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Minerals and Energy
REPUBLIC OF SOUTH AFRICA

OUTCOMES OF THE NATIONAL ENERGY SUMMIT

HOSTED ON
25TH TO 27TH SEPTEMBER 2007

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Abbreviations

APPA	African Petroleum Producers' Association
ASGISA	Accelerated Shared Growth Initiative for South Africa
BBBEE	Broad Based Black Economic Empowerment
BFP	Basic Fuel Price
CBM	Coal Bed Methane
CEF	Central Energy Fund
CER	Certified Emission Reductions
CTL	Coal to Liquid
DME	Department of Minerals and Energy
DOT	Department of Transport
DPE	Department of Public Enterprises
DSM	Demand Side Management
EIA	Energy Information Administration
EDI	Electricity Distribution Industry
ESI	Electricity Supply Industry
EE	Energy Efficiency
EWP	Energy White Paper (White Paper on Energy Policy for the Republic of South Africa, 1998)
GHG	Greenhouse Gases
HDSA	Historically Disadvantaged South African
IAEA	International Atomic Energy Agency
IeC	Integrated Energy Centre
IPP	Independent Power Producer
IRP	Integrated Resource Plan

LPG	Liquefied Petroleum Gas
NERSA	National Energy Regulator South Africa
NGO	Non-Governmental Organisation
NIRP	National Integrated Resource Plan
NNR	National Nuclear Regulator
NOC	National Oil Company
RED	Regional Electricity Distributor
REFSO	Renewable Energy Finance and Subsidies Office
REMT	Renewable Energy Market Transformation
SADC	South African Development Community
SASDA	South African Supplier Development Agency
SAWEP	South African Wind Energy Programme
SWH	Solar Water Heaters
TRECS	Tradable Renewable Energy Certificates System

EXECUTIVE SUMMARY

The Minister of Minerals and Energy hosted the National Energy Summit from the 25th to 27th September 2007. The Energy Summit was the first for the country and marked the start of a process of deliberations for the review of the White Paper on Energy Policy for the Republic of South Africa which was published in 1998. The Energy White Paper was given effect with a 30 year outlook on the energy landscape of the country and a review interval of 10 years.

The National Energy Summit was attended by various stakeholders within the energy sector, and active participation of all stakeholders was encouraged throughout the proceedings. Some of the key stakeholders that attended the summit included representatives from unions, municipalities, state-owned entities, Government Departments, environmentalists, civil society, non-governmental organisations, public entities and general members of the public.

The thrust of the topics which were deliberated on during the summit was on the five basic objectives of the Energy White Paper, namely:

- Improving access to energy services
- Improving energy governance
- Stimulating economic development
- Managing energy related environmental impacts
- Securing supply through diversity

The Energy White Paper was developed in 1998 based on a number of assumptions which were relevant and valid at the time. It was very forward looking and was directed by a combination of the global economic environment as well as the vision of South Africa in response to that environment. The global and national landscape has changed significantly since 1998 and as a consequence some of the principles which underpinned the assumptions may no longer be valid. The deliberations of the summit sought to highlight key policy positions or statements from the Energy White Paper which needed

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consideration, with the key focus being on testing the relevance of each, policy position and understanding implementation challenges or areas where there had been deviation from the original policy position. This included assessing whether the current policy position or approach was delivering on the objectives of the country as well as testing for current relevance by reviewing the principles and assumptions which underpinned that policy position. By identifying key barriers or challenges to implementation, proposals or recommendations made needed to take consideration of the prevailing local and global socio-economic environment and eminent changes.

The Energy Summit Booklet seeks to outline the key outcomes from the proceedings of the National Energy Summit with the intent of highlighting key proposal or stakeholder positions which emanated from the deliberations of the various topics during the Summit. The target audience of the Energy Summit Booklet is all those stakeholders that attended the Summit as well as those that did not. In a sense, the booklet is targeted at any party who is affected by energy policy within South Africa. A process of ongoing deliberations and mini-summits will be conducted as a process of further engaging stakeholders and refining the process of reviewing the Energy White Paper.

The structure of the booklet is as follows:

The first section of the booklet, Summit Opening, summarises the welcoming and introduction of the Summit. It includes key messages which were delivered by the Ministers and the Deputy President, as well a opening addresses by the Directors General of Minerals and Energy, Public Enterprises and Transport. These opening addresses set the scene for the Energy Summit at a high-level and defined the context in which key issues needed to be addressed during the summit proceedings.

The second section of the booklet, Summit Proceedings, forms the core of the booklet and highlights the key outcomes from each summit session. In this section, the key Energy White Paper policy position as it relates to each topic is presented, this is then analysed based on the presentations and various

stakeholder comments which were made during the proceedings. As far as possible the key points which were deliberated are summarized and the key recommendations or outcomes are extracted and presented.

The third and last section of the booklet, Summit Closure, outlines the Energy Summit declarations. It also summarises the statements which were made by the women and youth representatives respectively and lastly summarises the closing remarks by the Director General and the Minister.

The Department made a declaration to commit to the following:

- improving cooperation and coordination between the South African Government departments as well as all spheres of government to ensure integrated planning;
- for the South African Government Departments and all three spheres of Government to support institutional arrangements for transformation as well as effective regulation of the Energy Sector; and
- for the Minister and the Director General of Minerals and Energy to develop policies that take into account the inputs and the insights that would emanate from the proceedings of the summit.

SECTION 1: SUMMIT OPENING

1. Introduction

The Energy Summit Booklet outlines the outcomes from the proceedings of the Energy Summit which was hosted by the Department of Minerals and Energy (DME) from the 25th to 27th of September 2007. This document's intent is to highlight the key proposals or stakeholder positions which emanated from the deliberations on various topics during the Summit.

The Department of Minerals and Energy (DME) held, at the behest of the Minister, its first Energy Summit from the 25th to 27th September 2007. The main purpose of the Summit was to embark on a process for the review the government's premier policy paper on energy; the White Paper on Energy Policy, which was released in 1998. The White Paper was given effect with a 30-year horizon of energy policy and a review interval of ten years to ensure its relevance to prevailing circumstances.

One of the main aims of the Energy Summit was to afford all stakeholders to participate in this first step towards the review process for the 1998 Energy White Paper. The process was completely inclusive and all key stakeholders which included Unions, Municipalities, State Owned Enterprises, Government Departments, Environmentalists, Public Entities, Non-Governmental Organisations as well general members of the public, participated actively during the deliberations of the Summit proceedings.

In order to maintain some measure of neutrality of input and to ensure that all stakeholder views were considered with the same weighting, sponsorship of this event was limited to State Owned Enterprises. Topics for discussions were based on key energy policy statements from the Energy White Paper with the thrust of the topics being the five basic objectives of the Energy White Paper, namely:

- Improving access to energy services

- Improving energy governance
- Stimulating economic development
- Managing energy related environmental impacts
- Securing supply through diversity

The Energy White Paper was developed in 1998 based on a number of assumptions which were relevant and valid at the time. It was very forward looking and was directed by a combination of the global economic environment as well as the vision of South Africa in response to that environment. The global and national landscape has changed significantly since 1998 and as a consequence some of the principles which underpinned the assumptions may no longer be valid. The purpose of the sessions and the topics which were discussed during the Energy Summit were therefore aimed considering questions for certain policy statements, and deliberate with a focus on the following:

- Asses whether the current policy position or approach was delivering on the objectives of the country
- Unpack and review the principles and assumptions which underpinned that policy position
- Test the validity and relevance of those principles and assumptions against the prevailing South African and global environment?
- In the case that the policy was implemented, identify the key challenges which were faced during its implementation as well as implementation gaps that may potentially still need to be addressed
- Consider the changes in the local and global socio-economic environment, and propose the changes that should be made to the policy to make it relevant to South Africa within the context of the current environment, including the key assumptions underpinning that policy proposal

It was also important to highlight that it was not all White Paper policy positions that were up for discussion at the Summit. The focus of the Summit programme

was therefore on those policy positions that had either not been implemented or from which there had been a deviation or major challenges.

2. Welcome

2.1 Welcome by Session Co-Chairs

The co-chairs of the conference, Ms Nelisiwe Magubane and Mr. Nhlanhla Gumede welcomed the guests and highlighted that the Energy summit was a process of reviewing the Energy White Paper of 1998. They indicated that the Energy White Paper clearly stated that its intent was to give direction in terms of energy policy for a period of thirty years, which started in 1998 and a review interval of ten years. They also indicated that the Energy Summit would be a first step of a series of summits which would provide those who could not attend this summit an opportunity to participate in the process of reviewing the Energy White Paper.

2.2 Welcome Remarks

Ms Mahlangu, representing the Gauteng Premier, Mr. B. Shilowa, made the opening remarks for the conference. Some of the key messages from her speech are outlined below.

The Gauteng Province had to take a very keen interest on matters of sustainable energy supply because Gauteng is the economical engine of South Africa and of the African continent and that as a result had a particular and important role in the issue of sustainable energy. As a province that was regarded as South Africa's economy powerhouse and a province that contributes to a third of the growing Gross Domestic Product, the importance of sustainable energy supply to economical growth and social development broadly for the people of the province was well understood.

In addition to the depletion of resources as a result of an increase in population growth and economic growth she highlighted the need for an increased focus on energy efficiency for households. Population growth and immigration into the province exacerbated the challenges of electrification and that this became

apparent when people in formal settlements who did not have access to electricity and other basic services initiated protests in addition to challenges of electrification in informal settlements.

The Province was currently looking at an integrated Provincial strategy and that the Energy Summit was therefore critical in guiding the common approach to find solutions to the challenges of sustainable energy provision in the Province as well as in the country as a whole. Gauteng needed to achieve environmental sustainability in the medium to long term and highlighted that although it was the smallest province in terms of size, it was one of the highest polluters in the country. There was a need for the Province to have to work with National Government in a coordinated and integrated manner on these and other issues.

3. Minister's Opening Remarks

The Energy Summit was officially opened by the Minister of Minerals and Energy, Ms Buyelwa Sonjica. The following section outlines some of the key aspects which the Minister mentioned in her opening remarks.

The Minister defined energy as the engine of economic growth in any economy and indicated that energy was a vital input into production. She added that this meant that if South Africa was to move to a feasible higher growth rate, then all energy stakeholders would need to ensure the reliable availability of energy, particularly petroleum products and electric power at internationally competitive prices, in adequate quantities and appropriate prices accessible to all. She further added that if South Africa were to enjoy economic growth and development for all, then to achieve this, access to safe, clean and convenient forms of energy at the least cost in a technologically efficient, economically viable and environmentally sustainable manner would be essential.

The Minister indicated that global energy consumption was growing, with a significant portion of that growth coming from emerging economies, which of course includes South Africa. She also highlighted that energy poverty, which was faced by many in developing economies including our own, was contributing

to the unsustainable use of the limited energy resources. The Department of Minerals and Energy's role was to ensure that that economic development and its commensurate use of energy, was done in a sustainable manner.

She added that about 75 % of the South African economy was coal-energy driven and that this was likely to remain the case in the foreseeable future. This, she added, placed coal as a strategic resource for energy in the country and at present this particular resource was unregulated.

The Minister indicated that the cornerstone of the energy policy was universal access to cleaner and safer energy carriers; she added that electricity was one such energy carrier and should be made accessible as widely as possible.

The Minister made reference to the audit report on eleven electricity distribution utilities which had been released by the National Energy Regulator of South Africa (NERSA) earlier on in the year. She indicated that the report showed that the distribution industry's operations were sub-optimal with significant backlogs on infrastructure maintenance. She added that this posed a serious challenge for the restructuring of the electricity industry in the country and called for the acceleration of the Electricity Distribution Industry (EDI) restructuring process and that the EDI Restructuring Bill would be presented to Parliament before the end of the year in line with the Cabinet decision of 25 October 2006 in terms of which the EDI would be restructured into six wall to wall Regional Electricity Distribution (REDs) as public entities managed through the Public Finance Management Act and regulated by NERSA. She further indicated that the REDs would offer economies of scale and the advantages of focused and ring-fenced electricity businesses, however she pointed out that the legislation to put it all into effect was taking some time as it involved the transfer of assets from the municipalities and Eskom to the REDs, which led to a loss in revenue for some of the municipalities. She indicated that as a consequence, the legislation had been a subject to much debate and was expected to undergo several amendments before it was implemented.

She indicated that energy efficiency measures remained the cleanest form of energy that could be introduced and implementing Energy Efficiency measures that result in a decrease in energy consumption was directly correlated to a reduction in environmental impacts and a bottom line monetary saving. In conclusion she highlighted that the DME had a target of achieving savings due to energy efficiency practices and by implementing various programmes and initiatives.

4. Key Note Address by the Deputy President

The Deputy President, Ms Phumzile Mlambo-Ngcuka delivered the key note address to the summit via teleconference as she was abroad on business matters. She emphasised the fact that energy security was high on the political agenda and that increasing the total generation capacity of the country was a high priority. She further highlighted the need for South Africa to focus on climate change issues as they played a significant part of the energy debate. She also pointed out that Government leaders were concerned as all importing industrialised countries warned of the detrimental impact that high oil prices have on the individual economies and on the world economies.

The Deputy President further indicated that as developing countries grow their economies so do their need for energy, and that the lack of sufficient energy could limit the economic growth of a country. This, she added, necessitated the DME to implement solutions that had been identified and to ensure success of those initiatives as energy was a catalyst for shared growth. She highlighted that DME was the best place to deliver on most of the issues highlighted by President Mbeki in his state of the Nation Address earlier on in the year, where he reminded the country of its key challenges which included amongst others, intensifying the fight against poverty, addressing the challenges of the second economy, providing of basic services and reducing the cost of doing business in South Africa.

The Deputy President highlighted priorities for the Government's Programme of Action, some of which included the Industrial Policy Implementation Plan, which

in turn included implementing an intensive campaign on energy efficiency and saving, an increased focus on energy security and the maintenance of key energy infrastructure. She indicated that the Government's Programme of Action also included Human Resource Development which in turn incorporated the implementation of anti-poverty campaigns amongst others. She emphasised the fact that there were still six million poor households in South Africa and that Government together with business, civil society and labour needed to focus on plans to rescue these masses from poverty. She further indicated that providing energy services to women was the single most reliable weapon against poverty for humanity.

In conclusion, the Deputy President indicated that the objectives of the energy sector remained the same and were still relevant and outlined in detail that much work still needed to be done with respect to each of them.

5. Key Messages

While the Deputy President and the Minister of Minerals and Energy's addresses were more general and set the scene for energy issues at a broader level, the following speakers focused on key sectoral issues that needed to be addressed and established the context of key intergovernmental and sectoral factors that needed to be considered during the deliberations. The key topics discussed were as follows:

- An overview of energy policy and the role of energy in the economy, by the Director General of the Department of Minerals and Energy, Advocate S Nogxina;
- Energy related infrastructure development for South Africa, by the Director General of the Department of Public Enterprises, Ms P Molefe; and
- Transport and energy security, by the Director General of the Department of Transport, Ms M Mpofu.

