Keeping the lights on – a partnership approach

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Integrated Demand Management (IDM)

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Cold snaps in 2011 winter have been short
Demand has been below forecasts
Large power users had reduced demand
Electricity demand growth was 1.4%
Increased efficiency in Eskom customers
Peak demand reached over 37 000 MW
Non-Eskom generation signed up

In total about 600 MW of non-Eskom generation was in production through winter.

Eskom supporting two municipalities to operate their generation plant – 515 MW signed up and about 300 MW operational in the last month. Final Medium Term Power Purchase agreement signed, bringing total to 376 MW (agreements with Sasol (240 MW), Sappi (35 MW), Ipsa (13 MW), Tangent (85 MW) and TSB Sugar (2.9 MW))

- Average cost of 76c/kwh for non-Eskom generation (53c for Eskom) indicates real price of generating electricity from brownfields projects
- Government’s Integrated Resource Plan creates framework for introducing further IPPs; Renewable Energy IPP programme has taken a major step forward with the issuing of Requests for Proposals
Local outages a winter challenge

No national load shedding, but local distribution interruptions to supply in certain regions.

Severe weather – snow storms, heavy winds - caused short supply interruptions in parts of KwaZulu Natal, Eastern Cape.

Majuba power station cut off by snowfall.

Local outages caused mainly by overloading and illegal connections in densely urbanised areas.

Protest sparked by tamper-proof “split” electricity meters and perceived high tariffs.

We are strengthening network infrastructure, investing about R10 billion a year in Eskom’s distribution network.

Working with stakeholders in Gauteng: Joint task team with local government under the leadership of DPE.

Strategy to combat illegal connections and electricity theft showing results.
### Expected system status

<table>
<thead>
<tr>
<th>Date</th>
<th>Weekly Peak Forecast</th>
<th>System Status</th>
<th>500 MW mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>22-Aug-11</td>
<td>34783</td>
<td></td>
<td></td>
</tr>
<tr>
<td>29-Aug-11</td>
<td>34707</td>
<td></td>
<td></td>
</tr>
<tr>
<td>05-Sep-11</td>
<td>34493</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12-Sep-11</td>
<td>34373</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19-Sep-11</td>
<td>34028</td>
<td></td>
<td></td>
</tr>
<tr>
<td>26-Sep-11</td>
<td>33875</td>
<td></td>
<td></td>
</tr>
<tr>
<td>03-Oct-11</td>
<td>33450</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10-Oct-11</td>
<td>33612</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17-Oct-11</td>
<td>34064</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24-Oct-11</td>
<td>33220</td>
<td></td>
<td></td>
</tr>
<tr>
<td>31-Oct-11</td>
<td>33466</td>
<td></td>
<td></td>
</tr>
<tr>
<td>07-Nov-11</td>
<td>33302</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14-Nov-11</td>
<td>34074</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

A **green** week indicates that demand and all reserve requirements can be met with all installed capacity (including the Open Cycle Gas Turbines).

A **yellow** week indicates that there is up to 1,000 MW shortage of meeting the demand and reserves. There is an increased probability of requiring some emergency reserves to meet the peak demand.

A **orange** week indicates that there is between 1000 and 2000 MW shortage of meeting the demand and reserves. There is a high probability of requiring substantial emergency reserves to meet the peak demand.

- Demand reduction or additional supply options will improve the situation for the tighter weeks as indicated in the various columns above.
- The status indicated above may change if there is a change in the demand from that forecast, which is dependant predominantly on weather and large customer behaviour.
- As the generation outage plan is modified the above picture will also change.
Our build projects are powering ahead

With more than a year to the planned first power from Medupi, we are doing a detailed assessment of the schedule ensuring that contractors meet timelines.

We are focusing systematically on supplier performance, so we can pick up and mitigate any risk factors early on; also understanding impact of labour situation on the project.

- Significant milestones reached: first generator at Medupi, dams at Ingula, Grootvlei completed, Komati three units operational.

- These are big projects with big risks: we are on alert!
This is Medupi
Keeping the lights on: The next seven years

Energy Supply Gap assuming Base Case Options materialise

<table>
<thead>
<tr>
<th>Year</th>
<th>Energy Gap (TWh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>-6</td>
</tr>
<tr>
<td>2012</td>
<td>-9</td>
</tr>
<tr>
<td>2013</td>
<td>-3</td>
</tr>
<tr>
<td>2014</td>
<td>-2</td>
</tr>
<tr>
<td>2015</td>
<td>-1</td>
</tr>
<tr>
<td>2016</td>
<td>1</td>
</tr>
<tr>
<td>2017</td>
<td>1</td>
</tr>
</tbody>
</table>
Eskom is working towards its IDM objectives through:

- **Innovation:**
  - Creating an innovative portfolio of IDM initiatives and funding mechanisms

- **Delivery:**
  - Using Eskom and national resources to deliver IDM initiatives in all sectors

- **Transparent Communications**
  - Transparent communications of nature of electricity crisis

- **Partnering**
  - Partnering with stakeholders to contribute to energy efficiency
Benefits of IDM

- Cost effectiveness
- Positive environmental impact
- Quickest time to implement
- Technology
- Positive economic impact
- Economic Growth
- Job Creation
- Public awareness
Eskom taking lead in public awareness and communications
ESKOM 49MILLION GLOW-IN-THE-DARK BILLBOARDS

The Eskom 49Million initiative encourages all South Africans to find ways to save electricity wherever and whenever they can. To demonstrate this, we delivered this message without using any electricity whatsoever… Using glow-in-the-dark billboards. A simple solution that helps people think differently about saving electricity.
Past Achievements
Targets, Year to Date and Cumulative Verified Demand Savings (MW)

