Customer Network Business

Customer network business 168
System operations and planning division 173
  Mandate 173
  Benchmarking 173
  Material issues 173
Status of the power supply system in south africa 173
  Medium-term outlook 173
  Ten-year transmission development plan 174
  Facilitating the entry of IPPs 175
  System resilience building 175
  Current performance 175
Transmission division 176
  Mandate 176
  Benchmarking 177
  Material issues 177
  Maintenance and refurbishment 177
  Environmental impact assessments and land acquisitions 178
  Expropriation 178
  Strategic environmental assessment 178
  Copper and pylon theft 179
  Contracting with SADC utilities 179
  Current performance 180
  Transmission system performance 180
  Environmental performance 180
  Environmental expenditure 181
  Key customer update 181
Distribution division 182
  Mandate 182
  Benchmarking 183
  Material issues 183
  Distribution capital planning 183
  Customer service 183
  Tariffs 184
  Free basic electricity 185
  Management of total energy losses 185
  Operation Khanyisa 186
  Free basic electricity 187
  Electrification 187
  Customer debt 188
  Current performance 189
  Distribution system performance 189
  Customer service index 190
  Environmental and safety performance 190
Integrated demand management division 191
  Mandate 191
  Overview 191
  Benchmarking 192
  Material issues 192
  Demand market participation 192
  Energy conservation scheme 192
  Efficient lighting 192
  Solar water heating 192
  Energy efficiency marketing and communications 193
  Current performance 193
Customer Network Business

Mandate

Accountable for the network and customer services business in Eskom. This entails the planning, operations and maintenance of the transmission and distribution network, the management of the customer base, long-term electricity capacity planning and the revenue stream.

<table>
<thead>
<tr>
<th>Highlights</th>
<th>Challenges</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Provided an incident-free electricity supply for the 2010 FIFA World Cup™</td>
<td>• Very high levels of theft of equipment and electricity, which are</td>
</tr>
<tr>
<td>• Increased the uptake of solar water heater rebates offered by Eskom</td>
<td>affecting plant performance and increasing cost</td>
</tr>
<tr>
<td>• Launched Operation Khanyisa as part of the energy loss and theft</td>
<td>• The deaths by accident of three Distribution employees and</td>
</tr>
<tr>
<td>management programme</td>
<td>seven contract workers, as well as three contract workers from</td>
</tr>
<tr>
<td>• Exceeded the target for schools connections</td>
<td>Transmission</td>
</tr>
<tr>
<td>• Lost significantly less energy than targeted: the 2.63th system minutes</td>
<td>• R123 million overdue municipal debt payments at year-end</td>
</tr>
<tr>
<td>lost against a target of 3.4 and a three-year historical average of 3.8</td>
<td>• Non-payment by large and residential customers, and some lengthy</td>
</tr>
<tr>
<td>is exceptional</td>
<td>contractual payment disputes</td>
</tr>
<tr>
<td>• There were no major interruptionsa (this performance level was last</td>
<td>• Employee security is becoming a concern</td>
</tr>
<tr>
<td>achieved in 2004/05)</td>
<td>• Not meeting the target of 158 430 overall electrification connections</td>
</tr>
<tr>
<td>• Made demand-side management savings of 354,1MW against an Eskom target</td>
<td>this year (149 914 made)</td>
</tr>
<tr>
<td>of 301MW</td>
<td>• Collisions and electrocutions of birds on distribution power lines</td>
</tr>
<tr>
<td></td>
<td>• Acquisition of land and rights for electricity infrastructure</td>
</tr>
</tbody>
</table>
Future priorities

- Facilitate the participation of independent power producers at local and regional levels
- Facilitate vibrant energy trade in sub-Saharan Africa
- Intensify demand management and the regional inflow of green power
- Manage internal electricity usage across Eskom
- Integrate energy and power delivery planning into Eskom’s strategic planning
- Acquire and retain the right skills
- Improve asset management
- Make step changes in safety and security
- Institute integrated demand management across all Eskom divisions

- Support government initiatives such as the universal access plan and solar water heating
- Contribute to socioeconomic development by:
  - Reducing public safety incidents through awareness
  - Achieving demonstrated climate change deliverables
  - Providing viable electricity options to informal settlements
  - Contributing to broad-based black economic empowerment and small business development

R millions

Financial results

<table>
<thead>
<tr>
<th></th>
<th>Transmission and Systems Operations and Planning</th>
<th>Distribution and Integrated Demand Management</th>
<th>Total Customer Network Business</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total revenue</td>
<td>42 390</td>
<td>55 137</td>
<td>97 527</td>
</tr>
<tr>
<td>Profit for the year</td>
<td>146</td>
<td>1 875</td>
<td>2 021</td>
</tr>
<tr>
<td>Total assets</td>
<td>40 863</td>
<td>51 535</td>
<td>92 398</td>
</tr>
<tr>
<td>Capital expenditure (including capitalised interest)</td>
<td>6 485</td>
<td>8 474</td>
<td>14 959</td>
</tr>
<tr>
<td>2010</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total revenue</td>
<td>29 492</td>
<td>43 577</td>
<td>73 069</td>
</tr>
<tr>
<td>Profit for the year</td>
<td>2 080</td>
<td>290</td>
<td>2 370</td>
</tr>
<tr>
<td>Total assets</td>
<td>28 438</td>
<td>43 995</td>
<td>72 433</td>
</tr>
<tr>
<td>Capital expenditure (including capitalised interest)</td>
<td>7 143</td>
<td>7 079</td>
<td>14 222</td>
</tr>
</tbody>
</table>

Debtors days

<table>
<thead>
<tr>
<th>Measure</th>
<th>Measure</th>
<th>2011</th>
<th>2010</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average debtor days: Distribution</td>
<td>Days</td>
<td>22.2</td>
<td>22.0</td>
<td>20.8</td>
</tr>
<tr>
<td>Average debtor days: Transmission</td>
<td>Days</td>
<td>16.0</td>
<td>16.1</td>
<td>18.1</td>
</tr>
</tbody>
</table>

Overview

Customer Network Business (CNB), which has been functioning for three years, comprises Distribution, Transmission, System Operations and Planning and Integrated Demand Management with the mandate to ensure that power system risk can be managed in an integrated manner. The focus of the division is to align resources, delivery processes and operational and planning strategies across the company in a consistent and coherent manner. This approach resulted in working across divisional boundaries to ensure that the challenges of managing aged networks, a tight power system, and providing customer services were managed within a coherent risk management framework, building resilience whenever a learning opportunity arose.

Customer Network Business plays a key role in delivering on the shareholder expectations of ensuring a reliable supply of electricity to all South Africans, ensuring adequate future electricity for South Africa, supporting the developmental objectives of South Africa and significantly contributing to the sustainability of Eskom.

Key performance measures in this regard include the licence to operate, financial sustainability, regaining confidence, keeping the lights on, talent management, customer centricity, Eskom strategy and included an incident free electricity supply for the 2010 FIFA World Cup™.

The maintenance and refurbishment of existing plant and network expansion, through new infrastructure, ensures optimal electricity delivery to Eskom’s approximately 4.6 million customers.

Transmission and Distribution network infrastructure as at 31 March 2011

- 395 419km of power lines (2010: 390 338km)
- 351 297 transformers (2010: 344 369)
- 232 058MVA transformer capacity (2010: 223 398MVA)
The divisional structure was enhanced during the year to accommodate the integrated demand management project that was initiated in 2009. This approach completed the strategy to manage the tight capacity situation by adding an additional focus area in the ever challenging supply/demand balance management process. Integrated demand management provides customer solutions to reduce the demand for electricity through increased energy efficiency.

Technical system performance
Transmission, Distribution and System Operations & Planning have worked tirelessly to maintain top quartile performance in areas where this has already been achieved. They have also worked very hard on those areas aspiring for appropriate benchmark performance. An aged network such as Eskom’s makes this aspiration a difficult challenge.

South Africa’s electricity system continues to be under pressure. There is a low reserve margin, which results in shorter windows of opportunity to perform essential maintenance on power stations, as well as less opportunity to schedule the major refurbishments required by the older power stations (refer page 152 in Generation). However, the system has performed well over the past year, and there has been no load shedding since January 2008. The supply/demand margin will remain slim for the next 5 – 6 years, in particular the next two years. Customer Network Business manages this dynamic and complex system in real time, continuously analysing power system risks as they appear in key subsystems and interact with each other, mitigating the effects.

Thirty Transmission interruptions were recorded in 2011 (2010: 31) against a target of 35. There were no major incidents (more severe interruptions) (2010: 1 incident). This is a substantial improvement, although the risk on the network of such incidents has not fundamentally been reduced.

The Transmission total system minutes lost (for incidents of less than one system minute) has also performed above expectation – 2.63 RA against a target of 3.40 (2010: 4.09 RA against a target of 3.40). This was the result of continued intense focus on asset management and operations within the Transmission division.

Distribution’s system average interruption duration index (SAIDI) actual performance is 52.61 RA, a slight improvement on the 2010 figure of 54.41 RA, but disappointing against the 2011 target of 49.50. The system average interruption frequency index (SAIFI) for 2011 is 25.31 RA against a target of 23.20 (2010: 24.65 RA). Performance against these two indices is a concern, and is largely due to the long restoration times in mainly rural areas, where technical staff cover long distances to repair faults.

System resilience building
A system resilience building programme has been initiated to enhance the division’s ability to identify, anticipate, and adapt rapidly to threats and vulnerabilities arising from changes in the internal and external environment, to operate at elevated levels of stress without failure for extended periods of time, to respond to a shock by containing the impact (severity/duration) of the event, to recover quickly in a co-ordinated manner, and implement learning from near misses and recovery experiences.

System adequacy and integrated resource planning
The system adequacy and integrated resource planning processes ensure that network and energy adequacy plans are established.

Liveline maintenance work reduces downtime on networks.

RA – Reasonable Assurance provided by the independent assurance provider (refer page 200).
The Department of Energy is accountable for government’s recently approved Integrated Resource Plan (IRP 2010), which incorporates South Africa’s energy plan and the related electricity generation capacity plan. Customer Network Business has supported the department by making key modelling skills and energy information available. IRP 2010 was approved by Government during March 2011.

In terms of licence requirements, Transmission publishes an annual document detailing how the transmission network will be developed over 10 years. A requirement is that public forum(s) are held to share such plans with stakeholders in order to facilitate a joint planning process. A public forum was held on 5 April 2011 (see page 18 for more details).

The total capital expenditure on the Transmission grid for 2011 was R6.5 billion (2010: R7.1 billion), of which refurbishment constituted R657 million (2010: R605 million). The capital expenditure projections for the coming three years amount to R46.2 billion. This is largely made up of projects relating to power station integration and corridor strengthening in the KwaZulu-Natal, Cape and North East areas.

The Distribution Capital Plan, prepared on an annual basis, presents a five-year window. As part of the response strategy to the poor SAIDI performance, Distribution is changing the planning approach and criteria. The total capital expenditure on the Distribution grid for 2011 was R8.5 billion (2010: R7.1 billion), of which refurbishment constituted R1.2 billion (2010: R900 million). The capital expenditure projections for the coming three years amount to R34.9 billion.