5.1 An Overview of Energy Policy and the Role of Energy in the Economy

The Director-General of the Department of Minerals and Energy's message focused on giving an overview of the key objectives of the energy policy as well as the role of energy in the economy. The Director-General's speech started off with a review of all the objectives which are as follows:

- Increasing access to affordable energy services
- Improving governance of the energy sector
- Stimulating economic development
- Managing environmental impacts
- Security of supply through diversity

The Director-General indicated the need to find a balance between sustainable development, economic growth, the environment and security of supply. With regard to increasing access to affordable energy services, he indicated that this remained the number one objective for any developmental state and that without access to energy it was impossible to improve the quality of life. He emphasised that progress on this objective was heavily dependent on close cooperation amongst all the three tiers of Government as well as between the DME and other government departments. He also pointed out that although great strides had been made, universal access by 2012 remained a key challenge as it was difficult and costly to provide infrastructure in deep rural areas.

The Director General made reference to the Energy White Paper's stance on governance of the energy sector, which indicates that the operations of public institutions must be more accountable and more representative. He indicated that in line with this objective, the DME had restructured the Central Energy Fund (CEF) and separated the commercial aspects from the nationally strategic aspects. He also indicated that the National Energy Regulator of South Africa (NERSA) had been established, although strengthening of the entity was still

required. He also added that representation of Historically Disadvantaged South Africans (HDSAs) in the liquid fuels sector was still disappointingly low despite the implementation of the Charter since 2000.

The Director General indicated that stimulating economic development was an ongoing task which consisted of the promotion of competition and cost reflective pricing, and he added that while private sector participation was encouraged, and current legislation was intended to remove trade barriers by encouraging open access to energy infrastructure, the Government was still responsible for providing critical infrastructure which was the backbone of the economy.

The Director General pointed out that the DME was actively participating in all platforms seeking to address global warming and other environmental concerns as the management of environmental impacts had taken a higher national profile as energy was a key contributor. He also indicated that fuel specifications and other standards had been developed or amended in response to these important issues, but however quantitative measures were still needed to evaluate the success of these and other interventions. He highlighted that the DME would need to focus on clean coal technologies and a nuclear energy policy health strategy was currently underway.

The Director General pointed out that the Energy White Paper assumed increased opportunities for energy trade within the Southern African Development Community (SADC) region as a means of securing supply through diversification and that it placed great emphasis on commercialisation and competition, while acknowledging that competitive energy markets need a sophisticated regulatory environment. He indicated that experiences in other competitive markets had shown that markets work well in situations of over capacity and that South Africa's energy policy should therefore seek to be compatible with the Regional Energy policy which would have to be balanced with national interest. He highlighted that the assumptions underpinning this positioning had since changed and in certain cases may no longer be relevant. He emphasised that in deliberations during the summit, the continued validity of

key assumptions and policy positions of the White Paper would need to be interrogated and if need be new targets set.

5.2 Energy Related Infrastructure Development for South Africa

The Director General of the Department of Public Enterprises, Ms Portia Molefe's speech focused on the energy related infrastructure development plan for South Africa. She indicated that the Energy Summit was long overdue and that the State needed to have a more active role in energy matters. Her presentation focused on the following issues: the world electricity, South Africa electricity, Eskom capacity outlook, acceleration of the Build Plan and the South African Power Projects.

She indicated that this increase in the price of coal could make it possible for nuclear to be competitive when compared to coal as in certain parts of the world, the price of nuclear was decreasing. Furthermore she indicated that this convergence of the coal and nuclear prices was one of the factors that led to the decision of increasing nuclear in the South African energy mix.

She indicated that South Africa was very energy intensive and that discussions with the Department of Trade and Industry (DTI) needed to be held in order for Government to establish the type of economy that the State wanted to create and hence drive the types of energy intensive projects that the country should undertake.

Ms Molefe further indicated that in line with the Cabinet decision of 2004 which stipulated that for all new capacity, 70% must be from Eskom and 30% from Independent Power Producers (IPPs), the DME had awarded the contract for two Open Cycle Gas Turbine (OCGT) plants. She also indicated that the price of electricity was not sustainable.

Ms Molefe emphasised that the key challenges in the short-term included the issue of reserve margin.

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5.3 Energy as a Strategic Commodity

Mr. Frans Baleni, General Secretary from the National Union of Mineworkers delivered a speech which focused on the positioning of energy as a strategic commodity for South Africa.

Mr Baleni indicated that the South African economy had been highly depended on mining and the export of minerals, in particular gold and that one of the key challenges facing South Africa was to transform South Africa from a mining-based economy towards that of high value-added manufacturing and services. He also however, pointed out that this did not suggest that mining had become irrelevant and raised his concern about the references which were made about the nuclear vis-à-vis coal. He indicated that South Africa still had coal reserves of over 300 years and therefore there was still a need to mine that coal.

He indicated that when the new Government came into power, one of the key focus areas was market liberalisation, however as time went on there was a realisation that not all challenges which South Africa was facing could be address through this approach. He highlighted that the shortage of skills still remained a challenge and that effective training was critical if energy was to be positioned as a strategic tool. He also indicated that this would enable for transformation within the energy sector to be achieved in the true sense.

In conclusion, Mr Baleni indicated that women were required in the energy sector if it was to grow and that a process of creating quality jobs was required. He indicated that a better life for all was needed and that this would be possible through energy, however the key challenge remained in the implementation. He indicated that it had become very urgent to foster economic development with the State taking the lead and the market supporting through an industrial strategy. He indicated that the unemployment and poverty had reached unacceptable levels and that a sustainable democracy required economic growth which would translated into job creation and hence a better life for all. *"Anything is possible with energy"*.

5.4 Transport and Energy Security

The Director General of the Department of Transport's speech focused on the role of transport within the energy sector and the need to ensure cooperation between the Departments of Minerals and Energy and of Transport in their respective planning processes. She indicated that it is important to ensure alignment of planning efforts between the two Departments as the absence of joint planning creates an environment of deterioration.

Ms Mpofu highlighted that the energy sector relies heavily on the movement of product for which the Department of Transport (DoT) is responsible for providing. She indicated that wwithout an upfront informed basis of conducting transport planning, the DoT would not be able to adequately plan for the future.

Ms Mpofu highlighted the role that the private sector could play in addressing some challenges that the Government was faced with. Ms Mpofu raised the point that energy security should not be viewed in isolation but in support of other government programmes. She indicated that the summit should not conclude without some form of solution with regard to the transportation of energy products and pointed out the need for the energy sector to participate in various forums to ensure sustained growth and maintenance of transport infrastructure and that commitment must be made to ensure an integrated planning platform to ensure the needs of the energy and mining sectors in general to be met by the Department of Transport.

SECTION 2: SUMMIT PROCEEDINGS

The following sections outline the proceedings of the different sessions which were held during the summit. The sections are categorized according to key topics which were discussed during the summit. Where position papers were submitted as part of the topic, policy statements from the Energy White Paper are evaluated in the context of the topic. Key material representing various stakeholder inputs includes presentations which were made during the summit as well as comments which came from the floor during the proceedings. As far as possible, each section should include the following:

- The chair and panel members of the session
- Purpose of session
- Key policy position relating to topic (as it stands in the EWP)
- Assessment of Policy which includes an evaluation of whether the approach undertaken delivering the objectives of the country and if not why this is the case. This also includes a high-level outline of the key principles and assumptions underpinning the policy position.
- The key outcomes from the energy summit cover the proposed review of the policy in response to local and global socio-economic environment (as well as other key assumptions or dynamics). More importantly it also incorporated assumptions, positions and views raised by stakeholders during the summit.

6. Cross-Cutting Topics

6.1 US National Energy Modeling System

Ms Susan Holte, Technical Assistant to the Administrator and Deputy Administrator at the Energy Information Administration (EIA), delivered a paper "US National Energy Modeling System" (NEMS). She was invited in response to the DME's interest in developing a South African National Integrated Energy Modeling System (NIEMS), which is based largely on the American NEMS.

Ms Holte explained the EIA's mission, history, mandate, and its independence. She explained that the mission of the EIA is to provide policy-neutral data, forecasts, and analyses to promote sound policy making, efficient markets, and public understanding regarding energy and its interaction with the economy and the environment. She also explained that the EIA was created in 1977, and is the statistical agency of the U.S. Department of Energy. She also indicated that the EIA does not participate directly in the regulation of policy making, although the information and analyses produced by the EIA is used by the decision makers. She pointed out that the EIA was independent from the Department of Energy and that the Administrator of the EIA is the only person who has to approve data analyses produced by the EIA.

She discussed the products and services and the data they collect and explained that the EIA had maintained a number of models over the years which included short-term energy models, international energy models, one long-term model a variety of sectoral/fuel specific models. She explained that the EIA now maintained three energy modeling systems: the Regional Short-Term Energy Model, World Energy Projection System/System for the Analysis of Global Energy Markets, and the National Energy Modeling System (NEMS).
The focus of the presentation was on the Mid-Term Domestic Model, which includes the NEMS, and has a time horizon of up to 25 years.

Ms Holte indicated that in 1990, there was a call for a new National Energy Modeling System and the Office of Integrated Analysis and Forecasting was created in October 1991 to initiate this. Component design reports were subsequently prepared for each module and sub-module and these were integrated in a modular structure. NEMS is written in the FORTRAN programming language, which was used in the original development of the systems.

The NEMS was first used to provide analyses and forecasts for the *Annual Energy Outlook 1994*, which was published in January 1994, and had forecast horizon up to 2010. NEMS was also extensively used for special analyses of

proposed legislation, topics including carbon dioxide emission reductions, efficiency standards, fuel specifications, and tax credits, among others. Many analyses required additional model capabilities and it was also used by some external firms.

Ms Holte also explained at a high level other features of NEMS, these included that NEMS is a large, regional energy-economy model of the United States, and also includes international trade of energy; it represents all energy supply, conversion, and demand in a unified, but modular system; it is designed to provide for both baseline energy projections as well as scenario analysis; and it provides the *likely* projected energy future, under a given set of assumptions, not an *optimal* energy future. She also indicated that all outputs from NEMS analyses are made available on the EIA website (www.eia.doe.gov) and include *Annual Energy Outlook*, with text, tables, graphics, including detailed supplemental tables, as well as analysis reports and model documentation and an annual assumptions report.

Ms Holte also explained each of the NEMS modules. These are the Demand Modules (residential, commercial, industrial and transportation); the supply modules (oil, natural gas and coal); the petroleum markets modules; the electricity generation module; the integration module and the international energy module.

Ms Holte also highlighted some strengths of NEMS, which included that it allowed modeling to a high level of detail and that its modular nature allowed the flexibility. However she also highlighted some weaknesses which included that vast amounts of data were required because of the level of modeling detail that it provided, and that like many model there were challenges with meeting specifications of new and emerging technologies. Another added element applicable in the US is the different impact of political divisions amongst different States. Linkages to the world energy market remained a challenge. The model was developed in FORTRAN which is an outdated language and this posed additional risk if the skills for this were to become more scarce.

Ms Holte also indicated that the structure of NEMS was closely tied to the U.S. energy market, and that NEMS was not a "system" in which one can change a few parameters and represent a different country or State. However she indicated that Canada had adapted it to model their energy system.

In conclusion, Ms Holte indicated that in considering the applicability of NEMS to South Africa, some key questions would need to be asked. These included understanding the policies that needed to be addressed; the structure of the South African energy system as well as the economy at large would need to be considered. Essential to the successful implementation of the model would be the collection of the necessary data, developing the expertise to use and understand the model. She also indicated that a model is never complete and that continued maintenance and calibration was required in order to ensure that it adequately represents the system which it is intended to represent.

6.2 Improving Governance of the Energy Sector

The session dealt with the difficult question of defining regulatory independence. The deliberations sought to answer questions about the separation of policy and implementation aspects by analysing the linkages between regulatory independence, regulatory discretion and regulatory certainty demanded by investors.

6.2.1 EWP Policy Statement

"Governance of the energy sector will be improved. The relative roles and functions of the various energy governance institutions will be clarified, the operation of these institutions will become more accountable and transparent, and their membership will become more representative, particularly in terms of participation by blacks and women".

6.2.2 Summary of Deliberations and Key Outcomes

One of the views that emerged was that governance involves separation of specific activities into two primary levels.

At a political level (parliament and ministers), governance involves:

- Policy making
- Legislation (which includes laws and regulations)
- Budget allocations.

At the implementation level (Government Departments, agencies, regulators and state-owned entities), governance involves:

- Licensing of new projects
- Regulating tariffs in natural monopolies
- Creating level playing field for market participants

One of the major drawbacks to coherent policy formulation and regulation throughout government has been that the White Paper was not incorporated into the shareholder compacts of the state owned enterprises. It is necessary to ensure that the objectives of the Energy White Paper are included in the shareholder's compact since policy and shareholding are managed by different departments. One way of doing this would be through an integrated energy planning approach which incorporates energy governance as well inter-departmental joint planning.

Some other thoughts were that the fundamental economic goal of regulation is "*to mimic a competitive market outcome, even when the underlying market is not competitive*"

Another view indicated that regulatory independence could be understood upon comprehension of three main tasks of a regulator, which are to:

- Protect consumers (by avoiding non competitive prices)
- Provide for the industry viability (allowing regulated companies the opportunity to recoup their costs and obtain a reasonable return)
- Implement government policies

It was explained that the rule of law was key and that regulators needed to explain their decisions. It was also pointed out that the independence of

regulators rests in the fact that their decisions can only be overturned by the courts and this in turn makes it difficult for the poor to access fair regulations as only the courts can overturn unfair actions by regulators or anti poverty regulations from court. The following paragraphs discuss more specific issues which were covered on this subject.

Separation of policy making and regulation

It was highlighted that Government will always have a strong role to play in relation to regulation of the energy industry and that it was important to separate between the role of the regulator and that of government. This would in turn clarify the differences between the roles of policy making and policy implementation, where:

- Policy making refers to providing input into political and economic policies that inform laws and regulations; and
- Policy implementation refers to the practice of taking policy as given by statute of Ministry rule and implementing regulations to put that policy into effect.

Regarding international best practices, there was strong consensus that the role of the regulator should be limited to policy implementation. This would result in a more disciplined regulator, who must work within a given set of parameters to achieve a fair and neutral outcome;

It was also pointed out that by contrast, a regulator that was too involved in the policy making process had incentives to affect policies for the sake of determining a specific short-term outcome rather than acting to ensure the long run viability of public policies; and that too much involvement in policy might affect the perception of how "independent" a regulator might be.

Another view was that the public perception of regulation however could be improved if regulations were seen to be aligned to public policies. There appeared to be a conflict, however in the current legislation where in terms of the

Petroleum Products Act, for example, the Minister of Minerals and Energy is both the policy maker and the regulator.

Independence of regulators

Other views which were raised were that, in order to facilitate private sector involvement, the independence of the regulator was of utmost importance and Government must take a leading role in energy planning to promote competition in the energy sector. Government policies must be clear to avoid confusions during the implementation.

Regulatory independence is a dynamic issue which transforms over time as a democracy evolves and as the confidence levels of the public in independent regulators grows. The key is to find the right balance.

Extent of discretion afforded to regulators

It is essential to ensure regulators have discretion and have their role properly defined in some of the energy strategies such as the Energy Security Masterplan. NERSA's role, for example, should be defined in these broad energy strategies and the regulator should be given allowance to exercise its discretion on certain issues within the given policy framework but its actions should not be dictated by short-term reactions to challenges. Adequate discretion will avoid detailed regulations that attempts to incorporate every eventuality.

Transparency in policy making and regulation

Transparent processes prevent abuse and therefore give certainty to regulation. Government should consistently apply regulations to both SOE's and private players alike, especially when it comes to monopolies as, for example, publicly owned monopolies do not behave differently from privately owned ones.

