A New Era For Eskom

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New Era Defined

- Uncertain and volatile global energy context
- Electricity capacity and energy shortage
- Emergence of Independent Power Production
- Rising energy prices
- Energy insecurity
- Climate change impact and future concerns
- Global competition for skills and plant

Are we in a new Era or are we in a cycle which repeats itself every 30 years?
2007 IEA Global Energy Study conclusions

- World’s primary energy needs will grow by 50% by 2030

- China and India are the emerging giants of the world economy and international energy markets

- The consequences of unfettered growth in global energy demand are alarming

- Collection action is needed to address global energy challenges
  - Climate change
  - Local pollution
  - Energy insecurity

- Challenge for all countries is to put in motion a transition to a more secure, lower carbon energy system, without undermining economic and social development
Decline in reserve margin over past decades

Impact of 3000 MW reduction

Eskom
Overall Need to take 3000MW off the Demand Profile

Total Energy required to be taken out of the demand profile in 2008 – 3000MW at 0.75 load factor

A reduction of 3000 MW will create the required short term system buffer, giving opportunity for maintenance, accommodate growth and some operating reserve.
Forecasts

Additional 40 000MW added to current capacity

Long term forecasts - national + foreign

- Eskom position based on 4% growth electricity growth supporting 6% GDP growth
- Eskom moderate position 2.3% electricity growth based GDP growth of 4%
Policy objectives

- Adequacy criteria
  - Setting probabilistic or deterministic target
  - Generation Plant Reserve Margin 15% - 19%
  - Fuel security standards

- Promotion of energy efficiency

- Sustainability
## Target generation portfolio

<table>
<thead>
<tr>
<th>Resource Option</th>
<th>Approved range by 2026</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coal</td>
<td>&lt;70%</td>
</tr>
<tr>
<td>CCGT</td>
<td>Build for security of supply</td>
</tr>
<tr>
<td>Nuclear</td>
<td>2,5% - 28%</td>
</tr>
<tr>
<td>Pumped Storage</td>
<td>4 - 10%</td>
</tr>
<tr>
<td>OCGT</td>
<td>Build for security of supply</td>
</tr>
<tr>
<td>Imported hydro</td>
<td>2 - 15%</td>
</tr>
<tr>
<td>Renewables</td>
<td>&gt;2%</td>
</tr>
</tbody>
</table>

- Reduced reliance on coal
- Nuclear strategy and renewables focus
- Pumped Storage requirements
- Imported hydro levels
Diversify primary energy mix

Existing

Mix by 2025

- Coal
- OCGT
- Nuclear
- Renewable Energy
- Imports
- Pumped Storage
New Build Programme

- Return to Service:
  - Camden: 7 of 8 units in commercial operation
  - Grootvlei: 2 of 6 units in commercial operation by end May
  - Komati: 9 units, none in commercial operation as yet

- Coal Fired Plant: Medupi and Bravo approved. Units coming on line over 5 year period 2012 – 2016

- Wind Power: 100 MW wind farm by 2010

- Pumped storage plant: Ingula on line by 2013

- Open Cycle Gas Turbines: Doubling of capacity at Ankerlig and Gourikwa from 2009

- Nuclear programme: Commercial process underway for PWR design
Non-Eskom generation

- In 2003, Cabinet decided that 30% of new power generation will come from IPP’s.

- In September 2007, Cabinet designated Eskom as the Single Buyer of power from IPP’s.

- Single buyer model in effect
  - Cogeneration
  - Medium Term Power Purchase programme
  - Multiple Site Base Load IPP Programme

- Government process for appointment of peaking plant IPP
Demand side management

- Current energy supply-demand imbalance

- Energy efficiency
  - Residential sector
    - Greater scope but smaller impact on the system
  - Industrial sector
    - Small improvements but greater impact on the system

- Focus on pure efficiency savings, not load shifting

![Graph showing Eskom Target and Achieved values from 2005 to 2008]
Power conservation programme

- Rationing of power consumption by 10%
- A quota – based system with penalties
- Potential to promote efficiency by encouraging reduction of wasteful consumption
- Effect on longer term growth
Drivers of electricity price increases

- Cost of long term build programme
  - 40 000MW in 20 years

- Cost of medium and short term mitigating programmes
  - Build programme will become a significant component after Medupi comes on-line

- Cost of fuels (coal and diesel)
  - Cost of primary energy will contribute significantly

- Operating costs will play a smaller role as we move down the timeline

- Impact of price increase
Electricity Prices

Eskom nominal and real electricity prices by calendar year
CPI and PPI base 2000=100

Note: price = revenue for year/sales for year
The index represents the overall price and includes both the energy and network components.
Electricity-GDP relationship

SA electricity sales growth vs GDP growth

Source: StatsSA and SARB
Electricity intensity

SA electricity intensity

(Electricity available for distribution per unit of GDP)
<table>
<thead>
<tr>
<th>Imports</th>
<th>Country</th>
<th>Approx MW</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>DRC</td>
<td></td>
<td>200</td>
<td></td>
</tr>
<tr>
<td>Zambia</td>
<td></td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Cahora Bassa</td>
<td></td>
<td>Up to 1400</td>
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</tr>
<tr>
<td>Firm Exports</td>
<td>Botswana</td>
<td>350</td>
<td>Shed as per SA customers</td>
</tr>
<tr>
<td></td>
<td>Swaziland</td>
<td>180</td>
<td>Shed as per SA customers</td>
</tr>
<tr>
<td></td>
<td>Lesotho</td>
<td>24</td>
<td>Shed as per SA customers</td>
</tr>
<tr>
<td>Un-firm Exports</td>
<td>Namibia,</td>
<td></td>
<td>Not supplied when we are shedding</td>
</tr>
<tr>
<td></td>
<td>Zimbabwe,</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SA Customer in Mozambique</td>
<td>Mozal</td>
<td>900</td>
<td></td>
</tr>
</tbody>
</table>
Water and Electricity Do Mix

- Water and electricity are amongst each other’s biggest consumers
- Utilities have committed to use less of each other’s product
- Co-operation on conservation drives within consumer base
- Joint utility services
- Universal access
Eskom/Municipal Task team met on 06 May 2008. It was agreed that the following issues will receive priority attention:

- Measurement and baselines
- Tariffs and incentives (specifically for the crisis)
- Water heating management – priority technology
- DSM funding process – Global application for funding for key issues
- New Connections, dealing with this consistently
- Communication – Consistent message, Customer education
- Non – payment (Non-technical losses)
- Technologies – smart metering, lighting etc.
- Legal framework

Task Team established to look at the key high impact activities with a common approach and the funding requirements.
Conclusion

- The balance between security of supply and affordability of supply is difficult in a capital intensive long-lead time industry.

- The adaptation required for climate change has significantly influenced the technology choices.

- Global interconnectivity and pressure for primary fuel security has significantly influenced the cost dynamics.

- The intense build activity globally has exacerbated the cost pressure.

- To ensure a balance of power and robust choices for the future, a least regret planning approach is required.

- We need to define the Era we want and move towards it.
Future Era Needed

- Energy affordability, adequacy and security
- Entrenched energy conservation
- Diversified energy economy in SA
- Energy productivity
- Strengthened regional co-operation to the benefit of all
- Cost reflective pricing with protection for the poor
- Environmentally, economically and socially responsible investment decision making
- Innovative solutions developed and implemented
The figures on this clock are approximations based on past stats and estimates. They are calculated from the beginning of the selected time period until the current time.
Thank You