucus chair issued the president with a petition in which they were argued that the passing of the Bill would be unconstitutional since public consultation had been unsatisfactory and thus the Bill would be in breach of South Africa's trade agreements (Steyn 2015).

In 2015, the shale gas interdepartmental task team initiated a strategic environmental assessment (SEA) which they claimed was a science-based assessment. This assessment was supposed to be concluded in two years. It was meant to enhance people's awareness and understanding of the dangers and benefits that could come with hydraulic fracturing (Professor Bob Scholes cited in Wild 2015). The Departments of Environmental Affairs, Science and Technology, Water and Sanitation, and Mineral Resources together in May 2015 released a press statement that their interdepartmental task team had found limited information in South Africa relating to hydraulic fracturing which would make it difficult to make an informed decision. They announced that the exploration would continue while the Department of Mineral Resources prepared to release the exploration regulations in a month's time. The interdepartmental task team's argument was the one that influenced the decision to embark on a strategic environmental assessment.

The former Minister of Finance, Nhlanhla Nene announced in a budget speech that R108-million has been assigned for shale gas studies (Wild 2015). The SEA's focal point would be on "biodiversity and ecosystems services, water resources (surface and ground water), geophysics, economics (including agriculture and tourism), spatial planning, national energy planning, waste management, human health, air quality, social fabric, visual, heritage resources and sense of place" (Wild 2015). According to Professor Bob Scholes, cited in Wild (2015) the investigation would be "open for scrutiny by any stakeholder" and he hoped that the government would incorporate the stakeholders' comments. The departments in their media briefing stated that a custodian group would be established to monitor the government initiatives including ensuring that different stakeholders from outside government and the three spheres of government were involved in the processes.

The decision to suspend hydraulic fracturing as investigations were carried out and its lifting reflects Kingdon's argument that proposals meeting the criteria of decision makers get considered and are altered where necessary to meet the selection criteria. The task team was appointed so that their findings could be used to improve the proposed hydraulic fracturing process or terminate it, if necessary. The results produced by the task team indicated the potential benefits for South Africa from hydraulic fracturing; it also outlined what needed to be done and the anticipated future constraints. Based on Kingdon's argument, it is understandable why hydraulic fracturing was reconsidered by the government, considering the potential benefits. However, Kingdon argued that proposals should also be acceptable to the mass public and specialists which was not the case with hydraulic fracturing; the majority of the population, especially those residing in the Karoo, never accepted it. The Karoo residents argued that although the government considered hydraulic fracturing as an "once-in-a-lifetime" development, its negative impact on the environment cannot be denied (Forde 2013; Wild 2015).

All these statements by important authorities indicate that hydraulic fracturing is likely to happen in South Africa. Most of the authorities' statements mentioned the benefits of hydraulic fracturing for the country. According to Kingdon (2011), policy entrepreneurs may use different forums to advocate for their proposals. Civil servants and important appointees may also attempt to soften up the public through making as many speeches as possible on the issue throughout the country before the policy is introduced. Kingdon (2011) also argued that policy entrepreneurs may introduce their proposals or bills and encourage the public to talk and deal with the issue. This is what happened in hydraulic fracturing policy development. The draft regulation was passed in 2013 and people were given the opportunity to discuss and give their views on hydraulic fracturing which were to be incorporated in the final legislation. Also, announcements made on numerous occasions by high profile authorities about this policy alternative were designed to soften up the public.

4.3.5 Community meetings

Kingdon (2011) argued that policy advocates may attempt to soften up the public through providing education, which they can do through congressional hearings in which they can present their proposals and problems and let the public be involved in discussions.

The advocates of hydraulic fracturing, including oil companies and government authorities, have tried to influence the public to accept it by indicating that the technology that will be employed has been proven to be safe and well grounded (Fig 2012). They pointed to the economic benefits, the notion that hydraulic fracturing emits less carbon and would solve the energy crisis. Shell argued that hydraulic fracturing could produce 700 000 jobs for South Africans (Burkhardt 2013; Forde 2013). Shell also assured people that it would not touch water from the Karoo since people were concerned that the Karoo is already a dry area. Shell also consulted the community and disclosed the harmful chemicals that would be used to a committee made of representatives from interested groups (Fig 2012; Maditla and Sapa 2011).