Creation of an enabling operating environment ensures effectiveness of regulation. Some of the aspects which defined an enabling environment are:

- The legal system: International experience shows different outcomes depending on common and civil law frameworks

- A solid regulatory compact fortifies the reliance on the regulator
- The length of time that the regulatory system has been in place
- Consistency of decisions made by different governing political parties over time

The basis of regulatory certainty

All aspects discussed above, if well executed, will result in credibility and therefore regulatory certainty which is not built overnight. This can be supported by well written procedures and methodologies which can potentially reduce the extent of discretion that would need to be exercised on the part of the regulator.

Input from Position Paper

The position paper which was submitted by the DME on this topic outlined some of the major strategic objectives of the independent energy regulator as follows:

- To establish appropriate processes, procedures and systems to implement the Petroleum Pipelines Act;
- To licence existing and new activities in the piped-gas and petroleum pipeline industries;
- To facilitate access to the petroleum pipeline infrastructure;
- To develop and implement appropriate pricing and tariff approaches for the piped-gas and petroleum pipeline industries;
- To promote investment in the energy sector;
- To promote BEE and competition in the energy sector and to develop memorandum of understanding with government departments and other regulatory authorities with overlapping/concurrent jurisdiction;
- To effectively contribute to the socio-economic development programmes of government; and
- To develop regulatory rules and practices for efficient and effective regulation of the energy sector.

6.3 Energy Pricing for Development and Eradication of Poverty

The key question that this session intended to discuss was how the best energy prices could be set in order to promote development. Discussions included general principles for pricing for all energy carriers with the intention of answering the question of whether as an economy taxes should be applied at this primary level or whether energy should be made as cheap as possible to stimulate growth in downstream sectors.

6.3.1 EWP Policy Statement

"Government policy is to remove distortions and encourage energy prices to be as cost-reflective as possible. To this end prices will increasingly include quantifiable externalities."

6.3.2 Summary of Deliberations

A view was that prices ensure the most efficient allocation of scarce resources and therefore the process of price formation and determination was critical to avoid distortions in the market place. Market failures are normally due to incorrect, asymmetrical information and as such some pricing interventions were necessary to correct market failures and distortions, and these could be implemented through Government interventions such as taxes and subsidies. In most cases the failure of markets to allocate resources is an indication that:

- Market prices do not reflect social cost and that
- Market profitability does not reflect social benefits.

To date, current interventions have indicated that the benefits of promotion of access to energy accrue to middle income and urban households with little or no benefit to the poor. This is mainly due to low affordability and lack of actual access by poor households e.g. not connected to the electricity grid. Some of the key causes to this are outlined below:

- The overall financial benefits to the poor are small as they consume a lot less energy than richer households

- Price caps below market clearing prices results in higher income households accumulating most of the subsidised supplies, this in turn also encourages corruption and smuggling
- Further exacerbating the problem is that once introduced, these subsidies are difficult to phase out

It was also pointed out that subsidisation was not effective if energy was used inefficiently. Some of the effective means of lowering the cost of energy for the poor is improvements in areas such as efficient house construction and equipment designs.

In considering low income households, it should be noted that there are low-income households without access to electricity and there are low-income households lacking clean fuels for cooking and heating applications. The two groups are often lumped together when energy for low-income households are discussed. Additionally, it was pointed out that certain studies which had been done on this subject indicated that that energy for electricity and heat are different, the study indicates that:

- to overcome poverty, focus should be placed on heating requirements. The focus should be on clean fuels and on end-uses such as cooking;
- poor people do not cook on electricity; and
- providing electricity without addressing thermal requirements will not result in poverty reduction in rural areas.

6.3.3 Key Outcomes

The following outlines some of the key recommendations which were made by various stakeholders with regard to the topic.

Electricity

Electricity is the desired fuel for households and Government needs to investigate the possibility of subsidising appliances. The implementation and

impact of Free Basic Electricity needs to be carefully monitored and implemented.

Liquefied Petroleum Gas (LPG)

- The Value-Added Tax (VAT) subsidy on Illuminating Paraffin should be transferred to LPG.
- Awareness campaigns need to be implemented to rectify consumer perceptions.
- Contractors should be established in areas which are undersupplied with LPG.
- Cylinders, appliances and fuel should be subsidised in a pilot project to determine impact.
- The possibility of integrating the LPG programme with the Photo-Voltaic (PV) programme should be explored.
- A programme for exchanging and collecting cylinders should be implemented.

Illuminating Paraffin (IP)

- VAT zero rating should be abolished
- The IP distribution chain should be abolished
- IP should be pre-packaged
- Compulsory safety standards for IP appliances should be enforced

It can be concluded from above that the strategy of maintaining low energy prices to in support of economic development is not sustainable and may lead to many distortions and inequalities in the long term. Subsidies which are intended to help eradicate energy poverty must be carefully designed, well targeted and be of limited duration and regularly monitored. Efforts should be made to include externalities in energy costs. Energy prices will however be even higher if externalities are considered.

6.4 Competition in Energy Markets is the Best Approach to Delivering Energy Services

This session opened the debate on deregulation of the liquid fuels industry and the energy sector as a whole. The key question that needed to be answered was whether an open market and competition would deliver best prices for the consumers.

6.4.1 EWP Policy Statement

"Government will encourage competition within energy markets."

6.4.2 Summary of Deliberations

One presentation indicated that there are many schools of thought in this arena. One school of thought is that there is no need for regulation to increase competition in the energy market and that removing regulation does not influence competition for the market. The South African liquid fuels market is oligopolistic and given the current constrained logistical capacity in this industry, it is not conducive to make it a market-driven industry. Given this structure of the oil industry, healthy competition can therefore be much more effectively influenced by a regulation regime.

Another school of thought is completely against competition and it states that competition will increase the prices of energy services and can have a negative impact on the poor and only favours the wealthy. Given the centrality of energy to economic and social development, supply of energy must remain in the hands of the State to provide affordable energy.

Some examples such as those in Norway indicate that competition is not always the best as demonstrated by the Norwegian case where a competitive market introduced in the electricity market initially reduced prices but subsequently led to an increase in the electricity prices.

In Brazil, it has been found that competition works but this required a concerted effort by Government and private players alike. In electricity generation (Hydro),

SOEs, private companies and IPP's participate in a competitive market. Some of the results showed that competition in transmission market made it the cheapest service provider and that there was 20% load reduction through competition. Given the Brazilian case it shows that competition works, but privatization is not a prerequisite.

Discussions on competition should take in to account new policies such as those that have been put in place, for example the Petroleum Pipeline Act which promotes competition and the fact that NERSA has issued a petroleum Pipeline Construction license to private sector. The liquid fuels industry is a competitive market.

The following arguments were laid against deregulation taking in to account the few developments expected in the deregulated environment:

- intensified competition and sporadic price wars in the major urban areas;
- regional wholesale price differentials reflecting variations in transport costs;
- volume concentration of retail sales through larger outlets;
- diversified use of outlet sites with expanded accessory and grocery stores;
- relocation of outlets from restricted inner city sites to sites with lower land values;
- wholesaler acquisition and franchising of strategic sites, to secure market shares; and
- continued niche markets for smaller suburban and rural outlets.

6.4.3 Key Outcomes

The key outcomes from the session can be summed up as follows.

- In the pursuit of competition, social issues such as alleviation of poverty should not be ignored. When deregulating, it is of outmost importance to take into account the social configuration of a country for instance in South

Africa, it is important to take into consideration the level of economic development and income inequality.

- It should be acknowledged that competition will not solve the issue of prices (i.e. necessarily drive prices lower). Competition is not always an appropriate approach to energy service delivery since it also has the potential to increase prices to unbearable levels.
- Lack of competition is not always due to a lack of regulation but can also be a result of market monopoly. Good regulations can create competitive markets.
- Generation, transmission and distribution should remain in the hands of the State.
- Competition does not help other development agendas and can create monopolies especially in the rural areas.
- Competition is not an end in itself but merely a means to an end.
- Competition is not only about private sector but competition can take place amongst government institutions.

6.5 The Role of the State in the Energy Sector - Should the State Participate in the Energy Sector?

The EWP envisages limited State participation in the energy sector but the question that needed to be addressed was whether in the light of global focus on energy security, this approach is still relevant. The session included discussions on infrastructure development and energy minerals production.

6.5.1 EWP Policy Statement

There is no one official policy statement in the EWP regarding this matter. The closest description of the role of State is the sector is a quotation in the EWP that reads thus:

"The State should establish a clear difference between its primary role as a policy making and regulatory entity of the energy sector, and its secondary role as a facilitator in the supply of energy services."

6.5.2 Summary of Deliberations

One of the views which were presented with regard to the role that State should play in the energy sector was that there was a general agreement around the involvement of the State in a developing country like South Africa, in an effort to eradicate poverty and ensure security of supply. It was noted, however that it is essential to assess the extent of State involvement and one of the areas of involvement is the assistance in the financing of infrastructure development especially where the market could not deliver.

It was pointed out that the country was still plagued by areas which do not have grid electrification and that implied that there was no development in such areas. This requires regional economic integration, infrastructure development and provision of regulatory framework, all of which are the responsibility of the State.

It was also mentioned that State was also key in providing general public good items especially those that are critical to the national socio-economic well being, and these include:

- infrastructure development, especially nationally strategic infrastructure;
- driving policy imperatives such as renewable energy targets, nuclear, nuclear, black economic empowerment within the sector, and so forth;
- facilitating and creating a regulatory framework and ensuring consistent application of regulation; and
- leveraging the private sector as far as possible to ensure that it was not unduly burdened with the high cost of infrastructure replacement and new capacity.

One other factor to be considered is that, on the electricity side, markets do not work in an environment characterised by diminished resources and therefore the role of the State should be to monitor and ensure security of supply.

Investment in infrastructure development is linked to GDP growth and therefore the State must ensure correct infrastructure investment at the correct time.

Further areas of strict guidance by the State include facilitating the creation and adherence to regulations and standards defined for the sector. Private sector is more attuned to be involved in operations of their production facilities and marketing of their products and services.

It was also indicated that local production and increasing the proportion of indigenous raw material is desirable. The State should therefore expand its role beyond policy making and regulation to also provide support for private players in meeting national goals. This can be done through participation in energy research and developing of renewable energy sector, legislating energy efficiency, and stimulate renewable energy industry.

The State also needs to ensure that its state owned entities are strengthened especially the National Oil Company (NOC) with regard to management of the petroleum sector. This would be critical in assisting the NOC to transform from only monetising petroleum reserves into becoming agents of sustainable economic development in their own nations as well as being instruments in an emerging new world order in helping their shareholders meet new strategic imperatives.

The above is critical as the new strategic imperatives of the State demand multilateral coordination and cooperation, new alliances and constructive participation in new multilateral institutions.

6.6 Ensuring Security of Supply

This session focused on a number of security of supply policy positions including reserve margin policy, local production with indigenous or imported material and import and export policies. The role of synfuels in security of supply, promotion of

local uranium industry, strategic stocks policy, promotion of coastal (crude refining) versus inland refining were also issues that needed to be explored.

6.6.1 EWP Policy Statement

"Given increased opportunities for energy trade, particularly within the Southern African region, government will pursue energy security by encouraging a diversity of both supply sources and primary energy carriers."

6.6.2 Position Paper

The Energy White Paper commits the government to ensure the security of supply of oil and petroleum products through the holding of strategic stocks. *"Government will determine the country's strategic oil requirements and will ensure that supply security is maintained"*. Cabinet approved a strategic Stocks Policy for the Republic of South Africa in November 1999. This policy stipulates that South Africa shall hold the equivalent of 90 days of net imports thus aligning the country's position to the International Energy Agency (IEA) member countries that have to keep 90 days of equivalent oil consumption.

While the Policy statement makes reference of 90 days stock holding, the Industry and Government combined have typically held less stock, both in finished products and crude oil. While the Basic Fuel Price (BFP) formula in 2003 made provision for Industry to be carrying the equivalent of 25 days stock of finished products for consumers, the Industry has not been abiding to this practice. No recent investments in tankage have been made by the Industry. A varying level of crude oil has been held by Government at Saldhana Bay as strategic stocks.

DME has conducted a study to review the strategic stocks policy. The study focused on the level of strategic stocks, the form, management, financing and trigger and release mechanisms of such stocks.

At present, South Africa through the National Oil Company is holding 10.3 million barrels of crude only, which is equivalent to 20 days of stocks. This is in contrast to the policy requirement of 90 days of net imports. Oil companies have an

obligation to hold strategic stocks but have not been fulfilling it to the full extent. Furthermore, although oil companies are compensated for holding 25 days of finished product stocks, no regulations are in place to contractually force them to hold the stocks.

The study conducted demonstrated the need to ensure Industry compliance to strategic stock holding levels through regulations.

6.6.3 Summary of Deliberations

The policy environment sets the tone for how the trade-off between security of supply and costs has to be done. Energy consumption is driven by demand and not the other way around. Energy Policy, Foreign Policy as well as Trade and Industrial Policy are traded off in support of economic growth. All these have to be complementary to support economic growth.

Energy policy is about strategically managing the orderly development of the energy economy to ensure that energy is accessible and affordable and that the supply thereof is sustainable in order to support economic growth whilst addressing climate change imperatives.

The following were identified as some of the key challenges with regard to energy management within South Africa

- There was a lack of efficient integrated energy planning.
- There was a lack of local, regional and global contextualisation of the supply challenges in terms of a strategic stocks policy, import-export policies and integrated supply and infrastructure investments.
- There needed to be effective demand side management that could sustain economic growth and poverty reduction.

Key challenges within the liquid fuels as well as electricity supply chain were mainly related to the production and logistics.

Within the liquid fuels supply chain production challenges include access to sustainable supplies of crude oil and refined product; insufficient refining

capacity; and the lack of a workable regulatory framework. Logistics challenges involve the sustainable distribution of refined product to the market.

Within the electricity supply chain, production challenges include ensuring sustainable supplies of affordable fuel; provision of sufficient surplus generation capacity and reserve margin as well as a workable regulatory framework. Logistics challenges include provision of an efficient transmission grid as well as an efficient local distribution grid.

In a sense security of supply could be summed up as an infrastructural issue.

Other views highlighted that there was a need for:

- diversification of fuel requirements for electricity generation;
- standards for electricity security of supply;
- adequate delivery mechanisms in the transmission and distribution of electricity;

It was also pointed out that there should be systematic interactions between various energy carriers and energy planning issues should take into consideration the availability of skills, demand profiling and forecasting as well as the issue of reserve margin.

Another view which was raised was that the import bill and its impact on balance of payments encourages dependency on own resources. Some form of dependency is built in the inflexibility of refinery feedstock diet (e.g. refineries designed according to imported grades of crude). There was also a strong view that the global environment had raised the need for self-sufficiency.

Consumers of energy have minimum requirements for security of supply. Major consumers of electricity stated the following as important to their energy;

- Competitive pricing, which would enable them to compete in international Markets
- Excellent quality of supply, which would take cognisance of safety considerations as well as the cost of unserved energy

Other views which were expressed are summarised below.

It was also pointed out that investments in the sector had been historically hampered and therefore risking security of supply. Ensuring security of supply in South Africa is expensive due to high capital considerations such as coal, nuclear and also historically low prices to attract private investment.

Reserve margin is an important factor which requires a balance between costs and reliability. NERSA's NIRP3 proposed a reserve margin of 19% (1 day in ten years) and this should be implemented.

