there is energy intelligent life out there.

Global Developments
Reasons for Energy Efficiency

- Cost effectiveness
- Positive environmental impact
- Quickest time to implement

- Technology
- Economic impact
- Economic Growth

- Public awareness
- Job Creation
Eskom’s DSM programme has evolved to a strong focus on energy efficiency.
need for new capacity and energy management

The State of the Electricity System
South Africa’s power system is constrained and will be for next few years

Eskom, together with stakeholders, have kept the lights on since 2008

Most power stations are in their mid-life and require increased maintenance

Strategy of shifting maintenance outages can no longer be sustained.

Significant maintenance is required to address backlogs

Initiatives are in place to keep the lights on
Ensuring stable system operation

Ideally, 3,000MW of committed capacity from supply and demand initiatives is needed immediately to keep the lights on and enable maintenance to continue. Reducing this target will require an adjustment to the maintenance programme.

Between now and end-December 2013, the minimum targets set out in the table below need to be achieved to prevent an emergency.

<table>
<thead>
<tr>
<th>High load factor initiatives to bring certainty to maintenance planning</th>
<th>Immediate (MW)</th>
<th>By July 2012 (MW) and sustained to end December 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-Emergency/Contingency/Peaking initiatives</td>
<td>1000</td>
<td>2000</td>
</tr>
<tr>
<td></td>
<td>2000</td>
<td>1000</td>
</tr>
</tbody>
</table>
Historical Performance
NERSA MYPD2 allocation for EE and DSM

5.4 billion ZAR, over 3 years, to deliver 1 037 MW demand savings and 4 055 GWh energy savings.

Electricity consumer money is ploughed back into the economy via energy efficiency rebate programmes.
Eskom has consistently over-achieved on the NERSA targets

* Includes DMP & Non Funded Projects
Eskom’s demand savings performance to date

Demand Savings
3073 MW

1 power station generator is approximately 600MW therefore over 5 generators “freed up”
The IDM energy savings for 2011/12 could power a city for a year

1,422 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
Achieving 343 MWs with various technologies

<table>
<thead>
<tr>
<th>Technology Type</th>
<th>Number of Units</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>LED downlights in commercial facilities</strong></td>
<td>17 150 000</td>
</tr>
<tr>
<td>based on data from current pilot</td>
<td></td>
</tr>
<tr>
<td><strong>Heat pumps for residential use</strong></td>
<td>989 924</td>
</tr>
<tr>
<td>based on empirical values used in planning</td>
<td></td>
</tr>
<tr>
<td><strong>Solar Water Heater</strong></td>
<td></td>
</tr>
<tr>
<td>with timer based on M&amp;V data</td>
<td></td>
</tr>
<tr>
<td><strong>High pressure systems</strong></td>
<td>631 605</td>
</tr>
<tr>
<td><strong>Low pressure systems</strong></td>
<td>3 040 559</td>
</tr>
<tr>
<td><strong>Commercial efficiency upgrades</strong></td>
<td>435</td>
</tr>
<tr>
<td>average based on 110 competed projects</td>
<td></td>
</tr>
<tr>
<td><strong>Industrial efficiency improvement projects</strong></td>
<td>246</td>
</tr>
<tr>
<td>average based on 72 completed projects</td>
<td></td>
</tr>
</tbody>
</table>
IDM programmes require large scale support and logistics needs.
Eskom compares favourably with the rest of the world

54 million CFLs distributed across South Africa to date, representing one of the largest CFL roll outs in the world.

Recognised by the World Bank as one of the most comprehensive utility energy efficiency and demand side management programmes, certainly amongst the BRICS countries.

Amongst the lowest cost programmes in the world as measured by $/MW demand reduction.

Eskom’s innovative Power Alert tool has won prestigious international awards in both marketing and engineering fields.

Aligned with best practices for energy efficiency implementation programmes as developed by the EU Energy Efficiency Watch survey of the National Energy Efficiency Action Plans from 26 EU Member States.
Market Focus
Electricity consumption per sector

Eskom prioritises its focus on energy efficiency by targeting all economic sectors with multiple technologies.
IDM activities previously focused primarily on three areas

<table>
<thead>
<tr>
<th>Area</th>
<th>Projects</th>
<th>Megawatts</th>
<th>Gigawatt-hours/annum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industrial and mining process optimisation &amp;</td>
<td>164</td>
<td>527</td>
<td>1,440</td>
</tr>
<tr>
<td>efficiency upgrades</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mass rollouts (mainly of CFLs)</td>
<td>48</td>
<td>2,006</td>
<td>6,667</td>
</tr>
<tr>
<td>Solar Water Heaters (high and low pressure systems)</td>
<td>38,731</td>
<td>84,677</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>60</td>
</tr>
</tbody>
</table>
Industrial and Commercial Sectors
Typical energy savings projects undertaken