Total Verified Demand Savings since inception:
2 717 MW
Demand Savings = 355 MW

- Residential: 204 MW
- Industrial: 113 MW
- Redistributor: 33 MW
- Agriculture: 4 MW
- Commercial: 2 MW

2010/2011
1. Relative electricity savings per R spent

R/MW spent per Initiative

<table>
<thead>
<tr>
<th>Initiative</th>
<th>R/MW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compact Fluorescent Lamps (CFL’s)</td>
<td>2</td>
</tr>
<tr>
<td>Shower Heads</td>
<td>3</td>
</tr>
<tr>
<td>Demand Reduction</td>
<td>4</td>
</tr>
<tr>
<td>Heat Pumps</td>
<td>5</td>
</tr>
<tr>
<td>SWH – High Pressure</td>
<td>6</td>
</tr>
<tr>
<td>SWH – Non Pressure</td>
<td>40</td>
</tr>
</tbody>
</table>
The IDM energy savings target for 2011/12 could power a city for a year

1,280 Gigawatt hours

either of

Buffalo City
(1,305 GWh consumed during 2006)

Mangaung
(1,397 GWh consumed during 2006)

for ~1 year

or

Sol Plaatjie
(514 GWh consumed during 2006)

for 2½ years

Source: Annual electricity consumption/sales as reported in the State of Cities 2006, City Energy Support Unit, Sustainable Energy Africa, 2006
Technology equivalents to achieve 313 MWs 2012 Financial Year

<table>
<thead>
<tr>
<th>Technology</th>
<th>Number of units</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>LED downlights in commercial facilities</strong> based on data from current pilot</td>
<td>15,550,000</td>
</tr>
<tr>
<td><strong>Heat pumps for residential use</strong> based on empirical values used in planning</td>
<td>896,935</td>
</tr>
<tr>
<td><strong>Solar Water Heater</strong> with timer based on M&amp;V data</td>
<td>High pressure systems: 572,680</td>
</tr>
<tr>
<td><strong>Commercial efficiency upgrades</strong> average based on 110 competed projects</td>
<td>394</td>
</tr>
<tr>
<td><strong>Industrial efficiency improvement</strong> projects average based on 72 completed projects</td>
<td>223</td>
</tr>
<tr>
<td>Current Funding Mechanisms and Initiatives</td>
<td></td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td></td>
</tr>
<tr>
<td><strong>ESCo Process</strong></td>
<td><strong>Rebates</strong></td>
</tr>
<tr>
<td>Size</td>
<td>Projects &gt; 1MW</td>
</tr>
<tr>
<td>Eskom Payment Value</td>
<td>Based on individual project calculation</td>
</tr>
<tr>
<td>Funding</td>
<td>Customer and Eskom (up to NERSA benchmark)</td>
</tr>
<tr>
<td>Payment</td>
<td>Progress payments to ESCo's</td>
</tr>
<tr>
<td>Investment Decision</td>
<td>Individual IC approval</td>
</tr>
<tr>
<td>Procurement Decision</td>
<td>Price evaluation based on submitted approval</td>
</tr>
</tbody>
</table>
Current Pipeline Position – Industrial Sector

- Projects with a demand savings of 232MW are in the IDM pipeline – either in implementation or in the approval process.
Projects with a demand savings of 47MW are in the IDM pipeline – either in implementation or in the approval process.
Standard Offer Projects Registered
2012 Financial Year

![Graph showing the number of projects and demand savings (MW) per month for April to August.](image)
Standard Offer Projects Registered (Inception to date)

- **42** projects
- **15** MW savings

Includes all projects including those registered during the initial pilot phase in 2010 and August to date
We started with lighting

Extension of standard product offer to include:

- Air conditioners
- Solar water heaters
- Heat pumps
- Shower heads
Standard Product Projects Registered
2012 Financial Year

No. Of Projects vs. Demand Savings (MW)
Standard Product Project Progress (Inception to Date)

115 projects
4.9 MW savings
Currently, solar PV and wind power dominate the renewable market in South Africa. Both offer capacity factors of approx 20%.

Eskom is considering the contribution of small scale renewable energy to SO and SP pilot initiatives. This would be subject to NERSA approval.

IDM’s expectation is for renewable energy to contribute between 2.5 and 5 MW until 2013.
Waste heat recovery enables economic and ecological efficiency improvements

The **recovery of heat** and water in the production process and reintroducing these streams back into the originating process offers **significant improvement to the efficiency of the operation** and ultimately makes **business sense** as the costs are reduced.

**67%**

percentage of E2PM* participants, who identified waste heat recovery as a key efficiency intervention (second most common intervention in the programme)


* Eco-Efficiency Program for Manufacturers (E2PM) that ran from 1998 to 2009.
LED technology is making strides and offer the next tier of energy improvements in lighting.

- 11 million conventional downlighters in the market.
- 4.6 million of the 11 million are in the commercial/Industrial market.
- 2.6 million of the conventional installations are targeted for LED retrofits.
- 55 MW peak demand savings potential could be realised.
- 160 GWh per annum energy (per million) could be realised.

Source: http://www.blowzone.co.uk/contemporary-led-chandeliers.php
Partnering together

Demand Management
Ripple and Radio Hot Water Load Control
IDM is implementing 183.94 MW worth of demand savings

Efficient Lighting (CFL) Mass rollouts
Over 47 million installed saving over 1800MW

Marketing and Awareness

Solar Water Heating Rebates and Mass rollouts
Over 200 000 installed
Partnering together – additional opportunities

- Street lighting
- Smart metering
- Renewable energy / net metering
- COP-17
Thank You