Harmonisation of current plans is also necessary. A combination of NIRP and ISEP is also supported. Human capacity development should be part of this cooperation.

In considering energy security, the idea of the supplier of last resort needs to be considered. Additionally, a possible role for the State and the responsibilities for its various institutions should be clearly defined.

6.7 Energy Import and Export Policy: Global and Regional Cooperation in Energy Supply and Demand

The objective was to address Eskom's reserve margin. Discussions were invited to assess if this is it good enough and whether the intervention from the Government was required. Further considerations were to be given to a possible special dispensation for SADC countries and if South Africa should treat them the same as the rest of the world.

6.7.1 Energy White Paper Policy Statement

There is no clear policy statement on this matter but the following is the closest.

"Given increased opportunities for energy trade, particularly within the Southern African region, government will pursue energy security by encouraging a diversity of both supply sources and primary energy carriers."

6.7.2 Summary of Deliberations

Discussions indicated that the White Paper on Energy Policy was not specific on what should be done regarding electricity imports and exports. However it was pointed out that Eskom had a self-imposed export limit of 15% or 6000 MW. It is suggested that electricity imports be based on an operating limit whose value is dependent on the country's reserve margin. If South Africa were to import, the source should be a risk adjusted supply from one of the three corridors[1]. In doing this, the risk of each country of origin must be totally evaluated and the final choice of the import source be based on this risk profile. Some of the factors that contribute to the risk profile should include the primary energy source, cost of productions and prevailing contracts in those nations for access to the primary energy source.

Given the abundance of resources in the SADC region and the recognition of the inextricably linkage of RSA and the region, (CBM reserves in RSA, Botswana and Zimbabwe; Angola's 6 million bpd equivalent coal reserves) the aim towards self-sufficiency in the region could be considered. The level of adequate imports and self sufficiency must be agreed as a policy. This should take into consideration the huge regional potential and also a clear focus on network security and stability of an interconnected region.

Standardisation of operations, maintenance and operating procedures must be enforced, taking carbon footprint into account. As far as possible, existing institutions such as the African Petroleum Producers' Association (APPA) and the South African Development Community (SADC) must be used to carry all these forward. APPA tends to promote inter-trade among countries and harmonisation of policies that promote regional integration of economies.

Cooperation can not be limited to energy resources, but should be extended to include expertise such as world class operating standards for refineries as well as maintenance programmes. Cooperation in general has however been

[1] The three corridors are namely Eastern, Central and Western Africa , depending on the linkages between the DRC and SADEC

impacted by self-interests among countries which have to be managed in order that this cooperation be successful.

In choosing the import country and to ensure diversity of imports, matters such as performance history of the exporting utility and transmission distance are some of the factors that would need to be taken into account. The avoided cost of supply should also be a key driver in making the decisions.

Cooperation on the crude oil front is also key as countries like Angola produce 2mbbl/d versus 6 billion reserves. Hydrocarbon import and exports should encourage participation of HDSAs and especially focus on access to infrastructure by those entities. Harmonisation, especially with regard to specifications, is therefore important as these should determine where South Africa should import from as well as where we should export to.

The Energy Security Masterplan prescribes usage of 30% of indigenous raw material. The view is that this is too low if Coal Bed Methane, Coal and Mozambican gas are taken into account. The debate is steered at choosing investments in expanding crude oil refineries and investing in SA's competitive CTL technology. Coal reserves applied in CTL will render the country in the same league as the major oil producing countries.

In addition to security of supply, usage of indigenous material is important and whenever possible, imports should be reduced to address the balance of payments. In pursuing exploitation of local resources such as coal however, the environmental outfall such as climate change should be adequately and appropriately addressed.

6.8 Uranium Mining and Beneficiation: A contribution to Energy Security. The Coal Energy Industry Remaining Deregulated – How do we treat Other Minerals?

This session was about security of supply of feedstock for energy carrier production on a sustainable basis, at affordable prices.

6.8.1 EWP Policy Statements

"The coal energy industry will remain deregulated and its level of performance will be monitored."

"The Department of Minerals and Energy will investigate the implications of separating the governance of nuclear energy issues from that of other issues associated with the use of nuclear materials."

6.8.2 Summary of Deliberations

Some of the main points presented against regulation of the coal industry were that control of exports on coal will work against the current industry boom and therefore attainment of high earnings, good employment and a sustained mining industry, all of which will remain in place as long as exports are required and suitable reserves are available. This also means that the prices fetched are international and therefore market forces dictate the future.

It was however indicated that some regulation can only be considered and directed to protection of specific products which may be essential for local industries. It was argued that this mild form of regulation can also apply to training and skills development in the form of a levy the energy and hydrocarbon industries.

It is accepted that coal can contribute to a national energy mix but a policy on this can be considered once viability of alternative sources have been proven.

The management and regulation of uranium was also discussed. At the core of the issue is that nuclear policy recognizes that nuclear energy is the only economically viable alternative to coal for base-load generation and therefore full beneficiation of South African uranium (9% of world reserves) will ensure security of energy supply.

Other key interventions of the nuclear policy are beneficiation through uranium conversion, enrichment and nuclear fuel fabrication. An important policy principle is also the use of uranium in a sustainable manner which implies reprocessing of used fuel / 95% recycled / MOX fuel.

Some of the suggested ways of implementing the above is through the following:

- Mining and milling: Government must ensure security of supply for national needs
- Conversion: An enabling environment and full capabilities must be developed.
- Enrichment: The intent is to develop national capacity
- Fuel fabrication: The government must lead the design of a strategy to develop nuclear fuel fabrication capabilities.
- Reprocessing: A feasibility study must be carried out to evaluate the creation of a processing facility.

Two main challenges to achieving the above have been identified as technology and capacity. With regard to technology, it was indicated that South Africa did not yet have state of art and economically viable nuclear technology. One option in which this could be addressed was through research and development. This is however time consuming and will require significant funding. Alternatively, this can be acquired through joint work with an international partner.

The issue of capacity was highlighted as an urgent necessity for South Africa. It was mentioned that South Africa would have to institute a special capacity building programme or alternatively an international partnership that can bring capacity into the country. A special promotion on national focus as well as coordination will be key to implementation.

7. Electricity

7.1 Promotion of Access to Basic Energy Services to Poor Households

The discussions of this session were focused on the Integrated National Electrification Programme, universal access, Free Basic Energy (FBE), LPG prices and liquid fuels prices, amongst other factors. The proposed household

energy policy and strategy, safety and standards as well as issues on off-grid solutions, thermal solutions and the role of gas were also discussed.

7.1.1 EWP Policy Statements

The White Paper outlines the need for the provision of basic energy while dividing the energy sector into economic and social areas. In terms of the White Paper, the energy sector can therefore contribute to economic growth and creation of employment. However, the provisions of basic energy services to households remain critical. The Energy White Paper was supported by the development of policies related to the provision of Free Basic Energy to indigent households and the development of strategies to ensure universal access to basic energy.

"Government will promote access to affordable energy services for disadvantaged households, small businesses, small farms and community services"

Government will determine a minimum standard for basic household energy services, against which progress can be monitored over time"

Government commits itself to the promotion of energy efficiency awareness in households"

"New household electrification connections made under the national electrification programme will receive a standard subsidy and there will be no discrimination in subsidy level on the basis of geographic region, supply technology or any other factor"

To a large extend, the objectives of the Energy White Paper were addressed through various policies such as the Free Basic Electricity Policy, Free basic Alternative Energy Policy, Universal Access Plan and the removal of VAT on paraffin. However, not all households benefited in line with the policy position as outlined. It became apparent that there was a need to strengthen and enforce the current policy to ensure effective implementation of the White Paper.

7.1.2 Summary of Deliberations

A number of presentations were made outlining the challenges associated with the provision of basic electricity to indigent households. The initiatives which had been implemented to ensure access to basic energy by indigent households in general were acknowledged.

The DME presented a paper on Energy Access through IeC (Integrated Energy Centre) programme. IeCs are defined as one-stop centres for rendering energy services to rural communities, where the community owns the IeC and is responsible for its operation. At the time, the DME had successfully established six IeCs in various parts of the country. To ensure their sustainability and delivery on their mandates, the DME started auditing of these centres since 2004. In turn, this also encouraged community participation and buy-in, and allowed for the offering of many services as possible in addition to primary energy services. However, due to capacity constraints, the roll-out of IeCs to other rural communities had been slow.

Another presentation outlined that the energy sector policy has shifted from security of supply to access. There was a strong correlation between energy consumption and GDP growth rates and South Africa was at a point where growth in demand outstripping supply and this is mainly driven by high industrial and population growth. As a result, South Africa was experiencing constraints in meeting peak demand and shortfalls of energy supply were expected.

Some other points which were made were that:

- Investments were needed for generation, transmission and distribution.
- There was a need for affordable and sustainable energy in rural areas; however this would lead to an increase in tariffs for those in rural areas due to their geographical location and lack of adequate infrastructure.
- Affordable energy services can contribute towards poverty alleviation and as such support for delivery of access to basic energy services was required.

- The funding of infrastructure will fill the gaps in the delivery of basic energy coursed by market failure. There must be significant investment in energy infrastructure to meet the increasing demand for energy.

Another presentation highlighted that Government could enter into cooperative agreements with non-government community-based entities to achieve objectives of addressing electrification issues in rural areas. Government should create an enabling environment for these cooperatives to establish themselves, but should not take a direct role in their operations. This model had been adopted in other countries, such as the United States of America. Not all its aspects will apply to South Africa, but certain elements of it could certainly be applied. A consideration could be having a cooperative system which is driven by the private sector however the key challenge would be that private companies are normally for profit and therefore it would be difficult for them to operate a non-profit entity.

Other views which were raised were that:

- Even if people get access to infrastructure, affordability is still an issue. More over universal access needs to be expanded to all rural and out of reach areas
- The issue relating to the transfer of ownership with the establishment of REDS needed to be addressed. This was impacting on the ability for some of the municipalities to commit funds for electrification programmes.
- The definition of "poor" needed to be clarified because it appeared that all Government interventions were resulting in the rich extracting more benefits than originally intended for them whilst the opposite is true for poor people.
- A full assessment of all beneficiaries of the electrification programme must be undertaken.

7.1.3 Key Outcomes

The session indicated the need for investment in energy infrastructure for effective access to basic energy especially in rural areas. Government should

enable an environment that allows for the establishment of non-profitable organisation focusing on investment in energy infrastructure. The establishment of IeCs was viewed as an achievement in the provision of basic energy to rural communities. However, there is a need to provide access to basic energy to various rural parts of the country. It was recommended that the department's approach should be to establish IeCs in every:

- Poverty node by 2008,
- District municipality by 2010, and
- Municipality by the end of 2015.

It is apparent that investment in rural infrastructure will be very costly hence government needs to work closely with non-profitable organisations in delivering these services. It was further emphasised that generation of electricity must also be given high priority given the high demand for electricity.

Government should provide an enabling environment for the establishment of other energy centres. The American model of establishing co-ops (NRECA) needs to be investigated in South Africa with a possibility of allowing private sector to participate or partnering with other interested parties. However, it was acknowledged that the private sector is interested in making profit and might not be interested in non-profitable organisations.

It is important to have a clear definition of indigent households. The government introduced Free Basic Electricity but most indigent households are not benefiting from the programme while non indigent households are benefiting.

7.2 EDI Restructuring for Security of Supply

Discussions in this session were guided by the published Cabinet decisions on the topic but with the key focus being on security of electricity supply. This included ensuring reliability of supply in the EDI, its role in economic growth and contribution to sustainable development.

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7.2.1 EWP Policy Statement

"The electricity distribution industry will be consolidated into the maximum number of financially viable independent regional distributors"

"The distributors will be owned by municipalities and ESKOM. Control of all distribution network assets must pass to the companies and the Transformation Team will determine appropriate mechanisms for achieving this"

The Energy White Paper of 1998 and the EDI Restructuring Blueprint of 2001 comprehended that the distribution industry faced a number of challenges in its attempt to provide low cost, equitably priced and quality supply to consumers. The government committed to establishing a transitional process that would lead up to the establishment of independent electricity distributors. To this end EDI Holdings was established to manage the process of restructuring and facilitate the transition from the fragmented industry structure of 188 separate electricity distributors to a new model of six regional distributors (REDs) as per Cabinet decision of 25th October 2006. It was also specified that these entities would be regulated by NERSA.

7.2.2 Summary of Deliberations

In her keynote address to the Energy Summit, the Minister of Minerals and Energy Ms. Buyelwa Sonjica made reference to the audit report which was released by the National Energy Regulator of South Africa (NERSA). The report was based on a study which was conducted on eleven electricity distribution utilities in the country and showed that the operations of the electricity distribution industry were sub-optimal with an infrastructure maintenance backlog of approximately R7 billion at the time. This scenario posed a serious challenge for the restructuring of the electricity industry in the country and called for the acceleration of the EDI restructuring process.

The objectives of the restructuring include ensuring that mechanisms would be in place to ensure an equitable application of tariffs for each consumer segment. The restructuring would further enable the provision of quality supply and service,

in support of economic & social development. It would allow Government to meet its electrification targets in the most cost-effective manner while meeting the legitimate interests of all stakeholders in the industry. It would also enable the electricity distribution industry to operate in a financially sound & efficient manner, for consumers & employees.

The consolidation of the industry would provide economies of scale, financial viability as well as rationalised and competitive tariffs. Some benefits which were anticipated to be achieved through this process included increasing access to electricity, improvements in service and reliability thereof which would in turn contribute to local economic growth.

The following outlines some of the key views which were formally presented during the session.

The DME provided an overview of the recommendations of the Energy White Paper on Energy Policy with respect to the facilitation of national growth and the blueprint for EDI restructuring. Some of the challenges and the Cabinet decision of 25 October 2006 were touched upon. The view was that the distribution industry only looked at their own isolated areas without taking the national issues into consideration.

National Treasury outlined the objectives of the restructuring and the role of the municipalities. This indicated that the constitution gives local government the function of electricity reticulation. It was indicated that for restructuring process to be successful, the key drivers required would be a supporting legislative framework and a clear roadmap with commitments and support.

Further views highlighted some of the key issues and opportunities that would form part and parcel of the restructuring process. Advantages and disadvantages of the different types of restructuring models (single versus multi buyer models) were shown. These indicated that each model depended on the size of the market.

Another view was that some of the reasons that the REDs had realised included that there was inadequate support from the relevant stakeholders and role players; the process had not been managed effectively; and there were problems associated with control and ownership of assets which in turn led to problems with regards to the transfer of assets upon the establishment of the REDS. It was also raised that, as an alternative plan, only those municipalities which did not perform well should be incorporated into the REDs with those that performed well being left to operate on their own (i.e. "Plan B").

Another challenge experienced by EDI, was the implementation of the Cabinet decision to establish six REDs. It was also highlighted that the primary reason behind the failure of the establishment of the first RED (RED 1) was that there was no relevant legislation to support the processes establishment. The reason behind the non-success of this RED was that parties did not fulfilling their obligations for the transfer of assets. It was also indicated that there was a master plan for establishment of REDs which could be achieved if issues were resolved and the end state was clarified.

Other comments from stakeholders are outlined below.