Total Mining sector Savings = 287MW @ R613 million

Pumping Demand Savings = 143MW Eg. Union Mine

Compressor Management
Demand Savings = 76MW
Eg. Cooke Mine

Fridge Plants
Demand Savings = 35MW
Eg. Harmony Mine

Winders & VSD & Other
Demand Savings = 34MW
Eg. Bambanani Mine
Residential Sector

Eskom follows a structured approach to achieve savings in the residential sector

**Market segment 1**
(~21% of households)

- **LSM 1 – 3**
  (number of appliances)
  - Lighting: 6.8 m
  - Television: 1.8 m
  - Refrigerator: 0.2 m
  - Air Conditioner: 0.9 m
  - Fan: 3.2 m

**Preferred approach:** Mass, door-to-door rollout of a limited, standard technology offer

**Predominantly lighting opportunity and current (free issue) SWH programme**

**Market segment 2**
(~58% of households)

- **LSM 4 - 7**
  (number of appliances)
  - Lighting: 54.1 m
  - Television: 10.7 m
  - Refrigerator: 4.1 m
  - Air Conditioner: 0.09 m
  - Fan: 6.5 m

**Preferred approach:** Installer type model with a standard package of technologies

**Extensive lighting plus more diverse range of technologies.**

**Demand management opportunity via timers (or similar)**

**Market segment 3**
(~21% of households)

- **LSM 8 – 10**
  (number of appliances)
  - Lighting: 44.4 m
  - Television: 5.5 m
  - Refrigerator: 3.2 m
  - Air Conditioner: 0.8 m
  - Fan: 5.0 m

**Preferred approach:** Retailer model offering discounted products (plus installation offer)

**Significant opportunity for energy and demand savings impact BUT a standard, free issue solution is less suitable**

(Source: Frost and Sullivan Market Analysis for Residential market 2012)
Eskom has installed over 285,000 Solar water heating systems and 52 million CFLs.
Eskom supports the retrofitting of old inefficient technologies.
DSM involves public awareness and drive to instil cultural change to energy efficiency
Skills Development and Localization

Eskom through its programmes supports skills development and localisation
Industry Development

Eskom supports industry development through training and industry workgroups.
Funding Options and Technologies
# IDM activities previously focused primarily on three areas

<table>
<thead>
<tr>
<th>Area</th>
<th>Projects</th>
<th>Megawatts</th>
<th>Gigawatthours/annum</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industrial and mining process optimisation &amp; efficiency upgrades</td>
<td>199</td>
<td>596</td>
<td>1,831</td>
<td></td>
</tr>
<tr>
<td>Mass rollouts (mainly of CFLs)</td>
<td>318</td>
<td>2,128</td>
<td>4,735</td>
<td>52 m CFLs rolled out 2004-2011</td>
</tr>
<tr>
<td>Solar Water Heaters (high and low pressure systems)</td>
<td>36,808</td>
<td>151,028</td>
<td>33</td>
<td>219</td>
</tr>
</tbody>
</table>

*2012/05/12*
IDM Funding Programmes

- **New suite of funding mechanism products launched.** This has been widely accepted by the market reflected in:
  - Significant increase in uptake of standard offer and Standard product solutions
  - Good indication that solution correctly developed for target market
- **Small scale demand side renewables** pilot included under Standard Offer programme
  - First PV project already approved in the Western Cape

![Standard Offer uptake chart]

![Standard Product uptake chart]
Industry Development

**ESCo activity**

- Stimulation of Energy Services Companies (ESCo’s) (300% increase over last 2 years)
  - IDM developed commercial levers to stimulate industry
  - Streamlined technology and funding approvals
  - Reduced barriers to entry for smaller upcoming enterprises
  - Support of new enterprises with training
Lead by example

- As a custodian of energy, Eskom is at the forefront of energy efficiency
  - Over achievement of annual targets
  - Retrofits have been completed at 111 facilities
  - Technologies retrofitted include lighting, HVAC, Renewables, Water heating pumps, Solar water heating systems
- PV projects with total output if 3.5GWh completed at Kendal and Lethabo Powerstations as well as Megawatt Park
- Focus on staff home and office energy efficiency education
  - Savings and load management tips
  - Promoting adoption of technologies

<table>
<thead>
<tr>
<th>Year</th>
<th>Target (GWh)</th>
<th>Achievement (GWh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010/11</td>
<td>24</td>
<td>26.2</td>
</tr>
<tr>
<td>2011/12</td>
<td>25.5</td>
<td>44.9</td>
</tr>
<tr>
<td>2012/13 (6 mth)</td>
<td>20</td>
<td>11.5</td>
</tr>
</tbody>
</table>
In conclusion....
In conclusion

• **Eskom sees Energy Efficiency and Demand side management** as a **very strong vehicle** for Security of Supply

• **Continuity** of the current Eskom rebate programmes **is essential** to sustain the momentum of the current energy efficiency drive in the South Africa

• Eskom has applied to NERSA for additional funds to realise **2,557MW** of demand savings in the next 6 years

• **Any significant changes** to the current governance and funding of energy efficiency projects **will create undue risk** to the security of supply in the current constrained electricity system
• Thank You