Since the lifting of the moratorium, a number of prospectors have submitted their applications for exploration rights of the Karoo. Royal Dutch Shell was one of the applicants who was prepared to spend more than R1 billion on the exploration of the shale on behalf of the government. It announced that the exploration would take approximately two years. After the exploration, if there is something worth extracting, an Environmental Impact Assessment would be carried out. Hydraulic fracturing would only commence after the completion of the assessment and Shell would be considered by government when granting the permits to implement hydraulic fracturing (Forde 2013).

Shell have been ensuring public participation through holding public meetings and going house to house talking about the hydraulic fracturing process in the Karoo region (Golder Associates 2011). People were allowed to voice their concerns in those meetings; some did it in writing, through emails, fax, post, and telephonically (Golder Associates 2011). Some of people's concerns centred on the lack of water in the Karoo, how fracking would affect their livelihoods including that of farmers, cultural value, water and air pollution, and the ecosystem. In response to people's concerns, Shell promised to consult with experts for clarity. Some people

in the meetings were hopeful that fracking would increase job opportunities and contribute to their community development (Shell 2015).

Falcon Oil and Gas also had public meetings as part of enhancing public participation. One of the meetings in February 2012, in which they announced their interest in exploring the Karoo, did not go well. People residing in the Karoo made it clear that they do not want fracking in their Karoo (du Toit 2015).

Bundu Oil and Gas also participated in public meetings. People who attended a meeting in February 2015 argued that they would not allow fracking since it would not provide employment to the majority of the local residents (du Toit 2015). They argued that the exploration phase would employ experts not community members. Some remained hopeful that fracking would benefit them by developing their communities and creating jobs for the poor (Botha and Yelland 2012).

The government also surprised the public by holding a public meeting for the first time with different stakeholders which they referred to as public consultation. It took the government six years to consider and carry out this public consultation. The meeting took place in the Eastern Cape and most people were not impressed as only twelve people were given the opportunity to raise their questions and concerns and none of their questions were answered by the politicians who were present at the meeting. They argued that the consultation was not genuine since the ANC government had already made a decision to continue with fracking (du Toit 2014).

4.4 Political stream

As indicated in Chapter Two, political spheres may have an effect on the agenda of the government. Change in the administration or national mood may push some problems onto the agenda and remove others. Interest groups can also prevent some proposals from being put on government agenda if they do not support such policy alternatives (Kingdon 2011). Kingdon argued that changes in the political stream have a strong impact on the agenda.

4.4.1 National mood

According to Kingdon (2011), a shift of the national mood may influence the agenda or policy in many ways. The change of the climate within a country may enable some proposals to flourish and remove others from the agenda. A change in national mood can come with a new audience and the opportunity for advocates of new proposals to push forward their ideas. According to Kingdon, the national mood may emanate either from the public or from scholars or the president who may discuss his interests with the public thereby influencing the public opinion.

4.4.1.1 National mood - Government side

The government of South Africa since 2008, through the Department of Mineral Resources and the Department of Water and Environmental Affairs, has tried to amend a number of pieces of legislation including the MPRDA and the National Environmental Management Act 107 of 1998 (NEMA). The purpose for the amendments was to establish one environmental system that would provide for hydraulic fracturing (du Plessis 2015). In 2011, the Minister of Minerals announced the government intention to grant permits for shale gas exploration. During that period, different companies including Falcon Oil and Gas, Shell International, and Bundu (Sunset Energy) submitted their applications for exploration rights. However, they faced strong opposition from the public which was against the granting of these permits (Motala 2013). As Kingdon (2011) has argued, a change in a national mood creates an opportunity for government participants to raise some issues on the agenda while preventing or removing others. In a case of hydraulic fracturing despite the interest of government officials on this process, the national mood (public opposition) forced the government to suspend the issuing of the shale gas exploration permits. Mining Minister Susan Shabangu had to pass a moratorium on this process in 2011 while a task team was established in 2012 to conduct an investigation on hydraulic fracturing (John 2012; du Plessis 2015).