- There is a lack of understanding by the role players as to how these REDs would operate.
- Other challenges include a general lack of experience and benchmarking. The recommendation was made that training needs should be identified and where relevant provided.
- Another view indicated that the question about possible loss of income by the distributors of electricity if they become integrated into the REDs remained unanswered. They also posed a question seeking for clarity on what the DME was doing with regard to stakeholder interests and timeframes regarding the process.
- There was disagreement about whether or not municipalities which performed well should be incorporated in the REDs (i.e. "Plan B"). A view

which opposed this recommendation indicated that the decision rests on local government having the authority and therefore was not an option. They also indicated that the model for the establishment of six REDs could work as shown by the modeling exercise which had been done. It was further indicated that this exercise showed that all REDS, with the exception of one required financial assistance which could be provided by the National Treasury, hence making this model viable.

Following the presentations, discussions and inputs which were made during this session, the conclusion that can be reached is that the following are some of the issues that should be addressed.

Legislation to clarify ownership and align the structure of the industry to the new RED scenario is required. This would entail introduction of the RED Establishment Bill as well as development of an asset transfer framework amongst others.

The role of municipalities post the establishment of REDs as well as the issues of loss of revenue from electricity sales would need to be addressed. This would require agreements to be put in place regarding revenue flows based on performance as well as compensation of assets to be transferred.

Investment would need to be made for infrastructure development as well the maintenance thereof. In this regard, a strategy would need to be developed which would enable the distribution industry to minimise the maintenance backlog and bring infrastructure to an acceptable level of operation.

Support would be required from all the role players. There would need to be a concerted effort on the development and retention of skills. This would require an effective communication strategy to all stakeholders. A skills retention strategy would need to be put in place so that skills are not lost to other industries due to uncertainty and delays in the restructuring process.

7.2.3 Key Outcomes

Implementation of the Cabinet decision to establish the REDS was highlighted as one of the biggest challenges. A major contributor is the lack of legal support for the process. This was highlighted with respect to the constitutional rights of local government which is legally obligated to reticulate electricity. This has led to the lack of legal support for the process for the establishment of the REDS. This in turn led to poor definition of roles for all stakeholders and therefore poor cooperation. Visible progress can only be realised by addressing the above.

7.3 Investment in new Electricity Generation – The Role of Independent Power Producers (IPPs) and Market Structure

This session deliberated on the role of IPPs (including renewable IPPs). Appropriate market structures to deliver on a South African Industrial strategy and ASGISA ambitions were also some of the issues that this session intended to address.

7.3.1 EWP Policy Statement

"Government will encourage competition within the energy markets"

"Where market failures are identified Government will intervene through transparent, regulatory and other carefully defined and time delineated mechanisms, to ensure effective delivery of energy services to consumers"

7.3.2 Summary of Deliberations

In 2003, Cabinet approved private-sector participation in the electricity industry and decided that future power generation capacity would be divided between Eskom (70%) and independent power producers, or IPPs (30%). The DME was mandated with the responsibility of ensuring private-sector participation in power generation through a competitive bidding process that would diversify primary energy sources and be developed within the electricity sector without hindrance.

A power generation investment plan was drawn up to take into account this 30% private-sector participation in power generation. The planning and development

of transmission systems was to be undertaken by the transmission company, subject to the government's policy guidelines.

During 2003, Eskom implemented a revised business model to prepare for capacity requirements and the impending restructuring by splitting its business into regulated and non-regulated divisions. Eskom's core business, its strategic support businesses, and target markets were reviewed.

- The generation division was to continue to be part of Eskom. In 2003, the power stations in the division were paired together to form clusters to prepare the generation sector for flexibility to accommodate different options in a changing electricity supply industry (ESI).
- The Transmission division was to take responsibility for the electricity grid. Worldwide transmission is regarded as a natural monopoly hence it was proposed that in South Africa, an efficient regulatory body be established that would grant all players access to the grid. For example, in an appropriately structured market, customers could buy energy from sources other than Eskom, such as the Southern African Development Community (SADC) electricity pool or IPPs, but still use the same transmission infrastructure to have power delivered to them.

The key objectives that were sought to be achieved with the introduction of IPPs included stimulating economic development and securing supply through diversity. In order to achieve this, an electricity market structure would need to be established. The key components of the study included,

- Electricity market structure
- Methodology for Introduction of IPPs
- Mechanisms for ensuring equity

Some of the planned benefits included increased opportunities to exploit cheaper generation options; the potential to increase the level of supply security; the potential for efficiency improvement as well as the downward pressure of electricity prices.

Government's position was that the security of supply was a national priority which took precedence over all other key elements, including a competitive market. Therefore Cabinet resolved in 2007 that Eskom be designated as the single buyer of power from Independent Power Producers (IPPs) in South Africa. Eskom would be responsible for ensuring that adequate generation capacity would be made available and that 30% of the new power generation capacity would be derived from IPPs. This policy would ensure that the responsibility and accountability for the construction of power generation capacity would be coordinated and provide certainty to the potential independent power producers.

Some of the views expressed regarding the introduction of IPP's indicated that based on recent experience of establishing an IPP that government and the players clarify exactly what the market structure under this model should look like. It was mentioned that the single buyer model, in particular the fact that Eskom would play this role, introduced uncertainty since the rules and protection pertaining to the IPP's were not clear. The view expressed was that the lack of certainty with regards to policy resulted in the reluctance of IPPs to invest.
The session was also a platform for shared best practices which were gained through the adoption of co-operative models used in rural areas in the USA. The potential of leveraging smaller generation opportunities specifically in the remote areas, were shown to offer some real value.

Some support was shown to the concept of IPP's. but there was a general misgiving regarding the single buyer model as stated in the recent Cabinet Decision. It was stressed that it is essential to take into account the support required by poor households. Furthermore, it was stated that there was still a 27% electrification backlog that needed to be addressed and therefore IPP's were seen as playing a positive role in this regard.

Other inputs which were obtained from various comments from the floor are outlined below.

In order to create an enabling environment, it is essential that the market structure be addressed and the rules for providing the desired signal to potential investors as well as the customers at large be defined. The outstanding policy gaps regulating the IPP business need to be finalised in order to create certainty to attract the required investment. Furthermore, clarity was required on what informed the figure of 30% of power to be produced by IPPs. The State should prepare an enabling environment so that there is a balance between demand and supply.

The social impact of the introduction of IPPs was another facet of the topic that came through the discussions. Concerns were raised that representatives of the social structures were not present at the Energy Summit to state their case. Clarity was also sought on whether the introduction of IPPs would have an impact on electricity tariffs. It was also pointed out that all government initiatives, including IPPs, should have national, class and gender considerations. The impact of the OCGT operations on diesel requirements was also raised. The price impact of the importation of diesel, specification and transportation given the high cost to electricity had to be factored in to the affordability of electricity..

7.3.3 Key Outcomes

Following the presentations, discussions and inputs it can be concluded that the following, are some of the issues that should be addressed.

- The single buyer model must be investigated
- The regulation of the current buyer model by NERSA
- A separate white paper on electricity generation should be developed
- The DME should create an enabling policy environment which will encourage IPP's to invest in South Africa and to ensure that the establishment of an effective market be addressed to provide certainty and a more predictable energy perspective

7.4 Cost Reflective Tariff Setting

The purpose of this session was mainly to address the contentious issues pertaining to tariff setting and the approaches connected therewith. Tariff discussions by and large in South Africa are intertwined with municipal surcharges especially in the electricity sector, where municipalities have executive authority over reticulation. The Energy White Paper of 1998 laid principles with regard to the treatment of tariff and therefore the summit needed to examine successes, failures of those principles and as well to offer proposals on how areas that lacked progress could be improved.

7.4.1 Key Policy Position

The Energy White Paper espoused the following principles with respect to tariffs:

- A move towards cost reflective energy prices, including externalities.
- Transparency of subsidies
- Retention of the option of energy taxation
- Usage of prices signals to support optimal investment within the energy sector

7.4.2 Assessment of Policy

The principles of the EWP were thoroughly unpacked for the development of the Electricity Pricing Policy (EPP) which sought to provide an elegant manner of applying the principle within an environment of strong contestation with regard to outcomes upon applying the principles. The EPP is not yet mature enough to enable to measure its effectiveness, however it could said that most of the stakeholders support the principles contained therein and hope to see its full implantation soon. The policy acknowledges the challenges that relate to tariff setting as further effort would be required to make cost reflective within our context.

7.4.3 Summary of Deliberations

A number of presenters highlighted frustration with the lack visible implementation of the proposal contained in the EWP with many suggesting that the failure to restructure distribution is exacerbating the unequal treatment of consumers. Lack of skills in the municipal environment with respect to the subject of tariff design featured prominently. The importance of having a clear policy and regulation framework was highlighted as being critical in ensuring the required uniformity with the energy sector. This lack of this is evident in the electricity sector which has over 1000 tariffs that are mostly not aligned with costs and causation. The idea of surcharges and cross subsidies were welcome but the presenters highlighted that this must happen within a ring fenced environment in order to achieve sustainability.

What became clear from the Summit regarding the subject is that tariff design is by no means a science and emphasis was placed on understanding broader economic impacts. Cost reflective tariffs were seen to send the right economic signals. The following items must be treated adequately in order to ensure successful application of this approach.

- Avoid unnecessary cross subsidies;
- Reduce heavy reliance on taxes;
- Use direct subsidies without reducing tariff/prices;
- Use revenue required and follow regulatory principles and
- Carry demand studies that links prices and quantities from time to time.

7.4.4 Key Outcomes

The session concluded by stressing the following elements which are viewed as pillars of cost reflective tariff setting:

- Accept the complexities and uncertainties within the tariff setting arena
- Strengthen the Regulator and regulatory framework

- All tariff should be set based on revenue requirement to provide an efficient service,
- Allocate common costs fairly
- Use demand studies to determine billing determinants.
- Treasury to regulate surcharges.

7.5 Coordination of Electrification Programme and the Role of Non-Grid Solutions in the Quest for Universal Access

This topic was about understanding the role played by different energy carriers, including that of non-grid solutions, is important in energy recurity. Non-grid solutions should never just be seen as interim measures. Community experiences will be shared in a bid to formulate longer lasting approaches.

7.5.1 EWP Policy Statements

"Government commits itself to implementing reasonable legislative and other me asures, within its available resources, to progressively realise Universal Access Household to electricity".

"Government will establish a National Electrification Fund to provide electrification subsidies."

"Government will subsidise a portion of the capital costs of connections made towards meeting electrification targets"

"The impact of national electrification programme will be evaluated and the electrification policy amended from time to time"

7.5.2 Summary of Deliberations

The DME is mandated to establish a universal access to electricity through appropriate planning, funding and managing the implementation process. This I will be achieved through cooperation and the implementation of the ISRDP, URP, EPWP and IDP.

At the time of the Summit, there was a backlog of 3 416 533 households in the Eastern Cape, Kwa-Zulu Natal and Gauteng have higher backlogs due to a general existence of informal households. These were as a consequence of topographic problems and high cost per connection.

Key challenges were found to be mainly infrastructural and implementation constrained by poor availability of skills at municipalities who are normally licensed to distribute electricity but lack the capacity to deliver the electrification programme.

It was highlighted that appropriately targeted funding will help alleviate the key problems of capacity and backlog.

It also emerged that some of the independent contractors assigned to the programme are not properly registered and hence compromising quality and legality of project delivery.

Completed connections do not readily imply electricity supply to the needy. This dislocation is mainly due to capacity constraints in the transmission system and breakdown of aging network. This ought to be corrected if universal access has to be achieved.

The electrification programme, known in the industry as the Integrated National Electricification Programme (INEP) also contributes substantially towards job creation. At the time of writing, this stood at 5000 jobs per annum

Some municipalities believe that INEP should be executed within the context of competing with other socio-economic programmes such as sanitation, water and health. Prioritisation is therefore key in the overall service provision by the municipalities especially with regard to funding requirements. This requires coordination with other stakeholders like departments of Housing, Education, and Water Affairs.

Some further constraints to delivery encountered by the municipalities include:

- Sparse density of settlements

- High costs of operations and maintenance
- Illegal connections and
- Theft of infrastructure

7.5.3 Key Outcomes

Improvements in the following areas can assist expedite the electrification programme.

- Acceptance of off-grid solutions
- Improvement of institutional arrangements especially between Eskom, NERSA, DME and municipalities and clear definition of roles and responsibilities.
- Proper funding allocations
- Employment of tools such as electrification modelling, planning.

8. Renewable Energy and Energy Efficiency

8.1 Energy Efficiency and Demand Side Management (DSM) to enhance Energy Security

The purpose of the session was to deliberate on Energy Efficiency and Demand Side Management (EEDSM) and their role in enhancing energy security. The energy security framework recognises the need for optimal use of energy carriers both as a climate change mitigation tool as well as a tool to ensure continued and sustainable supply of affordable energy. The framework also recognises the appropriate choice of energy carriers for applications and a greater understanding of different sectoral demand patterns are fundamental in achieving our set targets. Some of the issues addressed included how EEDSM can enhance energy security, required measures, funding, regulatory adjustments and , technology opportunities to be explored or focused upon.

8.1.1 EWP Policy Statement

"Government will facilitate the establishment of energy efficiency norms and standards for commercial buildings".

"Government will facilitate the performance of audits, demonstrations, information dissemination, sectoral analyses and training programmes".

"Government will facilitate the establishment of energy efficiency standards for industrial equipments".

"Government will consider the implementation of an energy efficiency programme to reduce consumption in its installations"

8.1.2 Summary of Deliberations

The opening of the session highlighted that there was a need for South Africa to adopt a holistic approach to energy management and in particular to educate customers with reference to the effective use of the various energy sources.

The following outlines inputs and comments were raised by various stakeholders.

There was a strong view that South Africa, for too long, had relied heavily on grid energy and hence the perception had been created that the most appropriate energy solution was electricity.

With regard to energy policy and strategy, it was pointed out that it is essential that in policy setting, lessons which have been learnt both locally as well as elsewhere in the world be taken into account to ensure appropriate policies for the South African conditions without reinventing the wheel.

With regard to the regulatory environment, there was a view that the energy market required appropriate regulations and the setting of standards which would promote the effective use of the various energy sources. Furthermore, the regulatory regime must facilitate the monitoring, compliance, reporting and measuring of the progress in terms of the implementation of energy efficient initiatives. The need for the setting of technical standards and specifications, as well as a mechanism to implement and control these standards, which should be

applicable to manufacturers of any equipment and goods for the energy market, was also raised.

With respect to focusing on the customer, it was highlighted that there was a clear need for customer education in terms of the selection of the appropriate energy source. It was therefore essential that the energy policies do not discriminate against customers and they take into account particularly the poorest of the poor.

A point was mentioned that unless the efficient use of energy in the broader sense was appropriately promoted, traditional energy usage patterns would continue. It was also pointed out that the efficient use of energy could contribute directly to the improvement of health, resource utilisation, job creation, climate change as well as environmental management.

It was also mentioned that it would be important for Energy Services Companies (ESCO's) to be appropriately established and that adequate funding should be made available and individuals trained to provide effective customer education and support.

Key points which were raised with regard to affordability included that the price of electricity would be under pressure in the future, primarily due to the capital and investment requirements in the short to medium term. Furthermore, the lack of investment in the current assets serving electricity customers, will further contribute to capital requirements to normalise the conditions of these assets.

The view was that if these aspects were not effectively managed, the affordability of electricity as an energy source could come under risk. This further proved the point why it was essential that energy should be promoted in the holistic sense and it might call for the promotion of access to energy rather than access to grid electricity.