At present there are about 800 to 1 000 constrained feeders in Distribution which means that due to either voltage or transformer capacity limitations, no new connections can be made. Most of these constraints can only be removed by means of sub-transmission infrastructure strengthening. The amount of capital required and not spent was around R5 billion in 2011, which indicates the extent of the backlog. The amount that can be implemented is in the order of R3 billion. It is hoped to remove the backlog by 2014/15.

The 10-year electrification programme does not cater for the government plan of universal access by 2014. There is a backlog of 3.4 million households at an estimated cost of R32 billion (2007 estimate). The 10-year plan aims to spend R29 billion over the period and deliver about 2.6 million connections. The total programme of 3.4 million connections can be completed in 2021/2022 for an estimated R36 billion (2009 estimate). Even this timetable implies that over 500 000 connections will have to be done in 2020, which is ambitious. If this programme has to be expedited, it will severely limit the ability to execute the spend in other categories and increase the operational expenditure due to increased connection numbers. Eskom is currently reviewing options to accelerate this programme.

**People and skills**

Even though there is a tight capacity situation, Eskom staff have shown intense commitment to keep the lights on. The low attrition levels are indicative that employees are committed to be part of the organisation even through these tough times.

Skills development, as part of our shareholder compact, continued to be a focus as one of the roles in the contribution to the country’s socioeconomic drive. The total number of learners within CNB for the financial year was approximately 2 057. This complement constituted learners at FET colleges, university and university of technology bursars. The skills areas ranged from technical to business-related skills. CNB continued with its training programmes in all areas of its business; but the ability to meet the ever growing skills shortages in specifically field operations remains a challenge. A recent study by the Electric Power Research Institute (EPRI) has commended CNB for its senior skills capability that it refers to as “pillars of strength”.

**Safety, health, environment and quality**

Distribution’s greatest success has been the achievement of 340 days without an employee fatality, which is a first in the history of Distribution. This was substantially overshadowed by three Distribution employee fatalities, seven contractor fatalities and 43 public fatalities.

Transmission had no employee fatalities during the year; however, contractor and public safety remain a concern with three contractor fatalities and one public fatality.

The System Operations & Planning division is progressing well towards their ISO 9001 certification with the stage 1 certification audit successfully passed in March 2011 at the first attempt. The Distribution ISO 9001 programme to achieve certification has commenced. While Transmission remains ISO 9001 compliant, they have not maintained their ISO 9001 certification for the first time in over four years.

**Energy loss management**

One of the key challenges that exacerbates the supply/demand balance and threatens Eskom’s revenue security is that of energy loss through theft. In this regard, Eskom has launched Operation Khanyisa to make a strategic shift in addressing this challenge.

For the financial year, the overall energy losses were 8.25% against a budget of 8.75% (2010: 8.45% against a budget of 8.76%). The total energy losses for the Distribution network and Transmission network were 5.68% and 3.27% (2010: 5.87% and 3.27%, respectively). This Distribution figure compares favourably with the international benchmark.

Theft of cables and transmission tower components and other equipment continues to be a challenge. Municipalities are experiencing a similar challenge, which points to the need for a country-wide security initiative to reverse the current trends. Non-technical losses are estimated to be between 1.4% and 2.3% (2010: 1.5% and 2.4%) of Distribution energy losses.
Customer Network Business continued

Revenue management
The management of large power user debt is under control, except for municipal arrear debt. The risk of defaulting metropolitan municipalities is increasing and may result in cash flow implications for Eskom. There is a prolonged arbitration process to deal with these issues.

The major challenge for small power user debt is in the Soweto area where current debt management strategies are only achieving limited success. There is a need for an elevated and co-ordinated strategy for Soweto. CNB remains confident that the current strategies being followed by Distribution should further improve the current and emerging debt issues being experienced.

Inclining block tariff
In February 2010, the National Energy Regulator of South Africa (NERSA) introduced an inclining block tariff (IBT) to the electricity consumers in South Africa. IBT is a tariff that sets electricity prices in blocks where the rates increase as usage increases. The IBT structure gives significant relief to low consumption customers, who make up the majority of residential customers. These low consumption customers are seeing reductions in their monthly bill, while higher consumption customers, using more than 1 500kWh per month, have higher than the average increases. IBT was fully implemented for residential metered customers, but, due to technical challenges regarding Eskom’s 3.9 million prepaid residential customers, the roll-out of IBT to these customers was implemented on 1 April 2011.

Customer service levels
Key Sales and Customer Services (KSACS) customers are largely serviced through customer executives allocated per region. During the past financial year numerous interactions have taken place, in the form of customer visits, workshops, and forums. Customer interventions vary from small meetings to large key customer forums. These strong key industrial customer relationships must continue and need to permeate other customer segments to realign Eskom’s drive for customer centricity. For this financial year, the KSACS customer service level was 101% against a target of 100% compared to 103% against a target of 103% in 2010. The strategies that were implemented in 2010 have proven to be effective.

Distribution customers are serviced through customer centres, walk-in centres, customer executives, and electronic channels such as internet and SMS. Customer service in the Distribution environment is measured through the customer service index and, for this financial year, the score was 84.37% against a target of 83.71% (2010: 85.05% against a target of 82.65%).

One of the key focuses for CNB going forward, includes a new Customer Services Division to focus on customer services, to continuously improve the customer services performance and to improve the customer experience.

Stakeholder engagement
The key customer section ensures regular and meaningful interactions with key stakeholders. These interactions allow for meaningful engagement and dialogue on various topics and assess the impact of Eskom’s decisions on key customers’ businesses. Customer interventions can vary from small meetings to large key customer forums. See section in Transmission on page 181 for detail.

Future focus areas
Overcoming the energy gap over the next two years requires the support of all stakeholders to ensure that the lights stay on. In this context, the Eskom build programme, the signing up of IPPs nationally and, in the region, focus on demand management and careful day-to-day management of the power system is critical. Skills and talent development must continue and Eskom needs to continue to attract and retain the best people for its operations.

CNB, over its three-year existence, has created the opportunity to build tighter relationships for the wires, customer service, demand management and system operations functions within Eskom. This process has resulted in firmer leadership interaction, which is vital, especially in an era of aged infrastructure and a supply/demand imbalance. This achievement has contributed significantly to the achievement of the division’s mandate. The interaction has created extensive opportunities for the highly talented people in the wires, retail and operations portfolios for divisional cross-learning and created many deep and important improvements for Eskom.
System Operations and Planning division

Mandate

Provide an integrative function for the reliable development, operation and risk management of the interconnected power system.

<table>
<thead>
<tr>
<th>Highlights</th>
<th>Future priorities</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Signed power purchase agreements for 373MW with five independent</td>
<td>• Create a wide enough maintenance window for the</td>
</tr>
<tr>
<td>power producers</td>
<td>generation fleet to pro-actively ensure future</td>
</tr>
<tr>
<td>• Produced and disseminated quarterly “state of the system” updates for</td>
<td>generation performance</td>
</tr>
<tr>
<td>stakeholders</td>
<td>• Set up governance structures for the single buyer</td>
</tr>
<tr>
<td>• Put in place formal processes that are more sophisticated and robust to</td>
<td>office that are independent from Eskom</td>
</tr>
<tr>
<td>identify areas of vulnerability and track progress on the risk treatment</td>
<td></td>
</tr>
<tr>
<td>plan on a quarterly basis</td>
<td></td>
</tr>
</tbody>
</table>

Benchmarking

System Operations and Planning participates in the International Comparison for Transmission System Operators, an international group of about 20 transmission system operators. System Operations and Planning has also recently joined the Very Large Power Grid Operators (VLPGO) group, comprising the largest transmission grid and system operators in the world. The division achieved top quartile performance, but resources are higher than the average system operator.

Material issues

Status of the power supply system in South Africa

Electricity demand levels were close to 2009/10 levels in 2010/11. Eskom will rely on energy-efficiency measures, as the supply-demand balance will remain tight beyond winter 2011 until new power stations come online.

While the peak demand during the winter of 2010 was 36 664MW, the current forecast peak for winter 2011 is 37 553MW.

Medium-term outlook

Based on current assumptions, South Africa’s energy gap will peak in 2012, when demand will exceed supply by 9TWh, equivalent to about 1 000MW of baseload capacity. The projected gap will only go down to zero in 2016, and the reduction depends strongly on Eskom’s build programme, the Department of Energy’s independent power producers project, the renewable energy process, and the roll-out of the funded demand-side management programme.

System Operations and Planning executes and facilitates solutions to maintain the power system with minimal disruptions, taking into account real constraints. The focus is on balancing supply and demand.
and the availability of delivery networks with long-term asset health and sustainability. The current challenge includes creating a wide enough maintenance window for the generation fleet to pro-actively assure future performance.

Key objectives

- Ensure that supply-side initiatives are implemented by improving existing generation fleet performance by 2% in three years; complete planned new build capacity on time or earlier; upgrade the capacity of some existing units; procure 1 025MW renewable generation in the next three years; and increase available capacity by contracting municipal power stations and independent power producers (including renewable and co-generation), including finalising a framework for the relationship between Eskom and the independent power producers for their generators
- Reduce demand by accelerating the demand-side management programmes to install energy-efficient technologies and drive behavioural change; continue to implement the demand market participation programme and the demand response pilot programme; ensure that Eskom’s own internal energy efficiency programme is delivered on
- Establish a safety net for the residual demand gap through additional demand response initiatives, an energy conservation scheme, and the ability to use the open-cycle gas turbines if required
- Pursue partnerships with private and public partners to implement the medium-term risk mitigation project
- Secure the national power system by implementing and enhancing the national code of practice for emergency load reduction.

A further requirement is that public forums are held with stakeholders to facilitate a joint planning process. The transmission development plan that covers the years 2011 to 2020 was published in 2010/11.

See www.eskom.co.za/annreport11/008.html for further details.

New assets

Over 6 000km of 765kV and 8 000km of 400kV new transmission lines have been approved or proposed over the 10-year transmission development plan period. Major network reinforcements are required for the supply to the Western Cape (South and West grids) and KwaZulu-Natal (East grid). The large volume of 400kV transmission lines are part of the more meshed transmission network being developed to improve reliability and network security. The integration of new power stations into the developing Limpopo West power pool (Medupi and Coal 3 close to Matimba) also requires significant lengths of transmission line as they are very remote from the main load centres. Some 1 700km of new 800kV high-voltage direct current lines are required for exporting excess power from Coal 3 directly to load centres in Gauteng and KwaZulu-Natal (Central and East grids).

The addition of over 72 000MVA of transformer capacity is an indication of both the increasing load demand and the increasing capacity requirements of customers.

About 2 800MVars of capacitive support is required for areas of the network under contingency conditions to ensure that the required voltage levels are maintained. They also improve system efficiency by reducing network losses.

Ten-year transmission development plan (TDP)

Eskom’s transmission licence requires the annual publication of a document detailing how the transmission network will develop in the next five years.

The details that are required of how the transmission network will develop in the next five years are:

- A description of the acquisition of servitudes for strategic purposes
- A list of planned investments, including costs
- Diagrams of the planned changes to the transmission system
- An indication of the impact on customers
- Any other information as specified by the National Energy Regulator of South Africa from time to time.

