

State of the Power System Update

Eskom

24 May 2012

- This **winter will be different in that generation maintenance will be done** and not deferred. Eskom is committed to maintaining at least 9 generation units between April and August to ensure the long-term sustainability of the plant.
- There is **sufficient capacity to meet the demand most of the day**. The **concern is the peak demand between 5pm and 9pm**. If that can be reduced by as much as 2000MW, the security of electricity supply will be adequate.
- Residential customers, particularly those that use **geysers, space heating and pool pumps** can make the biggest difference by switching off this equipment for 4 hours and will **yield more than 2000MW savings**.
- Eskom has completed a 5 year review of its maintenance requirements to create a sustainable generation fleet. It is committed to doing the maintenance that will ensure a **sustainable generation fleet to meet the long term supply requirements for country**.
- In the **short to medium term**, this will introduce risks to balancing supply and demand. In order to manage these risks, the country must continue to focus on additional supply options, **energy efficiency and some form of mandatory energy conservation schemes**.
- Eskom is **committed to completing the new build programme** and is putting the necessary resources in place to do so.

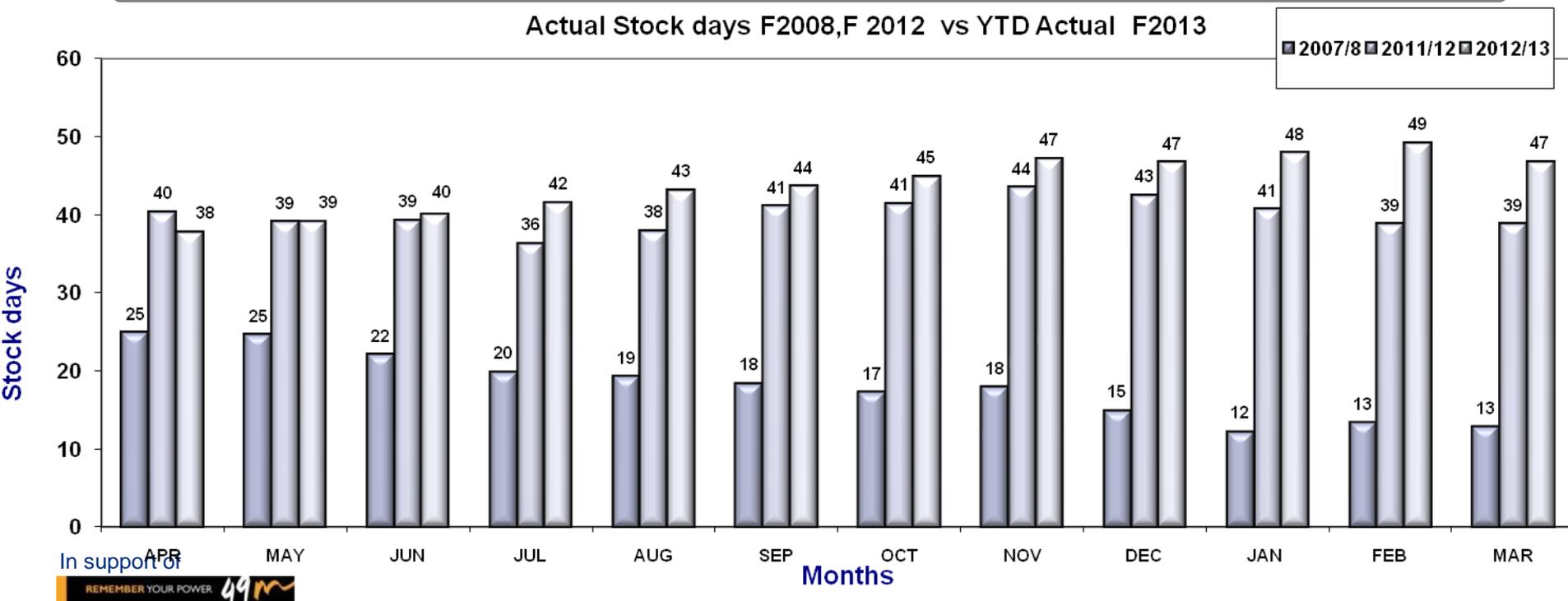
- We kept the lights on during summer, as we have done for the past five years
- Going into winter, we face new challenges: Eskom cannot do it alone
- Our power stations are ageing and are being run hard. Sustained high levels of planned maintenance are needed to ensure reliable performance
- The power system has been particularly tight and planned maintenance was impacted during 2013 due to:
 - The failure of a transmission line from Mozambique due to flooding, which reduced imports from Cahora Bassa – 850 MW
 - The unplanned outage of Koeberg Unit 1 – 900MW
 - The need to manage the impact of the strike at Exarro's coal mines – 1000MW
 - Volatile power station performance
- We kept the lights on in summer using Open Cycle Gas Turbines and demand side measures, but planned maintenance had to be reduced
- Eskom usually reduces maintenance to the minimum in winter so that we can meet higher demand. But this winter is different – planned maintenance cannot be deferred
- Demand during winter evening peaks can jump by up to 3000 MW in 1 hour, as households switch on lights, heaters and cookers
- Please help us **Beat the Peak** : switch off non-essential appliances from 5-9pm