In 2012, after the publication of the task team report, the government announced the lifting of the moratorium (Motala 2013). Since then, the government has indicated its intention to exploit shale gas for the purpose of increasing energy security and job creation (Parker 2013). Since the government has considered hydraulic fracturing, it has received considerable support from government officials (du Plessis 2015). As Kingdon has argued, the public and other

stakeholders outside of government can learn about national mood from politicians and the media. This has been experienced in the case of fracking; government ministers including the president and other important officials have made statements indicating support on different occasions, for example, “We cannot allow a blessing to lie fallow ... If shale gas is one of the blessings, we are going to go for it” (Peter quoted by Sapa 2012). The former Deputy President, Kgalema Motlanthe also stated on 21 August 2013 in parliament that going for shale gas would be a “game changer” for the economy of South Africa.

The Minister of Trade and Industry, Mr Rob Davies announced the government intention to start the shale gas exploration before the 2014 elections (du Plessis 2015). Minister Rob Davies also announced on 22 August in parliament that the exploration regulations would be published before April 2014 (Burkhardt 2013). Molewa, Minister of Water and Environmental Affairs, commented soon after, “I'm not saying I want this personally. I want what's best for our country, including in the water sector [and] the protection of our environment” (Parker 2013). Chief Director of regulations at the Department of Water and Environmental Affairs, Deborah Mochotlhi also said “I'm not saying we're going for fracking. That's a political decision to make. If we go that route we will do everything in our power as water resource managers to ensure that we prevent, mitigate and manage those impacts” (Parker 2013). The Democratic Alliance spokesperson, Marti Wenger also pointed to the benefits fracking could bring especially its potential to create job opportunities for South Africans: “we need to do what is right for the environment and we need to do what is right for unemployed people who could benefit from fracking” (Parker 2013).

The officials in the Mineral Resources department also made various announcements on the shale gas exploration in 2014 which were followed by President Jacob Zuma's speech in his State of the Nation address in which he claimed going for shale gas would be a “game changer” for the economy of South Africa. He said in parliament, “Having evaluated the risks and opportunities, the final regulations will be released soon, and will be followed by the processing and granting of licenses” (Forde 2014).

President Jacob Zuma also presented the government's commitment to shale gas to senior South African and Malaysian officials in Durban in 2014. He stated that the government's intention is to drill 30 exploration wells in the next ten years, claiming that "over the next 20 years, this could lead to the production of 300 000 barrels of oil and gas per day." He said nine-billion barrels of crude oil could provide South Africa with oil for 40 years, "while gas deposits could amount to as much as 11-billion barrels of oil equivalent, equal to 375 years of consumption" (Cropley 2014). Mineral Resources minister, Susan Shabangu repeatedly indicated government's commitment to shale-gas exploration (Wild 2014).

4.4.1.1.2 Legislation development

The ongoing amendments and developments of legislation were also an indication of the government's strong support for hydraulic fracturing (du Plessis 2015; Motala 2013). The draft regulation for Petroleum Exploration and Exploitation, prescribing "standards and practices that would ensure safe exploration and exploitations of petroleum" applicable to onshore and offshore operations was passed by the Minister of Mineral Resources on 15 October 2013. This draft regulation was passed to allow different views and comments be made by all stakeholders. It provides for natural gas, coal-bed methane and shale gas. This draft was developed based on comments from the public participation processes (du Plessis 2015).

The Minister of Water and Environmental Affairs' effort to ensure hydraulic fracturing has also resulted in the publishing of the 'Proposed Declaration for the Exploration for and Production of Onshore Unconventional Oil or Gas Resources or Any Activities related thereto including but not limited to Hydraulic Fracturing as a Controlled Activity' (Motala 2013). The rationale behind this regulation was to ensure that the companies intending to explore the shale gas would be bound to apply for licenses for use of water.

In February 2014, another moratorium was passed by the Minister of Mineral Resources following differences on opinions that existed on hydraulic fracturing between the cabinet ministers. The interdepartmental task team was established to address the concerns of those ministers. However, the moratorium was only for new application; the exploration was to be continued by those companies that had already been granted the exploration permits. The

President and the Minister of Mineral Resources supported hydraulic fracturing because of potential economic benefits, so the current exploration could continue (du Plessis 2015).

In June 2015, legislation governing hydraulic fracturing (GN R466) was passed. This legislation prescribed “standards and practices for the onshore exploration and production of petroleum (including gas, although this is not specified in the draft regulations)” (du Plessis 2015).