High-voltage lines near Johannesburg.
From a grid code perspective, the current transmission system is not fully compliant with the reliability criteria as stipulated in the South African grid code and a substantial number of projects in the TDP are required for this purpose.

It is Eskom’s intent that the transmission system should attain compliance in terms of the reliability criteria by 2018.

**System resilience building**

Elements of improved system resilience:
- React to threats and vulnerabilities from changes in the internal and external environment
- Operate at elevated levels of stress without failure for extended periods of time
- Respond to a shock by containing the impact (severity and duration) of the event
- Recover quickly in a co-ordinated manner
- Implement learning from near-misses and recovery experiences.

Various internal and external exercises were run before the 2010 FIFA World Cup™ and in early 2011 to test the resilience structures in Eskom and South Africa. Formal codes of practice have been developed and published. Formal processes to identify areas of vulnerability and track progress on risk treatment plans on a quarterly basis have been put in place and are improving in sophistication and robustness.

**Facilitating the entry of IPPs**

Eskom is committed to facilitating the entry of independent power producers in collaboration with government, the National Energy Regulator of South Africa and project developers. Eskom has already signed agreements with independent power producers and will continue to do so within the framework of the integrated resource plan and the multi-year pricing determination.

Government is preparing the commercial documentation to procure renewable energy through the renewable energy feed-in tariff programme (REFIT), for release in the near future. Eskom is assisting government in this process and will be the buyer of this energy.

To fulfil the ambition that independent power producers account for 30% of South Africa’s generation capacity in the next 20 years requires a different approach to providing network access to independent generators. Eskom is preparing for this complex new business, and will provide a grid access framework to manage future independent power producer connections to the Eskom networks.

The grid access framework will be managed by a new unit (the grid access unit set up in the new Customer Services division) that will ensure efficient internal operational processes for independent power producers. Eskom’s existing single buyer office will continue in its role of facilitating the signing of power purchase agreements with IPPs. The single buyer office has been ringfenced in a separate organisational unit to accommodate concerns that Eskom may have conflicts of interest in procuring from IPPs, provide transparency, and include external parties in the procurement processes.

**Current performance**

**Statistical information**

<table>
<thead>
<tr>
<th></th>
<th>2011</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peak demand on integrated system excluding load reductions</td>
<td>36 664MW</td>
<td>35 850MW</td>
</tr>
<tr>
<td>Peak demand on integrated system including load reductions</td>
<td>36 970MW</td>
<td>35 912MW</td>
</tr>
</tbody>
</table>

National control centre in Simmerpan, Johannesburg.
Customer Network Business continued
Transmission division

Mandate
Operate and maintain the lifecycle of the South African Transmission network, while managing key customer relationships and trading energy internationally.

The Transmission network consists of 28,790km of transmission lines of voltages ranging between 132 to 765kV and a network of 160 substations.

<table>
<thead>
<tr>
<th>Highlights</th>
<th>Challenges</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Had no cases of non-compliance with environmental legislation, attributable to the controls and oversight mechanisms implemented in all Transmission business units</td>
<td>• Losses of almost R3 million due to conductor theft and more than R5 million due to the theft of steel tower members (pylon theft)</td>
</tr>
<tr>
<td>• Developed and implemented biodiversity and land environmental management plans for 330 existing power lines based on a phase-in approach: The proposed target for 2011 was 100%, and this was achieved (2010: 95%)</td>
<td>• The number of line faults, mainly due to an increase in the number of fire and bird-related faults, and lightning following increased rainfall this season</td>
</tr>
<tr>
<td>• Conformed with ISO 14001 in all Transmission business units’ environmental systems</td>
<td>• Non-payment by key customers, including a large customer liquidation case, and some contractual payment disputes experiencing lengthy resolution delays</td>
</tr>
<tr>
<td>• Substantially improved the number of system minutes lost – system minutes &lt;1 at 2.63/min is exceptional against a target of 3.4 and a three-year historical average of 3.8.</td>
<td>• Employee security is becoming a concern.</td>
</tr>
<tr>
<td>• Experienced no major interruptions</td>
<td></td>
</tr>
<tr>
<td>• The Eskom KeyCare Total Quality Index for the year ending March 2011 was 101% against a target of 100%</td>
<td></td>
</tr>
<tr>
<td>• Successfully renegotiated one of the remaining two special price agreements.</td>
<td></td>
</tr>
</tbody>
</table>

Future priorities

• Strengthen and maintain the network
• Continue efforts to reduce conductor and pylon theft
• Improve asset management
• Ensure continuous improvement in the effective implementation of conditions of environmental authorisations, including environmental management plans
• Continue negotiations on the remaining special price agreement.
Benchmarking

Transmission participated in the International Transmission Operations and Maintenance Study, which is primarily focused on maintenance and plant performance, with 27 international transmission companies. Maintenance performance was compared and best practices for the transmission industry worldwide were set. Eskom’s transmission asset failure rates are in the first quartile for extra-high voltage switchgear and instrument transformers. Its performance is below average in the overhead line and compensation equipment failure rates.

A study conducted by an independent international consulting group to establish first quartile transmission performance based on European utilities provided the following conclusions:

• Average number of interruptions (per 10 000km of line) is eight and Eskom scored 11.
• Average duration of interruptions is 87 minutes and Eskom achieved 69 minutes.
• Total Eskom Transmission costs are low relative to other utilities.

Benchmarking Eskom’s Transmission system performance against other similar utilities is challenging due to differences in network firmness and reliability criteria, definitions and data capturing practices between utilities.

Material issues

Maintenance and refurbishment

Maintenance of transmission plant is informed by lifecycle management plans through to end of plant life.

Major asset classes on which maintenance is performed:

• Transformers
• Transmission lines
• Shunt capacitor banks
• Reactors
• Series capacitor banks
• Static var compensators
• Circuit breakers.

Some 60% of Eskom’s transformers and 54% of its power lines are older than 25 years, as are 50% of the circuit breakers in the voltage range 220kV – 765kV. This demands high-level plant and equipment maintenance and continual refurbishment of plant that has reached the end of its useful life.

See www.eskom.co.za/annreport11/009.html for further detail
Customer Network Business continued
Transmission division continued

Environmental impact assessments and land acquisitions

Acquiring land, land rights and environmental authorisation to build electricity infrastructure, particularly transmission lines, is a major challenge for the new build programme. Most delays and cost overruns are related to these activities. There have, however, been significant improvements as a result of various initiatives in previous years.

Key initiatives for securing environmental authorisations and land rights
- Capital expansion stakeholder forums in regions where Eskom has major projects, such as Lephalale
- Strategic environmental assessments
- Enhanced public participation processes
- Annual communication of strategic plans to major stakeholders.

The implementation of Eskom’s recently approved environmental impact assessment and land rights strategy will ensure that the related processes are executed effectively.

Positive trends in environmental impact assessments and land acquisition

With the active participation of affected and interested parties and stakeholders, objections to Eskom projects are raised early in the environmental impact assessment process, allowing the environmental team to deal with these issues before the environmental impact report is submitted to the Department of Environmental Affairs for authorisation.

In response to concerns raised by interested and affected parties, Eskom has improved the review process, giving the public enough time to respond. The public uses the time to consult specialist professionals to assist them to make informed contributions. This has benefitted both Eskom and the receiving communities.

There are fewer appeals against environmental authorisations. And where there are appeals, they are normally regarded as not having substance.

The success rate of projects has been encouraging in 2010/11. With the exception of one, all environmental authorisations received were uncontested and for those that were contested, the appeals were dismissed.

Expropriation

During negotiations about servitudes and land, Eskom sometimes reaches a deadlock if it cannot meet the landowner’s demands. When all possible alternatives have been exhausted, expropriation is still the only tool to resolve such an impasse.

This is not the best approach as it:
- Affects the long-term relationship between Eskom and the landowner
- Normally affects project delivery times because it is a long process
- Leaves little room for negotiation, as the decision is made by the State.

The current expropriation process requires Eskom as the applicant to consult with the public and the affected landowners before an application can be lodged with the Department of Public Works. Data indicates that expropriation applications lodged with the National Energy Regulator of South Africa and the Department of Energy take not less than two years to be completed. The longest application process so far is four years. Transmission has embarked on a process with the newly delegated ministry, the Department of Public Works, to improve the turnaround time.

Due to difficulty in acquiring servitudes for certain projects, Eskom has initiated the process of expropriating eight servitudes in 2010. The intention to expropriate these servitudes was communicated with the affected landowners and they were given an opportunity to raise their comments, concerns and objections where necessary. Despite all these processes, the expropriation still has to be finalised for Eskom to have access to the required servitude in time for construction.

Strategic environmental assessment (SEA)

A strategic environmental assessment is a process to assess the environmental implications of a proposed strategic decision, policy, plan and programme, piece of legislation or major plan. Transmission embarked on such an assessment in June 2010 to guide Eskom grid planners to develop the 20 to 30-year electrical infrastructure expansion plan. The plan addresses the placement of future electrical infrastructure and the recycling of existing infrastructure. Although the plan covers the whole of South Africa, the strategic environmental assessment focuses on a priority study area – parts of the North West, Gauteng, Mpumalanga, Free State and KwaZulu-Natal provinces.
In the year under review the Transmission division suffered losses of R2.9 million due to conductor theft and R5.3 million due to theft of steel tower members (pylon theft).

While these thefts continue to be of concern, there has been a reduction in copper theft losses of as much as 45% compared to 2009/10, attributable to increased physical security and new security technologies at Eskom’s substations.

Pylon theft remains a challenge. There has only been a marginal reduction in losses (3%) compared to last year. Nevertheless, Eskom’s aggressive community engagement campaigns, the increased and new security, and expanded intelligence activities in high-risk areas are beginning to bear fruit.

Eskom is a net exporter of power, where exports from South Africa into the Southern African Development Community region exceed imports from the region.

The Eskom international sales and purchases for the year were 13 296GWh and 10 190GWh, respectively. This excludes both wheeling and “buy-en-route”. International sales for the year were 5.9% of total sales.

The bulk of the imports are from Cahora Bassa (HCB) in north-west Mozambique and small volumes from Lesotho and Zambia.

Eskom exports firm power to the national utilities of Botswana (BPC), Namibia (NamPower), Swaziland (SEC) and Lesotho (LEC). Eskom also has trading relationships with Zimbabwe (ZESA) and Zambia (ZESCO), but these agreements are for non-firm power when there is surplus capacity and during emergency situations. Eskom also exports to three end-use customers, one in Mozambique and two in Namibia. Eskom also wheels (transports) power on behalf of Electricidade de Moçambique (EDM), the national utility of Mozambique, from Cahora Bassa to the load centre in the south of Mozambique and also undertakes other wheeling transactions on behalf of the various utilities. Such wheeling is netted off neutral in exports and imports.
Customer Network Business  continued
Transmission division  continued

The entire Southern African Development Community region is experiencing a shortage of capacity and, since the height of the crisis in 2008, the various utilities have increased focus on generation options.

**Potential energy resources identified in the Southern African Development community are:**

- Hydro resources – Mozambique, Zambia, Angola and the Democratic Republic of Congo
- Coal – Botswana, Mozambique and Zimbabwe
- Natural gas – Mozambique, Namibia and Angola.