- We have reached a point where we cannot continue to defer planned Generation maintenance any longer because this could have severe consequences.
- The performance of Eskom's own Generation fleet is volatile and that of the Cahora Bassa scheme has become unpredictable.
- The Multi-Year Price Determination 3 (MYPD3) determination adds to the challenge of managing a tight power system by reducing Eskom's ability to procure additional demand and supply side levers.
- We will implement a Generation maintenance strategy which is based on an 80% Availability; 10% Planned maintenance and 10% Unplanned outages over 5 years to maintain the current fleet, meet environmental requirements and achieve predictable performance from our existing assets.
- Much of the planned maintenance will be fixed, providing certainty for planning, while outages will be done to ensure we can comply with Environmental legislation
- Additional supply and demand side options must be explored to meet medium term electricity demand.

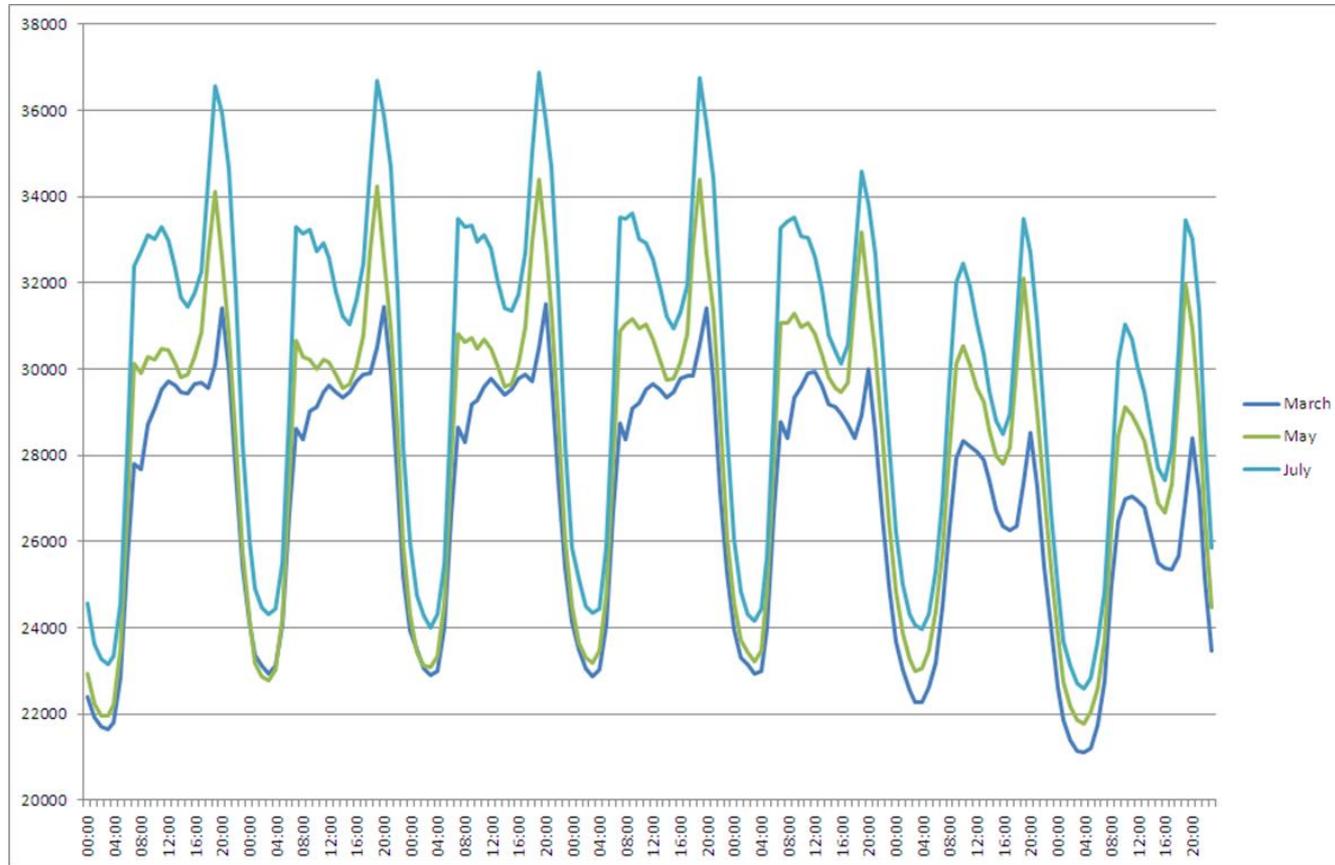
Coal stocks at high levels despite labour unrest