One view which was raised with regard to the utilisation of energy was that it is essential that pricing signals be effectively used to influence customer behaviour and holistic energy efficient utilisation. It was pointed out that while Demand

Side Management (DSM) was recognised as an effective option for managing energy utilisation, it was essential that the emphasis should shift towards energy efficiency and the selection of the appropriate energy source for the relevant application.

The transport sector and in particular the public transport sector, was identified as having significant opportunities from an effective energy efficiency management perspective. It was therefore essential that this sector receive specific focus and attention to leverage the energy efficiency potential in the national interest

Another point of view acknowledged that the energy sector played a pivotal role in the economy as well as the upliftment of people. Therefore it was essential that the regulatory regime encourage effective asset management and ensure that current asset owners comply. The energy industry must be restructuring in such a way that it provides open access to all potential customers and that it ensures a sustainable, efficient and reliable industry for all SA.

The effective management of an energy efficiency programme should directly contribute to capital savings with respect to infrastructure upgrading.

Policy and strategy should promote the broader national goals and to this end it is important that empowerment of previously disadvantaged groups must receive priority while the empowerment of women should remain high on the agenda.

Some recommendations were made and these included the following:

- that existing energy policies be reviewed against the current scenarios and inputs from the Energy Summit be utilised where appropriate;
- that the establishment of the energy market and the associated rules be addressed;
- that a consolidated and integrated energy efficiency strategy be developed;
- there should be an increased focus on a holistic approach to energy efficient utilisation and that customers should be educated accordingly; and

- Effective asset and infrastructure management must remain a top priority.

8.1.3 Key Outcomes

From the deliberations during the session, it emerged that there was a clear need for an appropriate policy framework and strategy to address, amongst others:

- Energy Efficiency;
- Demand Side Management (DSM);
- Energy Security and Reliability;
- Mitigating against dumping of inefficient equipment;
- Energy market and associated rules;
- Energy efficiency programmes to complement load management programmes;
- Protection of the poor;
- Contribution by developers towards energy efficiency;
- Contribution by manufacturers and suppliers towards energy efficiency;
- Accreditation of ESCO's; and
- Roll-out of customer education.

8.2 Renewable Energy Framework for South Africa

The role that has to be played by renewable energies in energy security needed to be fully explored, identifying the areas that South Africa should focus on as well as the costs and benefits associated with different approaches. The session aimed to reflect on the status of the renewable energy policy framework, challenges faced, policy perspective and initiatives that are on the pipeline to address identified challenges in South Africa.

8.2.1 EWP Policy Statement

"Government will provide focused support for the development, demonstration and applications of renewable energy sources for both small and large scale applications".

"Government will support renewable energy technologies for application in specific markets on the basis of researched priorities".

8.2.2 Summary of Deliberations

A presentation was made on implementation progress on the White Paper on Renewable Energy Policy. The presentation indicated the Department establishment of the Renewable Energy Finance and Subsidy Office (REFSO) which was operational and responsible for providing capital subsidies for renewable energy projects. In progress is also an investigation into the introduction of Tradable Renewable Energy Certificates (TRECs) as well as a long term financing mechanism such as a feed-in tariff. Parallel to this, the Department also indicated that they were in the process of implementing REMT and SAWEP support programmes which were funded by international donors. The key challenges identified were cost competitiveness, legal framework, environmental and planning approvals, governance and implementation capacity.

Further input indicates that South Africa was not cost competitive when compared to conventional energy carriers. Consequently,, cost is a major barrier in the implementation of renewable energy. The presentation also highlighted that energy efficiency and conservation were priorities that needed to be considered and that lessons learnt so far in the implementation of Renewable Energy policies are, excessive regulatory red tape, economic hurdles, low levels of third party funding and market deployment challenges.

Some stakeholders are also in the process of developing a renewable energy strategy as part of their drive to increase focus on renewable energy. The strategy seeks to ensure that all renewable energy sources would be considered and sought to find multi Mega Watts options for grid supply.

The role of Research and Development, with diversification of supply being the key driver in order to achieve energy security was highlighted. Other drivers were specified as climate change, environmental concerns and resource constraints. also It was indicated the country would eventually have 1 600 MW of renewable energy power plants by 2025. Financing mechanisms and policy environment are the main key barriers to relaisation of this goal.

The session shared some international experience on renewable energy. Best practices require that an enabling policy framework environment is the key success factor for renewable energy. International renewable energy policy options include feed-in laws, competitive tendering mechanism and renewable energy portfolio standard and that the financial incentives policies such as tax credit, carbon credit, capital subsidies and concessional loans.. All these are essential in successful introduction of renewable energy policies.

Some opportunities in renewable energy were presented. A particular position was that renewable energy finance options such as a long term finance mechanism, TRECs and Clean Development Mechanism (CDM) were an important vehicle to stimulate the growth of the renewable energy sector. Energy efficiency initiatives such as Solar Water Heating (SWH), solar panels, waste recycling are crucial for the climate change mitigation and renewable energy. South Africa has its own challenges which differed from those of other countries such as the European Union (EU) countries and that key constraints for South Africa includes access to national the grid. A real commitment by Government as well as an enabling policy and legal framework are key.

8.2.3 Key Outcomes

The following outlines some of the key outcomes of the discussions which were held.

South Africa had an abundant renewable energy sources across the country that remains untapped thus far. The White Paper on Renewable Energy set a target of 10 000 GWh to be achieved by 2013 from the renewable energy sources and that there was therefore a need to create an enabling environment for the development and uptake of renewable energy technologies.

Major challenges to be dealt with include the relatively high cost of renewable energy as well as the regulatory environment. It is suggested that South Africa establish a long term mechanism such as feed-in law to attract foreign investment and facilitate the development of renewable energy. The long term mechanisms could be supplemented by CDM and trading of green certificates. Appropriate policies should be implemented to enable subsidies and Demand Side Management (DSM) programmes such as SWH.

It was also suggested that other summits such as renewable energy, nuclear, coal should take place as a follow up on the energy summit and that these summits should have intent to review the energy carriers in line with the broader Energy White Paper Policy.

8.3 Climate Change Mitigation Strategies for South Africa

Energy security and sustainable development require that South Africa develops or adopts appropriate climate change mitigation strategies, but the question is which ones are appropriate? The panellists explored different approaches including energy efficiency, Clean Development Mechanism (CDM), monitoring and evaluation and renewable energy promotion. Each proposed approach, potential costs and benefits associated therewith were discussed.

8.3.1 EWP Policy Statement

The White Paper acknowledges that the energy sector has major environmental impacts. There are policy statements reflected in the White paper relating to managing energy related environmental and health impacts.

South Africa has already ratified the United Nations Framework Convention on Climate Change-UNFCCC (1997) and the Kyoto Protocol (2002), which creates

the framework for tapping international funds via the Global Environment Facility and the Clean Development Mechanism (CDM) to reduce greenhouse gas emissions.

The Designated National Authority, a requirement under the UNFCCC for countries to participate in Clean Development Mechanism, has been established in the Department of Minerals and Energy to regulate CDM market within South Africa. DNA was established under section 25(3) of National Environmental Management Act of 1998. In terms of the regulations, the Director General of the Department of Minerals and Energy ("DME") is designated as the DNA in South Africa.

It was pointed out during the Summit that Clean Development Mechanism (CDM) was a creative way of attracting foreign direct investment to South Africa and other developing countries. It was further indicated that CDM was a practical framework for countries to reduce or stabilize gases (greenhouse gases) that cause global warming and climate change. Furthermore it provides an opportunity to South African companies to earn an additional stream of revenue while participating in the fight against climate change.

A number of corporate players, some state-owned entities and municipalities had also taken up CDM investments with the aim of contributing to sustainable development objectives and emissions reduction. The potential sales of certified emission reductions (CERs) will bring additional revenue streams for municipalities. Over and above this, these projects have the potential to help SA reduce GHG such as CO2 which are emitted largely by our energy sector.

8.3.2 Summary of Deliberations

Some background on CDM plus the status quo CDM market in SA were provided. It was pointed out that policies for addressing climate change have environmental, political, economic and social impacts. ISouth Africa was amongst the largest emitters in the world, and the energy sector contributed most of the greenhouse gases emissions. As a result SA was being targeted together with

some of developing countries such as China, India, Brazil and Mexico to set targets for reduction of emissions.

Government will continue to participate in Climate Change negotiations in order to maximize the advantages arising from opportunities such as international funding, technology transfer, and energy efficiency, adaptation and mitigation measures.

Another presentation provided an overview of challenges which the country was facing in relation to global warming and climate change. Some of the issues around the relationship between energy security and climate change were outlined and it was pointed out that South Africa produced two percent of total global emissions. It was further indicated that the Sasol plant at Secunda was often quoted internationally as being amongst the largest source of GHG emissions in the world. Clearly in terms of long-term strategy, the fact that we need to be able to deal with our energy supply problem and also deal with issues of energy security imposes another set of problems in relation to climate change.

It was also indicated that Government was also in the process of updating the greenhouse gas inventory, the results of which were anticipated to be around May 2008. In addition a national long-term mitigation scenario (LTMS) planning process had been commissioned to consider and evaluate options for reduction of total greenhouse gas emissions as a country. All relevant Government Departments, key industrial sector participants, NGO's and researchers were part of the LTMS process.

Another presentation provided some insights on the global carbon markets, financing and issues around carbon pricing. A report which had been recently published on the carbon disclosure project, in which 315 institution investors around the world had been surveyed, indicated that the carbon assets amounted to approximately 40 trillion dollars. This gave an indication that climate change had certainly moved up in the agenda because in 2006, the carbon market was about 30 billion dollars, with the EU trading scheme leading the market.

It was pointed out that given that SA is generally a semi-arid country and its geographic location was sitting in a belt between the westerly system and tropical system which made it vulnerable to climate change. There was evidence of coherent changes in climate systems other than temperature and changes in rain fall had been observed. The intensity of these extreme weather events and the frequency has increases and having serious implication for our rural poor, particularly subsistence farmers, housing and these poor areas.

In dealing with climate change issues some stakeholders have focused on recovery relief, prevention and preparedness, thus highlighting the importance of adaptation. Some expressed views include that government needed to make sure that the long-term mitigation scenario process fed into the review of the Energy White Paper. Climate change is seen as challenge to everyone i.e. civil society and business. A requirement for further clarification and elaboration of specific and appropriate mitigation strategies for South Africa are to be defined.

8.3.3 Key Outcomes

Some of the comments which were raised by various stakeholders are outlined below.

- Renewable energy and nuclear had a huge potential for the reduction GHG emissions
- South Africa had an opportunity to benefit from the hydro-power pool project
- South Africa needed to start looking at ways of displacing coal as a heat source
- More budgets for solar and nuclear research were required
- South Africa must factor environmental connotation in infrastructure development
- The climate change strategy had specifically excluded any mention of an economic instrument

The key outcomes from the energy summit can be summarised as follows.

Renewable energy, nuclear and energy efficiency have a key role in climate change mitigation. Government should make adequate investments in clean fuel to improve public transport.

South Africa needs to take advantage of funding sources such as the Global Environmental Facility, the Clean Development Mechanism (CDM) that have been established for developing countries to assist them in reducing the environmental impacts of developmental projects and to achieve the objective of sustainable development objectives. The contribution of energy efficiency and renewable energy in reducing emissions should be built into the opver all strategy.

9. Nuclear

9.1 Safety Regulations and Safeguards to Implementation

This session focused on safety regulations in the nuclear generation as well as safeguards to implementation. The purpose of the session was to discuss South Africa's state of readiness for nuclear energy expansion. This included an assessment of whether South Africa had the necessary skills available; how aligned nuclear practices in the South African nuclear Sector were with the international best practices, given the Government decisions and support that nuclear energy would play an essential role in the generation capacity. The discussions also included the obligations and commitments associated with a nuclear power programme, both at the national and international level, that is to assess whether South Africa had the nuclear framework which would be robust enough to accommodate the programme. One of the key issues is the need for a comprehensive nuclear legal framework covering all aspects of the peaceful uses of nuclear energy, i.e. safety, safeguards, security and liability, in addition to the commercial aspects related to the use of nuclear material.

9.1.1 Energy White Paper Policy Statements

South Africa's policy position with regard to nuclear was guided by the decision to retain it as one of the policy options for electricity generation. The Energy White Paper encourages a diversity of both supply sources as well as primary energy carriers.

9.1.2 Summary of Deliberations and Key Outcomes

The long-term contribution which nuclear power could make to the country's energy economy was investigated. Optimisation of existing nuclear industrial infrastructure was also taken into consideration. The key issues which were discussed during this session included global nuclear governance, implementation of safeguards as well as nuclear safety regulations in South Africa.

The global framework with regard to nuclear energy as one of the key requirements in developing, expanding and sustaining a nuclear energy infrastructure was discussed. The framework involves a robust national legislation and international obligations, which also form part of the global governance towards nuclear energy. The framework addresses the safety, security as well safeguards. International legal obligations such Non-Proliferation Treaty, International Atomic Energy Agency (IAEA) Safeguards, Additional Protocol, Nuclear Suppliers Group, as well as the Security Council Resolution was also discussed.

The IAEA Safeguards are considered an important tool for monitoring peaceful applications of nuclear energy. Peaceful applications include but are not limited to nuclear power generation. Additional protocol was further discussed as being the universal standard in strengthening the safeguards system and supporting effective nuclear verification. In ensuring that applications of nuclear energy are peaceful, routine inspections are conducted by the IAEA at the declared facilities. It was also reiterated that South Africa had shown its commitment to disarmament, non-proliferation and safeguards and that this served as assurance that the plan to expand nuclear infrastructure would be carried out within the

framework of peaceful applications. It was also highlighted that the national authority for ensuring safeguards implementation in South Africa lied with the Minister of Minerals and Energy.

The existing legislative framework regarding nuclear safety and how it related to international practices were also discussed. It was highlighted that nuclear safety ensures the protection of the workforce, public and environment from nuclear damage/ accidents. The legislative framework involves the National Nuclear Regulator Act, Regulations on safety standards and regulatory practices, Radioactive Waste Management Policy and Strategy, authorisations, requirements documents as well as the guidelines. The current regulation was found to be credible, but regulatory challenges were also acknowledged by the National Nuclear Regulator of South Africa (NNR).

Comments which were raised included that there was a need for the regulatory capabilities of the NNR to be elevated to an appropriate level, and that the NNR needed to be positioned to the national context since the framework for the regulation of the current South African nuclear activities was strongly encouraged by the IAEA conventions.

A key challenge which was pointed out was with regard to the expansion of the industry locally and worldwide, as this imposed a burden to attract and retain scarce technical skills. The strategy which was proposed to address this included provision of training and development initiatives as well as assistance with licensing/technical support from the country of origin of the proposed nuclear installations. The Regulator also indicated that it would look into expanding its documentation on its internal procedures and guidelines in terms of assisting with capacity building and corporate memory retention.

There was no consensus reached on the issues discussed in this session however were various views were raised by the different stakeholders. Some of these are outlined below.

Government's nuclear framework with regard to nuclear safeguards and safety mechanisms by the regulator were inadequate. The view was that the safety

regulator was not independent and the processes of the regulator lacked transparency.

A point was raised that there was a perception that issues of radiation, its effect to human health and waste generated from nuclear power were not viewed seriously. It was also highlighted that these issues were an indication that there was no capacity in South Africa to deal with all nuclear matters and that this posed a serious challenge, more especially towards the generation expansion plans of the industry.

