GENERAL NOTICE

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Department:
Minerals and Energy
REPUBLIC OF SOUTH AFRICA

OUTCOMES OF THE NATIONAL ENERGY SUMMIT

HOSTED ON
25TH TO 27TH SEPTEMBER 2007

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.