Large power generation projects take years to reach commissioning, but in the next year Botswana will commission their Moropule B coal-fired power station and Namibia is installing an additional generating unit at the Ruacana hydro station. These significant steps reduce the dependence on Eskom and create a more vibrant regional energy market. Other projects will be commissioned over the next few years.

Eskom has increased its focus on regional projects, and the first important step is the recognition of electricity imports in the integrated resource plan, which provides the impetus to pursue additional imports. The imports will assist not only with the energy balance in South Africa, but also with improving South Africa’s energy mix.

### Current performance

#### Transmission system performance

<table>
<thead>
<tr>
<th>Measure (and unit)</th>
<th>Description of measure</th>
<th>Target 2011</th>
<th>Actual 2011</th>
<th>Actual 2010</th>
<th>Actual 2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of interruptions</td>
<td>Interruptions affecting the continuity of supply</td>
<td>≤ 35</td>
<td>30</td>
<td>31</td>
<td>31</td>
</tr>
<tr>
<td>Number of system minutes lost</td>
<td>Total number of system minutes lost (for incidents of less than one system minute)</td>
<td>≤ 3.40</td>
<td>2.63 RA</td>
<td>4.09 RA</td>
<td>4.21 RA</td>
</tr>
<tr>
<td>Number of major incidents</td>
<td>Records number of incidents with a severity greater than one system minute.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>– severity degree one (≥ 1 but less than 10)</td>
<td>≤ 2</td>
<td>0 RA</td>
<td>1 RA</td>
<td>3 RA</td>
<td></td>
</tr>
<tr>
<td>– severity degree two (≥ 10 but less than 100)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>– severity degree three (≥ 100)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Number of line faults</td>
<td>Number of transmission line faults per 100km</td>
<td>≤ 2.45</td>
<td>2.72</td>
<td>2.54</td>
<td>2.46</td>
</tr>
</tbody>
</table>

RA – Reasonable assurance provided by the independent assurance provider.

Transmission’s interruption performance is stable. The number of system minutes lost for all interruptions in 2010/11 is a substantive improvement, primarily attributable to reduced plant failure rates and improved plant availability and restoration times for major loads. The risk associated with unfirm and constrained networks did not materially change in 2011.

The line faults target has not been achieved in 2011, mainly due to an increase in the number of fire and bird-related faults and due to lightning following increased rainfall this summer. The increased deployment of fire response teams and servitude vegetation management investments will improve this performance. But post-fault investigation, root-cause analysis and targeted corrective actions remain Eskom’s prime methods to curtail poor asset performance at the lowest cost.

**Environmental performance**

Environmental performance is managed as an integral part of Transmission’s governance structure. Accountable environmental personnel ensure the implementation and management of the environmental management system throughout the division. Transmission’s objective is to ensure continual improvement in environmental performance by setting environmental indicators and through management.
### Key Transmission division environmental and safety performance indicators

<table>
<thead>
<tr>
<th></th>
<th>Target</th>
<th>2011</th>
<th>2010</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of environmental legal contraventions (number)</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>Number of environmental legal contraventions reported in terms of Eskom’s operational health dashboard (number)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Materials containing asbestos disposed of (tons)</td>
<td>n/a</td>
<td>10.5</td>
<td>21.5</td>
<td>391.4</td>
</tr>
<tr>
<td>Material containing polychlorinated biphenyls (PCBs) thermally destructed (tons)</td>
<td>n/a</td>
<td>400.7</td>
<td>3.7</td>
<td>489.2</td>
</tr>
<tr>
<td>Lost-time incident rate (index)</td>
<td>0.26</td>
<td>0.65</td>
<td>0.80</td>
<td>0.63</td>
</tr>
</tbody>
</table>

1. Under certain conditions, contraventions of environmental legislation are classified in terms of the Eskom operational health dashboard (OHD) index. These include instances where censure was received from authorities, non-reporting to authorities as may be legally required, non-reporting in Eskom, a repeat legal contravention, or when the contravention was not addressed adequately. Divisional executives can escalate any significant environmental legal contravention to the OHD.

2. Quantities of waste disposed of at registered waste sites.

3. Lost-time incidents improved from 60 in 2009/10 to 46 this year. Although none of these incidents resulted in an employee fatality, sadly three contractors passed away over the past three years.

### Environmental expenditure

Funds are allocated for environmental capital and operational expenditures. These amounted to R39.1 million on capital projects (2010: R65.9 million) and R35.3 million on operational figures (2010: R31.7 million).

### Key customer update

The Key Sales and Customer Services team is the interface with major industrial customers (customers using a minimum of 100GWh of energy per year). The Eskom KeyCare total quality index measures the satisfaction of about 120 such customers with Eskom’s service. An independent research supplier conducts interviews with senior managers at three levels, namely general management, engineering and accounting. The KeyCare index produces a 12-month moving average as its key performance indicator.

The KeyCare index for 2010/11 was 101% against a target of 100% (2010: 98%).

The Key Sales and Customer Services team has regular interactions, in large and small forums, with key stakeholders, facilitating dialogue and assessing the impact of Eskom’s decisions on key customers’ businesses.

### Some customer interactions:

- Regular customer visits by regional key account managers, lead customer executives and key customer executives are part of day-to-day business and cover the full spectrum of service delivery
- Regional workshops are held on mining and industrial energy optimisation and NRS 048/9
- Quarterly Energy Intensive User Group and Eskom tariff working group meetings update and inform customers on all tariff-related issues
- Quarterly Energy Intensive User Group and industry energy forums update key customers and industry on all electricity-related matters that might impact their businesses
- Eskom liaises with the Energy Intensive User Group monthly to determine the group’s needs and arranges for presenters and presentations
- Key industrial customer forums take place at least once a year to update and inform customers on critical issues affecting their businesses
- Annual strategic planning sessions with the Chamber of Mines and the Energy Intensive User Group solicit their inputs
- Regular chief executive breakfast sessions are held with key industrial customers
- Regular high-level strategic meetings are held with corporate groups to explore opportunities and strengthen relationships.
**Mandate**

To manage a successful retail business and optimally operate and maintain the Eskom distribution electricity network, while managing the Distribution customer base.

Eskom owns 46,712km of distribution lines, 308,899km of reticulation power lines and 11,018km of underground cables in South Africa, representing the largest power line system on the continent of Africa.

<table>
<thead>
<tr>
<th>Highlights</th>
<th>Challenges</th>
</tr>
</thead>
<tbody>
<tr>
<td>- The marginal improvement of the system average interruption duration index performance</td>
<td></td>
</tr>
<tr>
<td>- Achieved a customer service score of 84.37% (2010: 85.05%) against a target of 83.71%</td>
<td></td>
</tr>
<tr>
<td>- Improved level of energy losses due to increased interventions in the management thereof</td>
<td></td>
</tr>
<tr>
<td>- Electrified a total of 4,050,968 homes (2010: 3,901,054) since the inception of the electrification programme in 1991</td>
<td></td>
</tr>
<tr>
<td>- Taken action on more than 90% of wildlife interactions reported to the Eskom/Endangered Wildlife Trust partnership and implemented mitigation measures within four months</td>
<td></td>
</tr>
<tr>
<td>- Performed an internal ISO 14001 review on all regions, highlighting best practices and areas for improvement</td>
<td></td>
</tr>
<tr>
<td>- Engaged with some provincial authorities about permits for cutting protected trees</td>
<td></td>
</tr>
<tr>
<td>- Seen positive results in waste management and data integrity</td>
<td></td>
</tr>
<tr>
<td>- Rolled out various environmental awareness initiatives about climate change.</td>
<td>- The marginal deterioration of the system average interruption frequency index performance</td>
</tr>
<tr>
<td>- The number of legal contraventions, especially tree-cutting incidents, and a few incidents of non-conformance with environmental authorisations.</td>
<td></td>
</tr>
</tbody>
</table>

**Future priorities**

- Improve network reliability and technical performance
- Appropriate network maintenance and capital investments
- Focus on and respond to current and future customer needs
- Renew focus on safety improvements
- Enhance focus on revenue management and collections
- Continue roll-out of Operation Khanyisa to reduce energy theft
- Continue roll-out of split metering
- Standardise, optimise and integrate business processes (Back2Basic)
- Grow human capital through retention of core, critical and scarce resources, complemented by effective skills and talent management.
Benchmarking

Distribution has participated in a 2007 benchmarking study, conducted by an independent international consulting group, with utilities in North and South America. The reporting methodology, network characteristics, environment and operational processes and practices of the distributors in the benchmarking panels are not the same, which results in a wide range of performance levels. This makes any direct performance comparison a challenge.

Eskom’s network interruption performance is dominated by the performance of rural lines, which have been built on a least-cost basis. In this way, Eskom’s distribution networks differ significantly from those of other distribution companies that have supply areas which include large cities and towns. Rural lines in South Africa include long radial lines with very limited redundancy and back-feed capability. This significantly distorts direct comparison with North American distributors in the benchmarking panel.

The South American peer group is more appropriate from a network investment and customer point of view than the North American peer group (as well as European peer groups). The Eskom system average interruption duration index and system average interruption frequency index is in the fourth quartile.

- System average interruption duration index performance in South America (2007) is between 3.5 and 90 hours per year and for Eskom it is 52.61st hours.
- System average interruption frequency index performance in South America is between 2.5 and 60 sustained supply interruption events per year; and for Eskom it is 25.31st events.

International benchmarks for the distribution supply loss index and the reticulation supply loss index are not available.

Material issues

Distribution capital planning

Distribution’s five-year capital plan is updated every year. The plan is derived from all projects in the Distribution regions, divided into lines, cables, transformer numbers and transformer capacity per voltage level per category. The voltage levels used are sub-transmission (above 33kV) and 33kV and below.

As part of its response to the poor system average interruption duration index performance, Distribution is changing the planning approach and criteria.

Strengthening and refurbishment

Strengthening caters for the growth in the network as a result of economic growth, and refurbishment refers to the maintenance of existing network assets. Growth in the electrification programme also requires strengthening the supporting network infrastructure to open up un-electrified areas of South Africa. The National Energy Regulator of South Africa and the grid code require that Eskom maintains a level of network stability and flexibility that can support the growth of existing customers.

There are about 800 to 1 000 constrained feeders in Distribution which means that due to either voltage or transformer capacity limitations, no new connections can be made. Most of these constraints can only be removed by means of sub-transmission infrastructure strengthening. The capital required is about R5 billion which indicates the extent of the backlog. What can be implemented is in the order of R3 billion in the period up to 2014/15.

There is a significant refurbishment backlog, which this capital plan is addressing. Refurbishment expenditure of R1.4 billion per year will ensure that the backlog does not increase. There is a need to change refurbishment strategies and Distribution’s resource constrained ability to execute the strategy. Spending on refurbishment aims to eliminate the backlog over a 10-year period. Distribution is building additional sub-transmission substations to create more feeders and split the existing feeders in response to the reliability challenges with long feeders (in excess of 200km).

Split metering

Split meters reduce the amount of non-technical losses. These devices use two-way communications to detect tampering. In Soweto, the cost of split meters has increased due to the need for secure housings for the meters to prevent tampering or bypassing. After 2014/15, the split metering technology will be incorporated into normal business.