Another view raised was if the regulator has safety requirements already in place for the new builds and the response obtained from the regulator was that they don't t know yet which bidder will Eskom choose in terms of new build.

It was also pointed out that socioeconomics factors, such as costs involved in developing nuclear infrastructure as well as the creation of jobs, needed to be taken into consideration.

Another point was raised that there needed to be a clear link between the development of nuclear energy with overall national goals and objectives.

10. Hydrocarbons

10.1 Use of Regulatory Accounts and Open Access Regulatory System

The session aimed to identify appropriate regulatory principles for governing networked industries (i.e. transmission lines, petroleum pipelines, gas pipelines, etc). It sought to answer questions regarding the applicability of common carrier versus open access principles. It also intended to address the question of whether contract pipelines are appropriate and implications on access in such cases. The session also investigated different regulatory approaches (including tariff setting frameworks) with discussions focusing on their applicability and their advantages and disadvantages.

10.1.1 Summary of Deliberations

Regulatory accounting is a very important tool in calculating tariffs for the different components of the industry value chain. One of the main considerations has been the corporate structures of the different entities being regulated, especially the conglomerates such as Transnet which are involved in diverse segments of industry such as land transportation, commercial aviation, maritime pipelines as well as ports. Additional challenges emanate from the vertically integrated companies like Eskom and oil companies which are not regulated in their entirety but only the parts thereof. Regulatory accounts must take into consideration the regulated and the unregulated parts of the business and these two parts must be separated and handled differently. In other words cross subsidisation should be eliminated.

Even if all the areas of the value chain are regulated, the implication for vertically integrated conglomerates means consistent application of the regulation over entirely different parts of the business. An additional requirement is for similar treatment for the aforementioned types of regulated entities. A consistent and common basis for this tariff application is a requirement as otherwise each time a tariff is set and applied, it will be on a different set of rules and therefore the law will broken if any inconsistency is perceived.

One other point of consideration in introducing regulatory accounts is the issue of regulatory burden on the industry. This goes to the heart of the amount of data management requirements already done by these companies, such as that for corporate and tax accounts.

In the design of the regulatory accounts there is clearly a need to consult all affected stakeholders. NERSA is of the view that it is the responsibility of the regulator to ensure that the design and implementation of these accounts are driven through intensive stakeholder engagement. This is to ensure minimal information gap between the regulator and those entities which it regulates. This is to avoid the current problem in countries such the UK where regulators have been rendered ineffective due to lack of information. The aim is to design

regulatory accounts in such a way that there will be little duplication among information required by the different legal standing of the various companies.

10.1.2 Key Outcomes

Some of the key outcomes from the deliberations include the following.

- Regulatory accounts may not necessarily require new information, but an aggregation of existing information into an additional account.
- Regulatory accounts will provide consistency and transparency in the regulation of entities in the energy sector.
- Regulatory accounts should be used for implementing policy and not necessarily for addressing inconsistency in the utilisation of the energy infrastructure

10.2 Empowerment of Historically Disadvantaged South Africans (HDSAs) in the Liquid Fuels Sector

Discussions for this session included developmental pricing frameworks, job creation and supplier development.

10.2.1 Key position relating to the topic

"The sustainable presence, ownership or control by historically disadvantaged South Africans of approximately a quarter of all facets of the liquid fuels industry or plans to achieve this."

10.2.2 Summary of Deliberations

The Liquid Fuels Charter was signed by the industry to provide a backbone of transformation and commitment to BEE as a growth and development initiative. This is an important economic development as the exclusion of the majority of the population will lead to social and economic instability. Transfer of wealth is an imperative for sustainable national development and it has been successfully applied in countries such as Malaysia, Norway and even U.S.A.

Review of the status quo revealed that there are still some firm challenges in empowerment of historically disadvantaged South Africans. Residual challenges persist in procurement, ownership, and women participation and employment equity. The principle of control was singled out as an area with the most serious concern and therefore needed review. This is especially apparent from the perception that most black executives are powerless in their positions and are mostly tokenenised without much influence and decision making powers in the oil companies.

The above challenges contributed to the creation of some special organisations to alleviate some of the problems. One such organisation is the State Owned Enterprises Procurement Forum (SOEPF) a forum of Procurement/Supply Chain Management heads of the state owned enterprises. It was created to form a platform for sharing best practices in the supply chain management within the SOEs. Some of its key objectives are to collaborate with industry in maximising BBBEE and ASGISA initiatives. These are some of the proposed areas of value addition.

Operational aspects include:

- Supplier Development
    - Develop a joint strategy & implementation model.
    - Pledge specific contracts for Supplier Development Programme (SDP)
- Black Economic Empowerment
    - Empower SASDA to provide business support services to BEE companies who are awarded contracts
- Skills Development
    - Empower SASDA to provide business support services to BEE companies who have been awarded contracts

- Job Creation
    - Assist with identifying opportunities for job creation from foreign procurement
    - Commit to decreasing foreign procurement expenditure by 20% per annum.
- Resources
    - Assist with office accommodation & related resources for Supplier Development

Strategic aspects include the following:

- Commitment needs to be made to a formal analysis of procurement spend across the energy sector, especially foreign spend through openness and information sharing.
- Commitment needs be made for the funding for Skills Development Plan (SDP) initiatives
- Commitment must be made to establishing at least 50 SDP companies with guaranteed contracts for at least 5 years

Additional insights from the discussion included that, the initially publicised commitments to BEE have not been achieved and therefore need revisiting. Aspects thereof are that

- BEE companies are calling for a structured system that duly recognizes those participants who have gone beyond the Charter obligations to deliver on transformation
- Introduction of an industry based structured system that rates the degree and extent of contribution (using the original Charter elements) e.g. Level 1, 2, 3, etc and rewards participants
- A deliberate emphasis on skills and recognition for participants that have created entities that are run, operated and controlled by HDSA, highlighting

their role in the hard issues (assets and facilities, refining, retailing and financing)

10.2.3 Key Outcomes

Further recommendations include:

- Changing of the reference to HDSA and replace it by black in line with BBBEE Act;
- Revision of SASDA's focus to include Minerals and Energy and State Owned Enterprises in a phased manner;
- Alignment of the liquid fuel charter and proposed the Act with BBBEE Act and Codes of Good Practice and set targets;
- Regulating utilisation of common suppliers and opportunities database;
- Procuring of goods and services by buyers using the common database to be made mandatory;
- Listing of procurement opportunities in the database to be regulated;
- SASDA to become an auditing agent on BBBEE compliance responsible for monitoring, evaluation and reporting on behalf of DME;
- Introduction of clear measurement targets and quarterly reviews; and
- Compliance to empowerment should form part of the licensing criteria by DME.

10.3 Appropriate Regulatory Framework to Facilitate Entry of Piped Gas into the Market

The purpose of the session was to obtain a view of the key factors that could be hampering development of the gas market and as also to assess whether the Gas Act was too stringent for a developing gas industry. It was also to explore possibilities for an appropriate policy framework to nurture this emerging energy sector.

10.3.1 EWP Policy Statement

The key policy position as stated in the Energy White Paper is that:

"*Given increased opportunities for energy trade, particularly within the Southern African region, government will pursue energy security by encouraging a diversity of both supply sources and primary energy carriers.*"

The Government's stated policy is to develop the natural gas industry, to legislate for the storage, transmission, distribution and trading of piped gas, and to develop a minimal regulatory regime 'consistent with the orderly development of a competitive gas industry'. The Government is therefore attempting to harmonise regional gas policies and establish bi-national agreements.

10.3.2 Assessment of Policy

Since 1998 the Gas Infrastructure Plan (GIP) effectively linked sources of gas to markets. The Integrated Energy Plan 1 (IEP 1) stated the need to diversify energy supply through increase use of natural gas.

The Gas Act of 2001 was in operation in 2005. The Act aims to promote the orderly development of the piped gas industry, establish a national regulatory framework, and establish the National Gas Regulator as the custodian and enforcer of the national regulatory framework. The Gas Act legislates for the storage; transmission; distribution and trading of piped gas and develops a minimal regulatory regime 'consistent with the orderly development of a competitive gas industry'. The Piped Gas Regulations were promulgated in 2007.

The National Energy Regulator (NERSA) was established in 2005. The bi-national agreements between South Africa and Mozambique; and South Africa and Namibia were concluded and the Gas Commissions was established in an attempt to harmonise regional gas policies. The South Africa/Mozambique pipeline was completed in 2004.

These are the main deliverables since 1998 and they are consistent with the Energy White Paper.

10.3.3 Summary of Deliberations and Key Outcomes

A view was expressed that the objectives of the Energy White Paper were still pertinent. Some achievement on EWP implementation includes the establishment of the single energy regulator.

It was also pointed out that the role of competition in key infrastructure had been questioned by some commentators and that Government should not "cherry pick" only those parts of the White Paper which they liked. It was also stated that publicly owned monopolies did not behave differently from privately owned ones and that competition for the market could be used in strategic infrastructure, for example, the tender process that government onn the implementation of the Independent Power Producers (IPPs).

It was further indicated that in order to facilitate private sector involvement, the independence of the regulator was of utmost importance and that Government needed to take a leading role in energy planning to promote competition within the energy sector. They also expressed that Government is responsible for policy development while the regulator is responsible for implementation and as such the regulator should be given room to exercise its discretion on certain issues within the given policy framework.

The natural gas sector was at a very difficult stage of development and additional legislation (for example subsidies) were required to kick start the industry. The analogy was made to a "chicken and egg situation" where there would be no market unless there was firm supply. . There may be a case for the state to invest in a pipeline in Western Cape.

Recently, an application from Rampco to add additional compression to its pipeline from Mozambique in order to increase gas sales to South Africa above the current limit of 120 million gigajoules per year, was lodged with the Energy Regulator. This indicated that there were investment into South Africa, however these were not enough. The issue of developing the gas industry involved a multitude of issues which emerged from different angles. These included technical issues, beneficiation issues, environmental issues and production rights

holders, who, in particular were subject to many existing laws. There was a lack of investment in this industry in the last ten years according to some very well known economical reasons. For instance the lack of price competition between alternative energy sources and gas such as electricity was a world issue. It was also indicated that South Africa had historically, and continued to have very low electricity prices by international comparison and that this factor, combined with the fact that South Africa also had cheap coal contributed to making gas less competitive during that time. Indications are that the electricity prices reflected the true cost of supply then natural gas would be most competitive.

The Issue of the review of the Energy White Paper was supported but it was pointed out that it was not incorporated into the shareholder's compacts of state owned enterprises. This was necessary since policy and shareholding are managed by different departments. The White Paper didn't translate into active participation by other government departments hence some of its objectives were difficult to achieve.

Some issues for further debate were raised during the deliberations. These include the definition of independence of regulators. It was pointed out that investors look for a predictable legal framework, fair and transparent implementation by the regulator when making investment decisions.

A view was held that the regulator could not be fully independent from the government because the Board or regulator members were appointed by the Minister. They indicated however, that the regulator must be transparent in all its proceedings and that its decisions should be predictable.

It was further pointed out that policy making should be separate from policy implementation.

Another view indicated that regulatory independence should have consumer protection, provide for industry viability, and implement government policy. Government is responsible for policy development while the regulator is responsible for making inputs and advises government, hence the regulator should act as consultant to the policy maker. The regulator must be independent

with some degree of using its discretion on certain issues within the policy framework. Relationship between the regulator and the regulated entities should be maintained.

10.3.4 Key Outcomes

- The Energy White Paper was supported but it was pointed out that it was not incorporated into the shareholder's compacts of state owned enterprises
- Facilitation of private sector involvement, in energy can be achieved through the independence of the regulator and the lead role by government in energy planning
- Policy making should be separate from policy implementation.

10.4 Integrated Household Energy Strategy

The purpose of the session was to deliberate on key aspects that needed to be addressed with respect to the application and use of energy in households.

10.4.1 EWP Policy Statement

"Government will promote access to affordable energy services for disadvantaged households, small businesses, small farms and community services."

"Government will promote access to basic energy services for poor households, in order to ameliorate the negative health impacts arising from the use of certain fuels."

"Government will work towards the establishment and acceptance of broad national targets for the reduction of energy-related emissions that are harmful to the environment and to human health."

"Government will ensure a balance between exploiting fossil fuels and maintenance of acceptable environmental requirements.

Government will seek, as a matter of priority, to mitigate the negative environmental and health effects of air pollution from coal and wood use in household environments."

"Government will, where resources are available, undertake information and education programmes on energy and the environment and provide assistance to others in developing and implementing such programmes and other economically viable alternatives."

10.4.2 Summary of Deliberations

One presentation focused on the international experience of renewable energy and its application in the household sector. The presentation highlighted the need to focus on the use of fuels for cooking and heating. Energy poverty within households was noted by mentioning that three billion households worldwide relied on biomass. It was also pointed out that air pollution was the major cause of mortality and that the challenge was the solutions to address this are not clear cut.

It was pointed out that improved woodstoves are theoretically a solution; however these were currently not commercially available. It was also pointed out that international studies indicated that government support tended to be more effective in terms of the development, production, distribution set up of the commercialisation chain rather than directly subsidising the stove itself. In certain cases subsidies had often benefited the people that have rather than the poor as they simply, in most cases, could not even afford the subsidised products.

A presentation by the DME indicated that although electricity was provided in certain areas, in most informal settlements, people still made use of coal irrespective of the availability of electricity. This highlighted that although efforts had been made to make electricity more accessible, it still wasn't affordable to many. The approach from the Energy White Paper and the Department's view was that a holistically approach to energy provision was required. This approach should not only consider a single energy carrier as a solution to energy needs but should also look at the full spectrum of energy carriers, lifecycle costs as well as

affordability and sustainability of subsidies are some of the key factors that need to be considered. Other considerations include safety, health, environment and quality factors. Other factors that need to be considered include infrastructure networks and distributing channels.

Another presentation focused on the safety and health aspects relating to the use of paraffin and paraffin stoves. It was also highlighted that the review of the Energy White Paper needed to assess whether the constitutional right to South Africans that says "everyone has a right to an environment that is not harmful to their heath and well-being" had been addressed. It was also highlighted that poor households tended to use a multiplicity of energy carriers and the safety and health aspects of all these carriers need to be considered and addressed.

Another presentation highlighted that people often equated energy with electricity and it was very important that it be realised that this is not the case. The presentation outlined some of the key advantages of LPG which include the fact that LPG is portable and highly efficient, safe and convenient to use.

The World Health Organisation (WHO) had endorsed LPG as the most cost-effective solution for reducing pollution.

However, it was also pointed out that it was important to come up with a lighter LPG canister and also important to make it even more accessible to all consumers. The immediate need is seen to be in the rural areas. It was also indicated that internationally the domestic application of LPG was almost 50% while in South Africa this was only at around 3%.

Another presentation highlighted that there was no integrated household energy strategy and there was a need for such. The draft free basic alternative energy (FBAE) policy which is an excellent idea has been on the table since 2005, and it is still not implemented. Other points which were raised are that:

- Free Basic Electricity is available to fewer households than before and clarity was required to assess whether free basic alternative energy pilots worked.