4.4.1.2 National mood- Interest groups’ pressure

The government intention to go forward with shale gas exploration and exploitation raised strong opposition and debates among South Africans and even internationally. Environmental activists have raised their concerns on the consequences this process could have on the environment. They argued that this process could contaminate the underground water, pollute the air and endanger biodiversity. They were also concerned about water disposal management. They argued that to prevent negative environmental effects of hydraulic fracturing, government needs to develop clear legislation and a statutory system to govern hydraulic fracturing processes (Parker 2013).

Kingdon (2011) argued that social movements may not be the idea of the general public; they may be organised by organisations or some leaders who may have influence on the policy and such social movements may have considerable influence on the nation’s mood. Kingdon’s argument has been evidenced in the case of hydraulic fracturing. In 2011, immediately after the Minister of Mineral Resources announced the intention to receive applications for exploration rights, strong opposition was experienced. The campaigns were organised by the Treasure the Karoo Action Group (TKAG) (Peek et al. 2014). TKAG invested its resources in public campaigns which were intended to attract public support for opposing the government decision to implement hydraulic fracturing. TKAG invested again in investigating the process and in legal interventions (Fig 2012). The national mood was strongly felt on social media and by the media in general. The members of TKAG were residents of both the Karoo and the large cities. It made coalitions with other campaigns and NGOs but it was the main anti-fracking group (Fig 2012).

Government also faced opposition from farmers. Lukie Strydom and Dougie Stern were farmers who received funds from BKB (a former farmers’ co-operative which markets wool and

livestock) to visit the United States to do research on hydraulic fracturing. When they came back, they were convinced that they do not want their farms to be fracked. They participated in lobbying for the support of other farmers to fight the government decision. Stern, an office bearer of Agri-Eastern Cape, also organised anti-fracking movements (Burkhardt 2013). Different NGOs have worked hard to ensure public participation. The Southern Cape Land Committee has organised campaigns educating farmers about the effects of fracking. The Wildlife and Environment Society of South Africa and the Centre for Environmental Rights have offered workshops indifferent Karoo communities. Farmers and the public became the main opponents of fracking, arguing that it would not create any employment for local residents; rather it would destroy the already existing jobs provided by farms (Fig 2012).

In August 2014, after President Jacob Zuma's State of the Nation Address in July 2014, the TKAG and AfriForum submitted a letter to the president. This letter was substantiated by scientific information that questioned the sustainability of hydraulic fracturing. They demanded another moratorium to be passed on hydraulic fracturing (Peek et al. 2014). The pressure from these groups resulted in the initiation of an ethnographic research project intended to respond to the demands of these groups (Merwe 2015).

4.4.2 Organised political forces

The 2011 moratorium on hydraulic fracturing was influenced by the public campaign organised by the TKAG (Merwe 2015). This reflects Kingdon's argument that emphasised the potential influence of interest groups in removing or preventing some issues or alternatives from obtaining space on the agenda list. According to Kingdon (2011), interest groups are still important in this stream as participants within and around government respond to their activities. He however, argued that organised forces may not stop government officials from pushing an idea onto the agenda (Kingdon 2011), which was the case with hydraulic fracturing.

4.4.3 Government in the political stream

The change in government administration provided an opportunity for advocates of hydraulic fracturing. The government interest to address the energy crisis was noted when the President

Jacob Zuma took over from Thabo Mbeki who had claimed in his State of the Nation Address in 2008 that the energy problem was not a crisis.

According to Kingdon (2011), administration can be composed of three actors which are the president, executive office, appointed politicians in departments and bureaus answering to the president or be any one of these actors. Administration is sometimes more dominant in the policy making process. Their decision is generally regarded as important; if they decide a problem or an issue deserves to be a priority, many other actors are also likely to consider it a priority. Policy advocates with proposals that manage to get the attention of the administration are more likely to succeed in including their proposals in the government's policy agenda list (Kingdon 2011).

Among the three actors in the administration, the President is argued to be the most important. The president can set an agenda alone but the executive branch or the congress or actors outside government cannot do this without presidential buy-in. The power of the administration on agenda setting and on choosing appropriate alternatives, as Kingdon has argued, is evident in the case of hydraulic fracturing. The President and other ministers' support for hydraulic fracturing is the reason why it is likely to be implemented, despite the opposition of other policy actors. The President and other important administrators have made numerous statements in support of hydraulic fracturing as a policy alternative solution for the energy crisis in the country. They have pointed to the benefits that it would bring to the country while solving the energy crisis.