Customer service

Eskom’s service delivery and efficiency is important to South Africa’s economic prosperity, transformation and sustainable development.

By monitoring customer satisfaction, Distribution can plan to ensure that it delivers the required quality of service at the appropriate time and price. A range of statistical perception surveys, conducted by an independent research organisation, is used to measure customers’ satisfaction with the service delivered.

RA – Reasonable Assurance provided by the independent assurance provider (refer page 200).
NERSA approved a revenue requirement of R85.18 billion and a price increase of 24.8% on tariff-based sales for 2010/11. This resulted in a standard average price of 41.57c/kWh.

Refer to the Regulatory and Legal Framework section on page 35 for details of the MYPD 2 process.

The National Energy Regulator of South Africa also decided to replace Eskom’s residential tariff structures with an inclining block tariff. This includes measures to protect the poor, so there are different increases per tariff category. The inclining block tariff has been implemented for metered residential customers. Implementation for prepaid residential customers was limited to the NERSA IBT price levels within the existing structures at first, with full implementation on 1 April 2011.

The inclining block tariff gives significant relief to most residential customers, with customers using more than 1500kWh per month seeing higher than average increases.

The introduction of the inclining block rate tariff
NERSA in its determination announced “In order to provide for cross-subsidies for low income domestic customers, as required by the Electricity Pricing Policy (EPP1), implement residential inclining block rate tariffs concurrently with this price increase. The structure of the inclining block tariffs, together with the average c/kWh and percentage price increases, are as follows:

<table>
<thead>
<tr>
<th>Monthly level Consumption</th>
<th>2010/11</th>
<th>2011/12</th>
<th>2012/13</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>c/kWh</td>
<td>% increase</td>
<td>c/kWh</td>
</tr>
<tr>
<td>Block 1 (≤50kWh)</td>
<td>54.70</td>
<td>(10.59)</td>
<td>57.65</td>
</tr>
<tr>
<td>Block 2 (51 – 350kWh)</td>
<td>58.48</td>
<td>(5.20)</td>
<td>66.16</td>
</tr>
<tr>
<td>Block 3 (351 – 600kWh)</td>
<td>76.35</td>
<td>21.95</td>
<td>96.05</td>
</tr>
<tr>
<td>Block 4 (&gt;600kWh)</td>
<td>83.74</td>
<td>35.82</td>
<td>105.35</td>
</tr>
<tr>
<td>Average residential tariff</td>
<td>60.60</td>
<td>35.82</td>
<td>68.83</td>
</tr>
</tbody>
</table>

Explanation of the price increase implemented to the retail tariffs on 1 April 2010
The annual average price increase approved by the National Energy Regulator of South Africa on all tariffs is 24.8%, calculated from the annual revenues and sales volumes between 2009/10 and 2010/11. The percentage increase is the average impact on customers.

The following should be noted with regards to the tariff:
- The environmental levy charge stays the same and is not included when determining the average increases for the tariff rates
- The National Energy Regulator of South Africa’s subsidy of R1.32 billion for the inclining block tariff is to be recovered from the urban tariffs, further increasing these tariffs by an average 4.8%. Eskom’s rural tariff and tariffs applicable to municipal supplies were excluded from paying the additional subsidy

- The annual increase to municipal tariffs, in compliance with the Municipal Finance Management Act (56 of 2003), was only effective from 1 July 2010. This resulted in a different price increase than the announced annual average, as the increase calculated took into account the environmental levy, the three months at a lower tariff, and the nine months at a higher tariff
  - On 1 July 2010, municipal tariff rates increased by 28.9% plus the environmental levy of 2c/kWh, resulting in a year-on-year annual increase of 24.01%
  - In April 2010, the total non-municipal tariff rates increased by an average of 18.7% plus the environmental levy of 2c/kWh, resulting in a 23.8% year-on-year annual increase.

For details on Eskom’s price increases over the past 17 years, go to www.eskom.co.za/annreport/11/010.html
Free basic electricity

Government aims to bring relief to low-income households through the national electricity basic services support tariff, thereby ensuring optimal socioeconomic benefits from the national electrification programme. Qualifying customers are eligible for 50kWh of free electricity per month.

### Free basic electricity

<table>
<thead>
<tr>
<th>Description</th>
<th>Unit of measure</th>
<th>Actual 2011</th>
<th>Actual 2010</th>
<th>Actual 2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Municipalities contracted to provide FBE</td>
<td>number</td>
<td>243</td>
<td>243</td>
<td>243</td>
</tr>
<tr>
<td>Municipal contracts rolled out</td>
<td>%</td>
<td>99</td>
<td>99</td>
<td>99</td>
</tr>
<tr>
<td>Customers approved by municipalities for FBE</td>
<td>number</td>
<td>1 132 421</td>
<td>1 308 357</td>
<td>1 289 804</td>
</tr>
<tr>
<td>Customers’ meters reconfigured to receive FBE</td>
<td>number</td>
<td>1 141 235</td>
<td>1 294 997</td>
<td>1 233 012</td>
</tr>
<tr>
<td>Reconfigured FBE customer meters in the year</td>
<td>average %</td>
<td>100</td>
<td>99</td>
<td>96</td>
</tr>
<tr>
<td>Amount invoiced to contracted municipalities</td>
<td>Rm</td>
<td>273</td>
<td>308</td>
<td>197</td>
</tr>
</tbody>
</table>

Refer to [www.eskom.co.za/annreport11/011.html](http://www.eskom.co.za/annreport11/011.html) for more information regarding free basic electricity.

Management of total energy losses

Energy losses reflect the difference between the quantity of energy sent out from the power stations and the quantity sold to the various customers at the end of the value chain.

There are two broad categories of energy losses:

- Technical energy losses naturally occur when electrical energy is transferred from one point to another. The medium through which electrical energy is transferred imposes a resistance to the flow and some of the energy is dissipated as heat.
- Non-technical energy losses can be calculated as the difference between total energy losses and technical losses. They are typically caused by theft (illegal connections, meter tampering), errors in data and billing, among others.

In 2010/11, total Distribution energy losses were 5.68%RA, of which non-technical losses are estimated to be between 1.4% and 2.3%. Compared to other utilities globally, Eskom continues to perform well on energy loss management. Distribution has participated in a 2007 benchmarking study, conducted by an independent international consulting group, mainly with South American utilities. The 2007 benchmarking parameters for total distribution losses were 5.60% to 12.07%. Eskom is currently in the first quartile of the top performing distribution utilities.

Even though Eskom compares favourably with other utilities, energy losses are a key focus area and the level of energy losses has improved. Actual results are better than the National Energy Regulator of South Africa’s target energy losses.
For internal evaluation purposes the estimated technical losses range between 60% and 75% of total losses in Distribution, while 100% is estimated for the Transmission networks. The actual percentage in Distribution is influenced by factors such as network design, network topology, load distribution on the network and network operations.

**Operation Khanyisa**

The energy losses management programme has stabilised distribution energy losses at below 6% through audits and corrective measures, conducting energy balancing of ring-fenced areas, implementing tested technologies, and a public awareness campaign, called Operation Khanyisa.

Operation Khanyisa, launched in October 2010, is a national campaign to mobilise all sectors of South African society around legal power use. The theme of the campaign is sustainability for economic growth. Last year, the losses suffered by Eskom and local government were estimated at R4.4 billion a year: Electricity theft contributes to power outages, rising prices, the slowing down of the economy, job losses and fatalities and injuries due to electrocutions. It also affects government’s universal access programme.

The core partners of Operation Khanyisa are Proudly South African, Business Against Crime, Business Unity South Africa, the South African Local Government Association and Primedia Crime Line. The campaign is currently active only in Eskom areas of supply, but the intention is to expand into areas serviced by municipalities, hence the importance of the partnership with the South African Local Government Association. Although the focus of the campaign is electricity theft, it integrates related issues such as safety, non-payment, energy efficiency and infrastructure theft.

Some of the major milestones achieved in the current financial year include:

- Testing the approach
- Agricultural launch, National Maize Producers Organisation (NAMPO) – May 2010
- Soweto media launch – June 2010
- Eskom employee launch – June 2010
- National launch – October 2010
- Letter of endorsement from the President – October 2010
- External and internal baseline research completed
- Five pilot sites successfully launched – November and December 2010
- Full media roll out – print, electronic and outdoor billboards.

Operation Khanyisa will be fully implemented in 2011/12.
Electrification

The Department of Energy began funding the integrated national electrification programme in April 2001. Eskom implements the programme in its licensed areas of supply on the department’s behalf. (Electrification in a municipality’s licensed areas of supply is carried out by that municipality.) Eskom carries the operating costs for the electrification programme, as the licensed distributor supplying electricity to its customers. Funding is currently made available for new connections and infrastructure development that are part of the integrated national electrification programme. The average cost of infrastructure development and the cost per connection is likely to increase as more remote rural areas are electrified. In addition, technical specifications for network design have been enhanced to better accommodate future growth in electricity demand and to improve the quality and reliability of the electricity supply in these areas.

Since the start of the electrification programme in 1991, 4 050 968 homes (2010: 3 901 054) have been electrified.

<table>
<thead>
<tr>
<th>Electrification programme</th>
<th>Unit of measure</th>
<th>Target 2011</th>
<th>Actual 2011</th>
<th>Actual 2010</th>
<th>Actual 2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total connections</td>
<td>number</td>
<td>158 430</td>
<td>149 914</td>
<td>149 901</td>
<td>112 965</td>
</tr>
<tr>
<td>Direct connections, excluding farm workers</td>
<td>number</td>
<td>157 844</td>
<td>149 112</td>
<td>149 028</td>
<td>111 903</td>
</tr>
<tr>
<td>Farm worker connections</td>
<td>number</td>
<td>586</td>
<td>802</td>
<td>873</td>
<td>1 062</td>
</tr>
<tr>
<td>Total capital investment</td>
<td>Rm</td>
<td>1 849</td>
<td>1 512</td>
<td>1 086</td>
<td>798</td>
</tr>
<tr>
<td>Reticulation and connections</td>
<td>Rm</td>
<td>1 208</td>
<td>949</td>
<td>914</td>
<td>682</td>
</tr>
<tr>
<td>Sub-transmission infrastructure development</td>
<td>Rm</td>
<td>637</td>
<td>559</td>
<td>169</td>
<td>113</td>
</tr>
<tr>
<td>Farm worker connection incentives paid</td>
<td>Rm</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>3</td>
</tr>
</tbody>
</table>

The targets have not been achieved due to delays in concluding some commercial contracts. Targets for connections funded by the Department of Energy have been met. The shortfall relates to Eskom funded infills for which approval to continue was only obtained later in the financial year.

Meeting universal access targets in the future is primarily dependent on the availability of funding from the department via the integrated national electrification programme. Eskom engages with the department and other key stakeholders on the planning, funding and other requirements for universal access.