- Solar Home Systems are not reaching the poor because subsidies are unfairly allocated
- LPG is currently not affordable to poor households
- IP increased in price because of crude and stoves were taken off market without warning
- Gel fuel has been found to be 3 times the cost of IP
- Although 64% of households use fuel wood the DME still refuses to recognise it as a fuel
- DME should consider the plight of HIV/AIDS households using wood
- There is a need for an equitable strategy
- New houses should be thermally efficient and equipped with solar water heaters

10.4.3 Key Outcomes

- An integrated household energy strategy does not exist and this needs to be developed by Government.
- There is a need to take a holistic approach to an integrated household strategy that considers the most appropriate energy sources for the most appropriate application or end use.
- Government leadership is essential in ensuring the successful rollout and expansion of the LPG market.
- LPG should be used to service both the urban and rural market and should form part of the DSM.
- The revised White Paper on energy policy must provide for the establishment of a Household Energy Safety Strategy.
- The DME should take leadership over the interdepartmental collaboration, to regulate the Paraffin Industry, implement safety awareness and give attention to poor household.

- The rollout of safe IP appliances as an intervention to address power supply problems for cooking and heating, especially in the residential sector, must be considered. IP should be considered as a part of the solution for DSM.
- Safety considerations for IP should include the packaging, labeling and well as education and awareness of consumers. The packaging and labelling of paraffin should be regulated.
- Unsafe appliances should be outlawed and the DME needs to work with the SABS to develop and enforce standards.
- Government should be involved with educating consumers on safety, because if it left up to the NGO's without adequate backup from Government, then the whole initiative collapses.

11. Integrated Energy Planning

11.1 Energy Modeling and Planning Approaches

The purpose of the session was to deliberate on the best approach for national integrated energy planning and modelling, taking into account other countries' experiences. Various entities developed separate plans and discussions were focused on establishing mechanisms for the integration and coordination of energy modeling and planning activities as a way of ensuring alignment between different plans that exist.

11.1.1 Energy White Paper Policy Statement

The Energy white Paper makes it clear on what was expected with respect to integrated energy planning and modeling. The greatest challenge with regard to integrated energy planning was with regard to the implementation thereof.

"Government will facilitate the provision of the necessary resources to establish IEP structures and systems to develop energy policy."
Government will ensure that the necessary resources are made available to establish structures and systems, and put in place legislation to facilitate the specification, collection, acquisition, storage, maintenance and supply of energy

data, and energy-related data, according to the requirements of integrated energy planning and international standards. Government will facilitate the establishment of information databases.

The proposed policy position is that integrated energy planning as espoused within the Energy White Paper is still valid. Government needs to focus on putting in place mechanisms for ensuring the successful implementation and delivery of an Integrated Energy Plan. The White Paper also recognized that the critical success factor for Integrated Energy Planning was the availability of vast amounts of accurate and relevant data and analysis. It also recognized that South Africa has a data scarcity and that measures needed to be put in place to ensure the collection, storage and publishing of relevant energy data.

11.1.2 Summary of Deliberations

One presentation indicated that additional 40 000MW electricity has to be generated by 2025 and existing capacity has to be upgraded. The Energy Security Masterplan was intended to address issues relating to the demand, supply, macro-economic as well as environmental factors in a holistic manner. The Energy Bill which was in the process of being drafted envisaged an Energy Modeling Agency which would undertake energy modeling for the purposes of integrated energy planning under the DME. Areas of influence will be Trade and Industry, Housing, Transport, Government Departments, Renewable Energies, Liquid Fuels and Electricity. New electricity capacity plans do not address the liquid fuels required.

Another presentation highlighted that a pyramid of plans existed within the energy sector: at the top of the pyramid were those of Government, with those of NERSA, Eskom and the municipalities following respectively. It was highlighted that each of these entities was responsible for its own plans with each plan serving its own purposes. However there was a vacuum in the planning hierarchy as there was a lack of integration of all these plans. More flexibility is required in planning and all plans should be based on scenarios that were based on a single set of assumptions. Externalities such as social impacts, environmental factors

as well as technology needed to be included and considered as part of the planning process.

It was also indicated that the National Energy Modeling System (NEMS) of the US was not a plan but was a system that could assist in the planning process. It was highlighted that baseline projections needed to be clear and alternative baselines could be used. Data, resources and an understanding are important in modeling. MARKAL was discussed as optimisation model versus NEMS as a planning model. A suggestion indicated that South Africa may want to consider using MARKAL since several countries have adopted it.

Another point which was made was that Integrated Energy Planning (IEP) is a process and not a product and that if one tried to plan in a crisis then this was too late. Data collection must be a long term project which has to be systematic and there also needs to be a clear and dedicated owner of data. Any analytical tool is time consuming and expensive with a range of skills required and it is a challenge to integrate all these.

Other input which was made required clarity on whether a modeling tool had been decided upon and it was highlighted that IEP1 had failed and IEP2 process was not seen to completion.

Comments were also made that due to the small size of the domestic market, the balance between economic growth and economic well being needed to be maintained as such South Africa needed to clarify whether it was pursuing a capitalistic, socialistic or mixed economic approach. African countries and people do not have access to their own resources and this should be a key consideration to be taken into account when planning. Other externalities such as climate change, renewable energy and energy efficiency targets needed to be factored into the models and as a result planning processes.

11.1.3 Key Outcomes

Some salient points of the session are outlined below.

- Integrated Energy Planning (IEP) is a process and not a product and that if one tried to plan in a crisis then this was too late.
- The role of SANERI and other research institutions in the planning process needs to be clarified. A centralised place to house the data is required. A regulatory framework to enable the collection and provision of energy data needs to be put in place.
- An energy supply standard is needed, i.e. reserve margins, trade, imports, etc.
- Transparency was required in the types of data and assumptions that underpinned certain decisions (for example the calculation of the additional electricity generating capacity required in future)
- Planning must be done at all levels. The Regulator for example, must submit its plans to Government. The regulator must manage and coordinate the Integrated Resource Planning (IRP) process. The Regulator should recommend the NIRP to Government. Government should direct and finally approve the NIRP.

SECTION 3: SUMMIT CLOSURE

12. Summit Declaration

During the announcement of the Energy Summit declaration it was highlighted that it was apparent that some of the assumptions that underpinned the development of the Energy White Paper need to needed to be interrogated. The views which were presented by various stakeholders during the summit were acknowledged as an important input for future policy development, noting that energy security was about ensuring that diverse energy resources in sustainable quantities and at affordable prices are ma de available to the South African economy in support of economic growth and poverty alleviation taking into account environmental management requirements and interactions amongst economic sectors. In light of this, the declaration of the summit was read as follows:

The declaration was made to make commitment to:

1. increasing access to affordable and energy services;
2. improving energy governance;
3. stimulating economic development;
4. managing energy related environmental impacts; and
5. ensuring energy security.

It was indicated that the Energy Summit presented an opportunity to take the issues which were raised during the deliberations forward and that the Department of Minerals and Energy was committing:

- to improving cooperation and coordination between the South African Government departments as well as all spheres of government to ensure integrated planning;

- the South African Government Departments and all three spheres of Government to support institutional arrangements for transformation as well as effective regulation of the Energy Sector; and
- the Minister and the Director General of Minerals and Energy to developing policies that take into account the inputs and the insights that would emanate from the proceedings of the summit.

13. Statement by Youth

The Children's Energy Summit was held concurrently with the National Energy Summit. The statement by the Youth outlined the key challenges that have been identified with regard to each of the key objectives of the Energy White Paper. Recommendations on how each of the objectives could be addressed were also made.

Objective 1: ***"Increasing Access to Affordable Energy Services"***. The key issues that emerged related to this objective were that electricity in South Africa is not affordable for poor households and that it is also not accessible in rural areas.

The recommendations which were made in order to achieve this objective were that:

- South Africa should maximise diversification of energy supply;
- South Africa should subsidise solar panels in new housing developments where this is appropriate; and
- South Africa should institute equitable access to energy supply between rural and urban areas.

Objective 2: ***"Improving Energy Governance"***. The key issues which emerged related to this objective were that new developments deplete woodlands and this was exacerbated because focus on the planting of trees was negligible. The Youth also indicated that there was a lack of community-based structures to address energy issues and that power outages interrupted

education and health care services. It was also highlighted that the theft of electricity threatens the safety of children and that there were inadequate measures and standards in place to ensure compliance with electricity installations. This in turn threatened the safety of end users and more specifically their children.

The recommendations which were made with regard to this objective were that:

- tree cutting should be regulated;
- school buses should be subsidised;
- municipalities should facilitate the establishment of community-based energy centres and DME should provide technical support which would be required at these centres;
- there must be preventative measures to pre-empt outages and minimal turnaround time to fix outages;
- people who use electricity illegally (izinyoga) must be prosecuted; and
- The Government should prioritise electricity supply in farms and in rural areas.

Objective 3: *"Stimulating Economic Development"*. The key issues which were raised with regard to this objective were that the lack of electricity has a negative impact on the provision of essential services; it also stifles economic development, and in rural areas, leads to the increased migration of people to urban areas.

The recommendations which were made were that:

- the Government should provide reliable basic services in all areas;
- the Energy Supply Industry should ensure efficient services in the country; and
- communities should be empowered to explore opportunities for 50/50 shareholding within the Energy Supply Industry.

Objective 4: ***"Managing energy related environmental impacts"***. The issues which were highlighted were that South Africa is the largest greenhouse gas emitter in Africa; Illuminating paraffin is dangerous to children and their families; and that there was a high level of energy consumption; and pollution caused by automobiles was increasing.

It was recommended that:

- the DME in partnership with children and society should heighten awareness on energy efficient principles and practices;
- Government should develop safety standards for product design; and
- packaging of paraffin and other energy products should adhere to safety standards and that this should also accommodate the needs of children and people with disabilities.

Objective 5: ***"Security and Supply through diversity"***. The key issues that were highlighted were as follows:

- The potential of gel-fuel needed to be explored further as there was a need for South Africa to reduce its disproportionate reliance on coal for the production of energy;
- There was a need to regulate the provision and pricing of alternative sources that undermine diversification; and
- There was a need for South Africa to explore regional energy to secure sustainable diversification of energy supply.

The following recommendations were made with regard to the above objective:

- Further research is required to strengthen knowledge on gel fuel technology;
- South Africa should commit to increase targets for renewable energy sources by 2015;

- South Africa should regulate the provision and pricing of alternative energy sources; and
- South Africa has to strengthen regional trend agreements to secure diversity of energy supply.

The Youth concluded by indicating that their participation in the Children's Summit and their voice in the National Energy Summit, affirmed the right of children and youth to participate in national, regional and international processes.

14. Statement by Women

The women's representative commended the establishment of the Woman in Oil and Energy South Africa (WOESA), whose main aim was to do advocacy work and engage women in activities in the energy sector and pointed out that this was one of the DME's interventions in the implementation of women's internationally acclaimed policies, was

It was also noted that the Energy White Paper of 1998 already acknowledged the role of women in the energy sector, however she highlighted that there was very slow progress in its implementation. However women are confined and relegated to household energy subsidies rather than given the opportunity to enter the entire value chain and even the issues raised at the summit were an indication of this.

It was further indicated that the pending Energy White Paper policy review by the DME presented an opportunity for the policy gaps with specific attention to women empowerment in the energy sector to be addressed and for specific targets to be set. The women's demands from the summit were outlined as follows:

- That women be seen as an integral part of the energy sector;
- That women's organisations be given an opportunity to engage in future policy discussion platforms;

- That women be considered for technical training, mentoring and support programmes within the energy sector;
- That access to funds, including capital funding for women-led businesses or cooperatives be intensified;
- That a deliberate effort be made to develop and fund women's organisations dealing with empowering women in the energy sector;
- That WOESA be empowered in order for it to empower other women and to fulfill its mandate; and
- That the development and implementation of policies and programs to develop women in rural areas was very important. She emphasised the need for serious resources required to get to the rural areas and therefore that the issue needed to be taken seriously.

In conclusion, it was indicated that the list of demands was in no way exhaustive with regard to the challenges of women's participation in the energy sector and that the energy sector was still a very difficult one for women to enter. However WOESA commended the Minister of Minerals and Energy, Ms Sonjica for her initiative in convening this all important summit.

15. Closing Remarks

The closing statements of the National Energy Summit of 2007 were made by the Director General of Minerals and Energy as well as the Minister of Minerals and Energy.

15.1 Director General's Closing Remarks

The Director General indicated that without any fear of contradiction, the future of the energy sector was in good hands. He indicated that it was therefore important that all must be careful of the legacy that they were creating and would therefore bequeath to the young citizens of South Africa. He indicated that the children had participated in shaping the legacy and that it was not usual for one to participate

in the creation of that which he or she would inherit. In closing he thanked the children for their contribution.

15.2 Minister's Closing Remarks

The Minister indicated that investment had been made on the children in terms of leadership. She indicated that the start of the Energy Summit marked the beginning of a process of deliberations on the life of our economy, a review of the energy situation in South Africa. She indicated that the issues that were deliberated upon ranged from those on the role of the State in the energy sector to competition in the electricity markets, and also indicated that there was a need for more communication on nuclear issues. It also emerged from the summit that cooperative governance is vital for energy security, particularly around energy infrastructure.

The Minister highlighted that at various stages of the summit, a continual reminder that we live in a development of state, a state in transition and that solutions that we propose must take into cognisance the need to lift the majority of our people out of poverty was required. She indicated that this should always guide proposed interventions in the energy sector and that there was a need to ensure that the primary objectives of the Energy White Paper were realised within the context of the theme of the summit "***Energy Security for Sustainable and Shared Economic Growth for all***".

The Minister further emphasised that the major responsibility was to deliver energy to all South Africans ensuring affordability, reliability and accessibility. She further indicated that the DME was committed to continue pursuing programmes of delivery of universal access, to making clean energy available to the poorest as well as resolving issues of paraffin and its safety and also highlighted the need to look at issues of LPG and its affordability. She emphasised that although the DME was committed to mainstream agenda, there was much room for improvement in the area of gender and mainstreaming thereof and that the DME committed to continue investing in the future of the country by investing in children.

The Minister indicated that another key issue that emerged clearly from the summit was the need for State intervention in the energy sector and the divergent views on the execution of the intervention. She stated categorically that in instances where energy security may be compromised, the State would intervene and would do so decisively.

The Minister indicated that the DME realised and appreciated the importance of energy efficiency in dealing with climate change issues as well as the importance of involving the children and ensuring that the children are knowledgeable about energy issues would go a long way in helping the DME with its energy efficiency campaign. She also indicated that the establishment of partnerships in issues of energy efficiency was crucial and quoted the Director General of Transport when she said *"we need to align policy"* and that *"we need to include transport energy in the energy efficiency campaign"* and indicated the need to extend this partnership to local government.

The Minister posed the following questions: *"To what extent did we take into account the global supply chain bottlenecks? How do we convert these bottlenecks into opportunities for job creation in our own country, by means of fabrication shops that employ artisans? How do we position our industries to take advantage of the one trillion spend that is projected in the sector over the next 20 years and those industries would include the small industries?"*

The Minister pointed out that she needed to correct a point which emerged during the deliberations relating to energy minerals where the unions raised concern about job security for their members should there be a move from coal to uranium for electricity generation. She indicated that as much as they were concerned about job losses they should also be equally concerned about the creation of jobs. This was because, she continued, the use of both of these minerals was projected to increase in the next 20 years and therefore the mining of coal would not decrease, but instead there would be an increase due to the projected energy demand. She also indicated that at the same time there would also be an increase in uranium mining thereby leading to the creation of