4.5 The policy window and coupling of the streams

A policy window is defined by Kingdon (2011) as a chance for policy advocates to put pressure on government decision makers to consider their policy solution on the problem they feel demands attention. Policy advocates prepare possible solutions and wait for a day when these problems become prominent, which is a time when a window opens and grant them the opportunity to present their proposals. A window opens when there is a change in a political stream. Policy entrepreneurs wait with their prepared proposals at hand for an opening of the window which is often unpredictable (Kingdon 2011).

In the case of this study, the window opened in 2008 when the energy problem became intense, during the period when the country experienced load shedding. This was when the energy problem was considered a crisis that demanded attention. Policy entrepreneurs advocating for hydraulic fracturing saw the window of opportunity and pushed for their proposals. It was discovered decades ago that South Africa had abandoned shale gas which the country could benefit from if exploited but during that time nothing was done since the country did not have problems that could be solved by exploitation of shale gas. When the country began to experience an energy crisis, advocates of hydraulic fracturing, especially companies which would benefit from it, saw the opportunity and presented their ideas to government decision makers.

As Kingdon has argued, a window also opens when there is a change in the political stream that supports the problem and provides a solution. In the case of this study, a change in the political stream was experienced. Important government decision makers like the President and other administrators were interested in solving the energy crisis and were in support of hydraulic fracturing. They considered hydraulic fracturing as a feasible solution to the energy crisis. According to Kingdon, when the three streams are coupled together, it is an appropriate time to address the problem and for a policy change. This is applicable in this case: the energy problem was recognised, and a suitable policy solution was attached to problem, accompanied with a change in the political stream. The window opens when the three streams are coupled together.

4.5 Conclusion

This chapter has presented a discussion on the agenda setting process of hydraulic fracturing in South Africa. Kingdon's three streams (problem, policy and political) were used to analyse the agenda setting process of hydraulic fracturing as a policy alternative. Within the problem stream, it was discovered that the country was experiencing an energy crisis which called for a policy solution. Within the policy stream, different proposals were present which were aimed at solving the energy crisis but hydraulic fracturing was considered a feasible solution to the crisis. There was also a change in the political stream: the problem was a priority to government authorities and they also supported the solution attached to it. However, interest groups and

other actors were not in support of hydraulic fracturing but since important administrators including the President were supporting it, government officials have been able to push their ideas onto the agenda. The coupling of these three streams was experienced in what Kingdon referred to as an opening of the window.

CHAPTER SIX: DISCUSSION AND CONCLUSION

This research has tried to unpack the agenda settings of hydraulic fracturing as a policy alternative to solve the energy problem in South Africa from 2008 to 2015. Guided by Kingdon's three streams of agenda setting, the following questions were answered: How has energy production emerged as a policy issue in SA? How has hydraulic fracturing emerged as a policy alternative in SA? What is the problem environment regarding hydraulic fracturing in SA? What is the political environment regarding hydraulic fracturing in South Africa? What is the potential policy development in the area of hydraulic fracturing?

Kingdon (1995) has argued that for a policy change to be experienced, three streams (problem, policy and political) have to be coupled together. He argued for a policy to be developed, a problem that needs attention has to be recognised and accompanied by developments in the political stream; this implies that a window opens when a problem is recognised and when there is a climate change in the policy stream. Kingdon's theory of agenda setting is evident in the agenda setting process of hydraulic fracturing in South Africa. The three streams, as Kingdon has argued, have coupled which is why the government is now in the process of implementing hydraulic fracturing in its exploration stage.

South Africa has experienced some noticeable indicators of energy supply being a problem. Eskom has experienced difficulties in supplying the country consistently with energy. The demand for energy was too high, especially in 2008 and up until 2015. The energy demand started increasing in 1994 when the democratic government led by ANC took over from the apartheid regime. The new government introduced an electrification programme thus demand has increased while the supply has not. The energy crisis became a concern for many people when Eskom introduced load shedding which is the cutting of electricity for a scheduled period in different places. Load shedding severely affected the economy of South Africa and people's lives. It was estimated to have cost the economy ZAR 50 billion (USD 6.6 billion) during three months in 2008 (NERSA cited in Modimoeng 2008; Barker 2015).