Electrification of grid schools and clinics

<table>
<thead>
<tr>
<th>Electrification of grid schools and clinics</th>
<th>Unit of measure</th>
<th>Target 2011</th>
<th>Actual 2011</th>
<th>Actual 2010</th>
<th>Actual 2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capital investment</td>
<td>Rm</td>
<td>175</td>
<td>158</td>
<td>142</td>
<td>108</td>
</tr>
<tr>
<td>Total connections</td>
<td>number</td>
<td>644</td>
<td>854</td>
<td>774</td>
<td>479</td>
</tr>
</tbody>
</table>

The electrification of schools and clinics is funded by the Department of Energy through the National Electrification Fund. This programme is focused on electrifying specifically identified schools and clinics.
Customer Network Business continued

Customer debt has doubled in rand value over the past three to four years. It is growing fastest in Soweto, where it includes historical debt. Large power user debt is fairly well managed, but recently risks in this category have increased with the redistributors (municipalities) and EB Steam and Pamodzi. Supply to EB Steam cannot be suspended due to a court interdict. Pamodzi’s energy supply has been suspended except for their water pump, due to health and safety reasons. Significant tariff increases are contributing to the 10% growth in small power user debt since the end of June 2010. This is a lagging but emerging risk.

Municipal arrear electricity debts decrease significantly in July, November and March, as the municipalities utilise their equitable share allocations from National Treasury to settle their Eskom debt. The annual equitable share allocations to municipalities are gazetted and are transferred in three tranches, 41.7% in July, 33.3% in November and 25.0% in March. Eskom regions work closely with municipalities and the Provincial Departments of Cooperative Governance to understand the exact amounts being transferred to municipalities. Delays in equitable share transfers do occur sometimes, which results in the late settlement of the arrear debt. In some instances, the arrear debt exceeds the equitable share amount received, resulting in the inability of a municipality to clear the arrear debt with Eskom. It is a concern that these payments and actions taken through the normal Promotion of Administrative Justice Act (PAJA) process to recover Eskom debt are not creating a long-term sustainable solution for Eskom.

A turnaround strategy for Soweto debt is being developed as part of the energy losses management programme. The strategy will focus on persuading Soweto customers to voluntarily change their behaviour and become legal power users. This will include among others, rolling out an integrated social marketing campaign to secure community buy-in, stakeholder support, forging partnerships with local key influencers, facilitating community development and driving transparent communication. Incentives will also be provided to encourage the right behaviour: Investment in the latest technology in the form of protective enclosures with split prepaid meters to discourage illegal connections and encourage payment for electricity consumed is being considered as part of the solution.

**Strategies to address non-payment:**
- Convert to prepaid in the residential sector
- Focus on customers that struggle to afford electricity
- Focus on agricultural, industrial, mining and commercial customers with overdue debt of more than R10 000
- Review the revenue security policy to ensure risk mitigation relating to customer payments
- Consult with government and the National Energy Regulator of South Africa
- Get buy-in from stakeholders in the collection process to deal with redistributors
- Deploy the adopt-a-municipality programme with national government
- Report regularly to National Treasury on the status of municipal debt
- Mobilise a contact centre to do national debt collection
- Rationalise contact centres to maximise revenue collection (dependent on strategic direction project)
- Improve payment at day 30 by listing slow-paying small power user customers with credit bureaux
- Review debt and credit management structures in the Distribution division.

**Municipal debt older than 30 days**

(R million)

![Graph showing municipal debt older than 30 days](image-url)
Current performance

Distribution system performance

<table>
<thead>
<tr>
<th>Measure</th>
<th>Description of measure (and unit)</th>
<th>Target 2011</th>
<th>Actual 2011</th>
<th>Actual 2010</th>
<th>Actual 2009</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distribution supply loss index (DSLI)</td>
<td>Distribution network unavailability index (minutes per month)</td>
<td>n/a1 (≤8.70)</td>
<td>12.81</td>
<td>12.30</td>
<td>9.17</td>
<td>Target not achieved. See comments for DSLI and RSLI below.</td>
</tr>
<tr>
<td>Reticulation supply loss index (RSLI)</td>
<td>Reticulation network unavailability index (hours per annum)</td>
<td>n/a1 (≤2.20)</td>
<td>2.28</td>
<td>2.43</td>
<td>2.16</td>
<td>Target not achieved. See comments for DSLI and RSLI below.</td>
</tr>
<tr>
<td>Reticulation supply loss index (RSLI)</td>
<td>Unplanned reticulation network unavailability index (hours per annum)</td>
<td>n/a1 (≤1.60)</td>
<td>1.85</td>
<td>1.84</td>
<td>1.70</td>
<td>Target not achieved. See comments for DSLI and RSLI below.</td>
</tr>
<tr>
<td>System average interruption frequency index (SAIFI)</td>
<td>Reliability of supply index (number per annum)</td>
<td>≤23.20</td>
<td>25.31a</td>
<td>24.65a</td>
<td>24.16a</td>
<td>Target not achieved. See comments for SAIFI and SAIDI below.</td>
</tr>
<tr>
<td>System average interruption duration index (SAIDI)</td>
<td>Availability of supply index (hours per annum)</td>
<td>≤49.50</td>
<td>52.61a</td>
<td>54.41a</td>
<td>51.51a</td>
<td>Target not achieved. See comments for SAIFI and SAIDI below.</td>
</tr>
</tbody>
</table>

Distribution has begun to improve the accuracy of reporting on the distribution supply loss index and the reticulation supply loss index. Current reporting is a best estimate, and this needs to be taken into consideration for year-on-year evaluation and comparative analysis.

Performance on the interruption frequency index has marginally deteriorated, and performance has marginally improved on the interruption duration index since last year. Targets have not been achieved because of resource constraints, impact of conductor/equipment theft on resources and adverse weather conditions in 2010/11. Initiatives to improve network performance are taking longer than anticipated to show results. There has been an increased focus on planned work.

Key initiatives to improve performance and reduce the impact of planned and unplanned outages on customers:
- Increased use of live-line techniques
- Increased network visibility and remote control of switching devices
- Improved outage management and co-ordination
- Enhanced asset management processes
- Increased maintenance and refurbishment expenditure
- Improvement plans for worst performing networks.

Refer to www.eskom.co.za/anreport11/012.html or more information on distribution system performance.

RA – Reasonable assurance provided by the independent assurance provider (refer page 200).

1. There are no DSLI and RSLI targets for 2010/11. The figures in brackets represent the targets for financial year end March 2010.
Customer Network Business  
Distribution division  
continued

Customer service index

Eskom uses a composite index to measure the service delivered to its Distribution customers. The index combines the results of two external customer service perception surveys and four internal customer service process measures. Eskom achieved a score of 84.37% (2010: 85.05%) against the target of 83.71%.

Eskom uses these results to identify which aspects of service require improvement. Once action plans have been re-prioritised and implemented, success is tracked by monitoring the trends for those specific aspects of service.

Customer service index results:

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>External customer perception surveys:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>– Enhanced MaxiCare</td>
<td>≥90.60</td>
<td>89.40</td>
<td>92.95</td>
<td>92.80</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>– CustomerCare</td>
<td>≥80.00</td>
<td>82.30</td>
<td>80.70</td>
<td>81.70</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td><strong>Internal performance measures:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>– Restoration time &lt;7.5 hours</td>
<td>≥80.00</td>
<td>66.93</td>
<td>72.15</td>
<td>72.80</td>
<td>n/a</td>
<td>90.00</td>
</tr>
<tr>
<td>– Minor projects quotations &lt;30 days</td>
<td>≥85.00</td>
<td>86.00</td>
<td>90.00</td>
<td>85.00</td>
<td>n/a</td>
<td>95.00</td>
</tr>
<tr>
<td>– Minor projects connections &lt;90 days</td>
<td>≥81.00</td>
<td>82.00</td>
<td>78.00</td>
<td>73.00</td>
<td>n/a</td>
<td>95.00</td>
</tr>
<tr>
<td>– Contact centre service level</td>
<td>≥80.00</td>
<td>83.80</td>
<td>82.60</td>
<td>84.00</td>
<td>Q1</td>
<td>80.00</td>
</tr>
<tr>
<td><strong>Weighted customer service index</strong></td>
<td>≥83.71</td>
<td>84.37</td>
<td>85.05</td>
<td>84.74</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Distribution has participated in a 2009 international benchmarking study conducted by an independent international consulting group. As per the benchmarking study, the first quartile performance for contact centre service level is >70%.

Eskom is currently in the first quartile of contact centre service performance per the benchmarking study. The minimum standard specified in NRS047-1:2005 is 80%. Eskom achieved year-on-year improvement despite the growth in call volumes queued into the contact centres, which increased by 6.1% to 5.66 million calls (2010: 5.33 million). The improvement is due to good planning, performance management and efficiencies in virtual call flow between sites. The handling of emergency situations also improved.

Refer to www.eskom.co.za/annreport11/013 for more information about the measuring of customer satisfaction.

Environmental and safety performance

<table>
<thead>
<tr>
<th></th>
<th>Target 2011</th>
<th>Actual 2011</th>
<th>Actual 2010</th>
<th>Actual 2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of environmental legal contraventions (number)</td>
<td>0</td>
<td>12</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Number of environmental legal contraventions reported in terms of Eskom’s operational health dashboard(^1) (number)</td>
<td>0</td>
<td>2(^2)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Materials containing asbestos disposed of (tons)</td>
<td>n/a</td>
<td>285.8</td>
<td>16.2</td>
<td>40.2</td>
</tr>
<tr>
<td>Material containing polychlorinated biphenyls (PCBs) disposed of (tons)</td>
<td>n/a</td>
<td>18.0</td>
<td>13.3</td>
<td>15.0</td>
</tr>
<tr>
<td>Lost-time incident rate (index)(^3)</td>
<td>0.26</td>
<td>0.64</td>
<td>0.72</td>
<td>0.57</td>
</tr>
</tbody>
</table>

1. Under certain conditions, contraventions of environmental legislation are classified in terms of the Eskom operational health dashboard (OHD) index. These include instances where censure was received from authorities, non-reporting to authorities as may be legally required, non-reporting in Eskom, or repeat legal contravention, or when the contravention was not addressed adequately. Divisional executives can escalate any significant environmental legal contravention to the OHD.

2. Repeat environmental legal contraventions registered in Eastern Region and Northern Region related to occasions where protected Marula trees were cut without permits.

3. Lost-time incidents improved to 154 in 2010/11 from 163 in 2009/10. Unfortunately there were eight employee fatalities and 13 contractor fatalities over the past three years.
Integrated Demand Management division

Mandate

Design integrated solutions to mobilise a culture of energy efficiency to solve complex energy demand issues for a sustainable future for South Africa.

Overview

The Integrated Demand Management division, dedicated to ensuring short-term security of supply, was created in 2010. Eskom has long offered programmes for supporting and funding energy efficiency. Integrated Demand Management integrates previously fragmented activities across the business and positions energy efficiency as a key core business in Eskom for the first time. The division’s initiatives and programmes are all aimed at balancing supply and demand in the short to medium term, and are consolidated and co-ordinated for optimal effect. The division is mandated to drive Eskom’s demand management response to the projected shortage of electricity, and the building of a sustainable, energy-efficient society.