As Kingdon has argued, a problem may receive attention if it reaches a crisis phase. The government and Eskom have been aware of the increase in energy demand for many years but nothing was done until load shedding was introduced in 2008 when it was considered a crisis and its consequences were experienced by everyone. The problem stream was experienced in this case as explained by Kingdon; he argued that for a problem to be considered, evidence of the magnitude of the problem must be provided. The magnitudes of the energy crisis illustrated by the figures indicate the decline in the economy. Kingdon also argued that the way a problem or an issue is interpreted is also important for a problem to be placed onto the agenda. The energy problem was not a priority when Thabo Mbeki was president of South Africa but his successor President Zuma considered it as a crisis that demanded agent attention.

The government of South Africa had to respond to the energy crisis it was facing. Various energy production alternatives to increase the energy supply were considered. The crisis could not be solved by one alternative which is why the government considered an energy mix which included gas, petroleum, nuclear, hydropower, renewables, coal and other sources. The decision to implement this energy mix was influenced by the government intention to move away from relying on coal which is also contributing to the climate change. Decision making processes on the energy production mix included debates, discussions and public consultations. In 2008, policy entrepreneurs (Oil Company) submitted their proposals for implementation of hydraulic fracturing. They argued that the exploitation of shale gas could solve the energy crisis while contributing to economic development. Other policy entrepreneurs were against the implementation of hydraulic fracturing, pointing to the impact it could have on the environment and public health. These disagreements contributed to the delay of the implementation of hydraulic fracturing as a moratorium had to be passed while investigations were being done. Legislation providing for this process also had to be formulated.

Policy entrepreneurs like anti-fracking groups advocated for renewable sources and nuclear power. Their proposals were considered not feasible and did not anticipate future constraints. Renewable sources like solar energy are already part of the country's energy production activities but it is argued this could not be expanded as it is too costly. The same applies to nuclear power. For the country to solve the present energy crisis and avoid future problems, it was

argued that hydraulic fracturing had to be implemented as it was predicted that the energy demand will continue to increase as the population grows. Advocates of hydraulic fracturing argued that if implemented, it would contribute to economic development and create employment for South Africans.

As Kingdon has argued, in a policy stream a number of proposals exist. Policy entrepreneurs wait with their proposals ready to be attached to problems. This was the case with hydraulic fracturing policy entrepreneurs; they submitted their proposals in 2008 when the problem was considered a priority though their proposals for exploration were not granted then. Different alternatives were considered regarding the energy mix. However, conflicts within the policy community emerged as some policy specialists were against hydraulic fracturing. This has reflected Kingdon's argument that within a community, fragmentation may be experienced which is when policy specialists have different paradigms.

Policy entrepreneurs who advocated for renewable resources to be expanded did not win as their proposals were argued to be not feasible and too costly. Kingdon argued that proposals are judged by government officials in terms of their political costs and benefits. He argued that proposals have to be technically feasible, anticipate future constraints and their costs should also be acceptable. Proposals should also be acceptable to the public and specialists which was not the case with hydraulic fracturing. Government decision makers are pursuing hydraulic fracturing without the support of the public, especially those residing in the Karoo. However, Kingdon indicated later in the political stream that public opinion is important in the agenda setting process but is not more important than the President's decision.

The advocates of hydraulic fracturing (oil companies) have also tried to soften up those actors against hydraulic fracturing by providing education, holding community meetings and teaching communities about this process and its benefits. Kingdon's theory can also be applied here. He argued that policy advocates work hard to mobilise the public and different actors including the policy community that is not supporting policy change. They may do this though providing education aimed at changing the public's thinking and garnering their support.

Developments in the political stream were also experienced in the agenda setting process of hydraulic fracturing. As Kingdon has described, a change in the national mood was experienced. The public was opposing to hydraulic fracturing which of course affected its agenda setting process by delaying the process. However, the national mood on the government side was in support of hydraulic fracturing. The President and other important administrators showed commitment to the development of shale gas which was the reason why the window opened despite the pressure from interest groups which were opposing it. The change in the government administration also contributed to the opportunity for advocates of hydraulic fracturing. The government interest to address the energy crisis was evident when the President Jacob Zuma took over from Thabo Mbeki.

The energy crisis experienced since 2008 served as a window for advocates of hydraulic fracturing. The crisis provided the opportunity for them to attach their proposals to the problem. The energy crisis was also accompanied by the developments in political stream. The convergence of the energy problem, hydraulic fracturing as a policy alternative and change in the political stream opened a policy window.

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