Andrew Etzinger  Senior General Manager: Integrated Demand Management

How Integrated Demand Management will achieve its objectives:

- Implement a step change in demand management delivery through an integrated and innovative portfolio of demand management initiatives
- Use Eskom and national resources to deliver the national demand management initiative
- Communicate transparently the extent and nature of the electricity crisis to create acute national awareness to drive the required response
- Partner with stakeholders through a pro-active and collaborative approach to contribute to national energy efficiency objectives.

The National Energy Regulator of South Africa has allocated R5.44 billion to fund these initiatives over three years. Certain initiatives are fully funded, while Eskom contributes to others.

<table>
<thead>
<tr>
<th>Highlights</th>
<th>Future priorities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Achieved the demand and annualised energy savings targets for the year</td>
<td>Implement the energy conservation scheme</td>
</tr>
<tr>
<td>Successfully concluded the roll-out of over 47 million compact fluorescent lamps in the residential sector nation-wide since the programme began. This has realised an equivalent annual demand savings of 1 958MW for all CFLs verified since inception in December 2003</td>
<td>Step up demand management projects</td>
</tr>
<tr>
<td>Accelerated the solar water heating rebate whereby over 10 000 claims are being received and processed monthly</td>
<td>Investigate new opportunities such as efficient downlighters</td>
</tr>
<tr>
<td>Power Alert continued to drive savings in critical time. During the year average demand savings of 174MW were attained which translated to 44.4GWh of energy savings. During the 2010 FIFA World Cup™ period an estimated demand reduction of 608MW was achieved</td>
<td></td>
</tr>
</tbody>
</table>
Customer Network Business continued
Integrated Demand Management division continued

**Benchmarking**

Eskom’s compact fluorescent lamp programme is the largest free mass roll-out of compact fluorescent lamps in the world, with over 47 million bulbs distributed.

Mexico and India have large programmes. Mexico’s target is 30 million bulbs. The programme will be in stages, with the first stage targeting only 1 million bulbs. India will be targeting a 400 million bulb project, but it will not be free distribution. It is planned that 85% of the cost of a bulb will be subsidised. The roll-out of 15 million bulbs has started in the Kerala province and is due for completion in mid-2011.

England, Rwanda, Senegal and China have all had smaller compact fluorescent lamp roll-outs of less than 1.5 million bulbs each.

Source: Project Design Document (PDD), CUDEMOS Mexico (Campana De Uso Intelegente De Energia Mexico) Smart Use of Energy Mexico.

**Material issues**

**Demand market participation (DMP)**

The demand market participation programme allows customers with flexible load to contract with Eskom to reduce their load on a year-ahead or day-ahead basis. On any contracted day, Eskom has the right to instruct the participant to reduce their load, if and when needed, as part of Eskom’s contracted reserves for the day. This occurs on Eskom’s instruction during periods of supply constraints. The programme has various categories in which a customer can participate, determined by their unique plant characteristics, response time ability, period they can reduce load, cost implication, etc.

On a daily basis, Eskom compares the cost of these flexible load resources with other resources it has available for the next day, and schedules the required reserves days ahead. The programme is approved by NERSA and has resulted in major benefits to customers and the economy – electricity charges are reduced and load shedding is avoided.

**Energy conservation scheme**

In January 2008, Eskom began developing the power conservation programme on behalf of national government. The programme is to help the Department of Energy create a sufficient reduction in demand to allow for both essential generation plant maintenance as well as economic growth. The gap between available supply and projected electricity consumption is still a major concern, especially for the period 2011 to 2015.

The medium-term risk mitigation team recommended the formation of the energy conservation scheme. The team is a joint technical initiative between government, industry and business, the municipalities and Eskom, established to advise the Department of Energy on the appropriate strategies to address security of supply risks.

Eskom implemented a voluntary energy conservation scheme in July 2008 with its top 250 customers. The scheme has been developed to align closely with the envisaged regulatory scheme and also has an allocation management system to help customers load their baselines and manage their monthly allocations. Since the start of the programme, 134 customers have accepted their baselines and an energy saving of about 5% has been achieved.

**Efficient lighting**

The mass implementation of compact fluorescent lamps was concluded in 2010/11. Since the inception of the DSM programme in December 2003 over 47 million bulbs have been installed country-wide in the residential sector, realising demand savings of 1 958MW. An exchange programme swapped about eight million compact fluorescent bulbs with incandescent bulbs at exchange points in high public traffic areas.

**Solar water heating**

South Africa has one of the highest incoming solar radiation levels in the world, making it a prime candidate for solar water heating. It is an ideal solution for households and has industrial and commercial applications. Eskom’s solar water heating programme offers a rebate to customers to use solar power instead of electricity to heat water. Customers can either replace existing electrically heated geysers with solar heated systems or they can install low-pressure solar water heating systems to replace water heating via other electrical appliances.

A decrease in the rebate was announced in April 2011 in order to extend the available funds as far as possible while supporting the manufacture of systems locally.

The revised rebate gave momentum to the sales of solar water heating systems. Some 60 183 claims were received, of which 41 690 were paid. Of these, 28 612 claims (13 147 high-pressure systems and 15 465 low-pressure systems) were submitted to Energy Audits for measurement and verification. Units not verified this financial year will be verified in 2011/12.

Refer to www.eskom.co.za/anreport11/014.html for information about other energy saving tools and schemes being promoted by Eskom.
An extensive marketing and communications strategy has been implemented, strengthening relationships with customers, municipalities and the public. Various campaigns have been launched, using advertising (print and radio), public relations (including media) and community activation and education.

Refer to www.eskom.co.za/annreport11/015.html for information about marketing and communications campaigns.

**Current performance**

Since 2004, when demand-side management projects were initiated and measured, the demand savings in the evening peak (18:00 to 20:00) have risen in line with the growing requirement for demand reduction. Integrated Demand Management has used energy services company-related projects in the industrial, mining, and commercial sectors of the economy in addition to hot water load management within the municipal environments.

The accumulated verified demand savings, for the combined financial years 2005 to 2011, is 2 717MW. A single power station generator unit contributes approximately 600MW to the national grid and therefore DSM has “freed up” more than four generators (a typical power station has six) in the past four years.

The total Eskom evening peak demand savings achieved over the period is 354.1MW against the Eskom target of 301MW (2010: 372MW). This includes 345.1MW verifiable for NERSA and Department of Energy funded projects and 9MW for a project implemented through the DSM advisory service policy. The annualised energy savings for this financial year are 1 339GWh against the target of 994GWh. These results are made up as per the table below:

<table>
<thead>
<tr>
<th>Programme category</th>
<th>Savings achieved (MW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential lighting</td>
<td>199.1</td>
</tr>
<tr>
<td>Water heating load management</td>
<td>31.7</td>
</tr>
<tr>
<td>Compressed air systems</td>
<td>41.9</td>
</tr>
<tr>
<td>Industrial process optimisation</td>
<td>73.1</td>
</tr>
<tr>
<td>Commercial and industrial lighting and air-conditioning</td>
<td>2.1</td>
</tr>
<tr>
<td>Solar water heating</td>
<td>5.9</td>
</tr>
<tr>
<td>Heat pumps</td>
<td>0.3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>354.1</strong></td>
</tr>
</tbody>
</table>

The following expenditure for the financial year was incurred on the above programmes:

<table>
<thead>
<tr>
<th>Programme category</th>
<th>R million</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential lighting</td>
<td>47</td>
</tr>
<tr>
<td>Water heating load management</td>
<td>25</td>
</tr>
<tr>
<td>Compressed air systems</td>
<td>98</td>
</tr>
<tr>
<td>Industrial process optimisation</td>
<td>70</td>
</tr>
<tr>
<td>Commercial and industrial lighting and air-conditioning</td>
<td>40</td>
</tr>
<tr>
<td>Solar water heating</td>
<td>225</td>
</tr>
<tr>
<td>Heat pumps</td>
<td>40</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>545</strong></td>
</tr>
</tbody>
</table>

The following diagram illustrates the verified accumulated demand savings (MW) against the accumulated Eskom target per year.
Eskom Enterprises (Pty) Limited

Mandate 196
Financial results 197
Structure of Eskom Enterprises 197
Current performance 198
Eskom Enterprises (Pty) Limited

Mandate

Provides lifecycle support and plant maintenance, network protection and support for the capacity expansion programme for all Eskom Holdings Limited divisions.

<table>
<thead>
<tr>
<th>Highlights</th>
<th>Challenges</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Supported Eskom in managing coal supplies during the transport strike</td>
<td>• Five recorded fatalities, and a deterioration in overall safety performance</td>
</tr>
<tr>
<td>• Rotek Industries provided a flexible response to the tight power station outage programme</td>
<td>• Reduction in sustained demand for civil construction</td>
</tr>
<tr>
<td>• Supported Eskom’s road repair initiatives</td>
<td>• Suboptimal utilisation of assets and resources.</td>
</tr>
<tr>
<td>• Signed the settlement agreement, covering exit from the Eskom Energie Manantali concession</td>
<td></td>
</tr>
<tr>
<td>• Rotek Industries opened a state-of-the-art new transformer repair and testing facility.</td>
<td></td>
</tr>
</tbody>
</table>

Future priorities

• Reposition Eskom Enterprises’ divisional assets into Eskom Holdings
• Integrate Rotek and Roshcon into a single company, with high quality products and focused on meeting Eskom’s needs cost effectively
• Focus on skills – through a retention strategy, talent management and pipelining of skills – to grow the capacity and capabilities of the group
• Implement Back2Basics supported by Eskom Holdings’ standard policy, process and system solution
• Upgrade and integrate Eskom’s telecommunications assets in support of an integrated ICT solution
• Manage the final exit from the Eskom Energie Manantali concession
• Improve safety initiatives as part of the safety excellence programme
• Effective contractor safety management.
Financial results

<table>
<thead>
<tr>
<th></th>
<th>2011</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total revenue</td>
<td>6 214</td>
<td>6 797</td>
</tr>
<tr>
<td>Profit for the year (after tax)</td>
<td>283</td>
<td>152</td>
</tr>
<tr>
<td>Total assets</td>
<td>7 165</td>
<td>7 295</td>
</tr>
<tr>
<td>Capital expenditure</td>
<td>208</td>
<td>509</td>
</tr>
</tbody>
</table>

Structure of Eskom Enterprises

Eskom Enterprises was formed in 1999 to carry out the non-regulated, electricity-related activities of the Group in South Africa, and all its other energy and related activities outside South Africa. Eskom Enterprises is an asset- and investment-holding company, carrying out non-regulated work such as telecommunication, network protection and measurement. It also houses a number of operating subsidiaries. The group is structured as below.

1. Only operating companies are depicted

Rotek Industries (Pty) Limited
- Power generation services – repairs and maintains turbo machinery.
- Power distribution services – repairs and maintains transformers and switchgear equipment.
- Bulk water services – operates, repairs and maintains water schemes.

Roshcon (Pty) Limited
- Electrical infrastructure – manages electrification contracts and electricity revenue management services.
- Civil infrastructure – is active in general civil construction.
- Waste, environmental and bulk materials – manages bulk materials vital to Eskom, specifically ash and coal.

Eskom Enterprises also operates and maintains Eskom’s private telecommunications network, which is vital to the operation of the system that integrates the delivery of power from Eskom’s power stations to the major substations. Eskom Enterprises played a significant role in developing the telecommunications technology strategy for Eskom.
Eskom Enterprises (Pty) Ltd continued

Current performance

Safety performance

<table>
<thead>
<tr>
<th>Performance measure</th>
<th>Target 2011</th>
<th>Actual 2011</th>
<th>Actual 2010</th>
<th>Actual 2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lost-time incident rate (employees)</td>
<td>0.20</td>
<td>0.39</td>
<td>0.33&lt;sup&gt;1&lt;/sup&gt;</td>
<td>0.50</td>
</tr>
<tr>
<td>Lost-time incident rate (contractors)</td>
<td>0.40</td>
<td>0.44</td>
<td>0.24</td>
<td>0.43</td>
</tr>
<tr>
<td>Fatalities (employees (number))</td>
<td>0</td>
<td>3</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Fatalities (contractors (number))</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

In 2011, 61 lost-time incidents (2010: 55<sup>1</sup>) were reported, for employees and contractors. Regrettably, there were five fatal incidents during the year (2010: 1) – three employees and two contractors. The employee lost-time incident rate worsened from 0.33<sup>1</sup> in 2010 to 0.39 during the current financial year, while the contractor lost-time incident rate also deteriorated from 0.24 in 2010 to 0.44 at year end, mainly as a result of the fatalities and a higher number of incidents than the previous year.

Environmental performance

Environmental performance indicators

<table>
<thead>
<tr>
<th>Environmental performance indicators</th>
<th>Target</th>
<th>2011</th>
<th>2010</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of environmental legal contraventions (number)</td>
<td>0</td>
<td>3&lt;sup&gt;4&lt;/sup&gt;</td>
<td>15</td>
<td>24</td>
</tr>
<tr>
<td>Number of environmental legal contraventions reported in terms of Eskom’s operational health dashboard (number)&lt;sup&gt;2&lt;/sup&gt;</td>
<td>0</td>
<td>4</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Materials containing asbestos disposed of (tons)&lt;sup&gt;3&lt;/sup&gt;</td>
<td>n/a</td>
<td>6.6</td>
<td>73.6</td>
<td>279.4</td>
</tr>
<tr>
<td>Materials containing polychlorinated biphenyls (PCBs) thermally destroyed (tons)</td>
<td>n/a</td>
<td>1.1</td>
<td>1.2</td>
<td>1.4</td>
</tr>
</tbody>
</table>

<sup>1</sup> Restated.
<sup>2</sup> Under certain conditions, contraventions of environmental legislation are classified in terms of the Eskom operational health dashboard (OHD) index. These include instances where censure was received from authorities, non-reporting to authorities as may be legally required, non-reporting in Eskom, a repeat legal contravention, or when the contravention was not addressed adequately. Divisional executives can escalate any significant environmental legal contravention to the OHD.
<sup>3</sup> Quantities of waste disposed of at registered waste sites.
<sup>4</sup> The figure is not comparable to prior years, due to business structural changes.
On 1 November 2010, Rotek Industries, a subsidiary of Eskom specialising in the repair of transformers, opened its new transformer test bay facility in Rosherville, Germiston, where Eskom transformers will be refurbished and tested. The new facility will speed up refurbishment and ensure that Eskom’s transformers meet national and international performance standards.

The Rotek Industries facility is the only test bay in Africa that can run high-voltage tests in a short space of time compared to the conventional two-week process. It is capable of testing some of the largest power generation and transmission transformers in the world. The test facility uses state-of-the art technology, such as static converters for power frequency and high frequency tests. It will have a significant impact on capacity and will heighten Eskom’s maintenance plan, thus ensuring a secure electricity supply. The facility can serve not only Eskom but also large private energy users.

The measuring instrumentation is digital, with a measurement error of less than 0.05%. This will improve the reliability factor significantly.
To the directors of Eskom Holdings Limited

We have undertaken an assurance engagement on selected sustainability information as described below and presented it in the 2011 Eskom Integrated Annual Report (the report) of Eskom Holdings Limited (Eskom) for the year ended 31 March 2011.

We have complied with the International Federation of Accountants (IFAC) Code of Ethics for Professional Accountants, which includes comprehensive independence and other requirements founded on fundamental principles of integrity, objectivity, professional competence and due care, confidentiality and professional behaviour.

Our engagement was conducted by a multi-disciplinary team of health, safety, environmental and assurance specialists with extensive experience in sustainability reporting.

Level of assurance on selected sustainability information

The assurance we are required to provide is as follows:

1. Limited assurance on Eskom’s assertions regarding its alignment with AA1000APS (2008) principles (inclusivity, materiality and responsiveness) as described on page 20 of the report;

2. Reasonable assurance on the following key performance indicators prepared in accordance with the Global Reporting Initiative (GRI) G3 Guidelines, marked with an “RA” on the relevant pages of the report:
   - Technical performance parameters – Unplanned capability loss factor, unit capability factor, energy availability factor, system minutes lost, major incidents, system average interruption frequency index (SAIFI), system average interruption duration index (SAIDI), national load shedding (Generation induced) or unserved energy and energy losses (transmission and distribution);
   - Environmental performance parameters – Coal purchased – stock days, specific water consumption, liquid fuel usage, demand-side management (megawatts and annualised gigawatts), particulate emissions, carbon dioxide emissions, sulphur dioxide emissions, nitrogen oxides emissions, low-level radioactive waste generated and disposed, intermediate level radioactive waste generated and disposed, polychlorinated biphenyls (PCBs) thermally destructed, asbestos disposed, ash (produced, recycled and disposed), environmental legal contraventions and internal energy efficiency (non-essential energy consumption);
   - Social performance parameters – Skills and development (Eskom trainees/bursars – learner pipeline, number of engineering trainees/apprentices, additional number of non-Eskom learners on Eskom-sponsored learning), human resource operational measurements (disabilities), corporate social investment spend, employee and contractor work-related fatalities, employee lost-time injury rate (LTIR), Broad-Based Black Employment Equity (B-BBEE) expenditure – Company (attributable spend, attributable spend percentage and attributable black women-owned spend);
   - Economic parameters – Generation capacity installed and commissioned, transmission lines installed, transmission megawatt amperes (MVA) installed, percentage of local content in new build contracts, cost of electricity, ratio of debt to equity (the debt:equity ratio) and interest cover;

3. Limited assurance on Eskom’s self-declaration of the GRI B+ Application Level (page 20)

Directors’ responsibilities

The directors are responsible for the selection, preparation and presentation of the sustainability information, the identification of stakeholder requirements and material issues, for commitments with respect to sustainability performance, and establishing and maintaining appropriate performance management and internal control systems from which the reported information is derived, and for such internal control as the directors determine to be necessary to enable the preparation of the report that is free from material misstatement, whether due to fraud or error.

The directors are also responsible for the selection and application of the criteria detailed below:

- The AA1000APS (2008) for Eskom’s assertions regarding its alignment with AA1000APS (2008) principles (inclusivity, materiality and responsiveness);
- The GRI G3 Guidelines applied to the selected key performance indicators; and
- The GRI G3 Guidelines on Eskom’s self-declaration of the GRI B+ Application Level.

Our responsibility

Our responsibility is to express assurance conclusions on the selected sustainability information based on our work performed. We have conducted our engagement in accordance with the International Standard on Assurance Engagements (ISAE 3000), Assurance Engagements other than the Audits or Reviews of Historical Financial Information, issued by the International Auditing and Assurance Standards Board. That standard requires that we plan and perform our engagement to obtain assurance about whether the selected sustainability information is free from material misstatement.

Our procedures and the extent of our procedures depend on our judgement including the risks of material misstatement of the selected sustainability information. In a limited assurance engagement, the evidence gathering procedures are less than where reasonable
assurance is expressed. In making our risk assessments, we considered internal control relevant to Eskom’s preparation of the report. We believe the evidence we have obtained is sufficient and appropriate to provide a basis for our conclusions.

Summary of work performed
Our work included the following evidence-gathering procedures at corporate, divisional and site level:

- Interviews with management and senior executives to evaluate the application of the GRI G3 Guidelines and the AA1000APS (2008)1 principles and to obtain an understanding of the control environment relative to the reported sustainability information
- Inspecting documentation to corroborate the statements of management and senior executives in our interviews
- Testing the processes and systems to generate, collate, aggregate, monitor and report the selected sustainability information
- Inspecting supporting documentation and performing analytical procedures
- Visiting business units including Koeberg (nuclear power station), Arnot (coal power station), Tutuka (coal power station), Lethabo (coal power station), Matla (coal power station), Kendal (coal power station), Kriel (coal power station), Majuba (coal power station), Camden (coal power station), Duvha (coal power station), Transmission division, the Western Distribution region, Northern Distribution region, Central Distribution region, Roshcon (Enterprises) and Rotek (Enterprises)
- Conducting an application level check on the report to evaluate whether all disclosure requirements of the GRI B+ Application Level have been adhered to. Evaluating whether the information presented in the report is consistent with our findings, overall knowledge and experience of sustainability management and performance at Eskom.

Conclusions

1. On the AA1000APS (2008)1 principles of inclusiveness, materiality and responsiveness on which we are required to express limited assurance

Based on our work performed, nothing has come to our attention that causes us to believe that Eskom’s assertions regarding its alignment with the AA1000APS (2008)1 principles of inclusivity, materiality and responsiveness, described on page 20, is not fairly stated, in all material respects.

2. On the selected key performance indicators on which we are required to express reasonable assurance

In our opinion, the selected key performance indicators for the year ended 31 March 2011 are fairly stated, in all material respects, in accordance with the GRI G3 Guidelines.

3. On Eskom’s self-declaration on the GRI G3 B+ Application Level on which we are required to express limited assurance

Based on our work performed, nothing has come to our attention that causes us to believe that Eskom’s self-declaration of a B+ Application Level is not fairly stated, in all material respects, in accordance with the GRI G3 Guidelines.

Comparability
This report includes the provision of reasonable assurance on unit capability factor, energy availability factor, energy losses (transmission and distribution), internal energy efficiency (non-essential energy consumption), low and intermediate level radioactive waste generated, demand-side management (annualised gigawatts) and B-BBEE expenditure company (attributable spend, attributable spend percentage and attributable black women-owned spend). We were not previously required to provide assurance on unit capability factor, energy availability factor, energy losses (transmission and distribution), low and intermediate level radioactive waste generated, demand-side management (annualised gigawatts) and B-BBEE expenditure company (attributable spend, attributable spend percentage and attributable black women-owned spend). We previously provided limited assurance on internal energy efficiency (non-essential energy consumption) and B-BBEE expenditure company (top 295 suppliers).

Limitation of liability
Our work has been undertaken to enable us to express the conclusions on the selected sustainability information to the directors of Eskom in accordance with the terms of our engagement, and for no other purpose. We do not accept or assume liability to any party other than Eskom, for our work, for this report, or for the conclusions we have reached.

KPMG Services (Pty) Limited

Per PD Naidoo
Director
Johannesburg
31 May 2011

AH Jaffer
Director
Johannesburg
31 May 2011

85 Empire Road
Parktown
2193

1. AA1000 AccountAbility Principles Standard (2008), issued by AccountAbility

Eskom Holdings Limited Integrated Report 2011