- Coal stock days are currently at 47 days (26 March).
- Stock days peaked at 49 days at the end of February (the highest ever), but were reduced by the three-week Exxaro strike which impacted Matla, Arnot and Matimba Power stations
- The impact of the strike was well-managed – but capacity from affected power stations was reduced by as much as 1000 MW during the day to conserve stockpiles, reducing space for planned maintenance on Eskom's generation fleet
- In support of road safety, trucking operations were halted during the Easter weekend

Actual Stock days F2008, F2012 vs YTD Actual F2013



Winter Plan 2013 – Typical Demand Profile



Going into winter, demand can spike by more than 3000 MW during evening peak – equivalent to five units of a large power station

- Cahora Bassa had returned to 1300 MW by the last week of April 2013 and the final 200 MW is expected to be restored by the third quarter of 2013.
- Koeberg Unit 1 returned to service towards the end of April
- Planned maintenance outages over the peak winter period (June-July) are approximately 2000 MW. This is maintenance work that cannot be deferred
- There is an intense focus on reducing the level of unplanned outages to below 4500 MW. This has been achieved in the last two weeks.
- Peak demand this winter is forecast at 36.8 GW, slightly lower than in 2012, but this is the average for an hour – the “peak within the peak” can go as high as 37 GW – 38 GW
- We have supply and demand side initiatives in place – but we are concerned about the impact which the NERSA tariff decision could have on our ability to finance the demand side measures needed to manage a tight system
- Approximately 2100 MW of Interruptible demand, for up to two hours a week, is available from the BHP Billiton aluminium smelters to help manage the frequency of the power system

This represent one hour with highest peak demand in a week

				6500/4500 MW Unplanned Plant Unavailability
Date	UCLF	Planned	Forecast	Shortfall Including Operating Reserves and Gas
22-Apr-13 Mon	6500	3944	31862	Yellow
29-Apr-13 Mon	6500	5302	32026	Red
06-May-13 Mon	6500	4810	32714	Red
13-May-13 Mon	6500	4560	33020	Red
20-May-13 Mon	6500	3738	33495	Red
27-May-13 Mon	6500	3738	33698	Red
03-Jun-13 Mon	4500	2450	34867	Yellow
10-Jun-13 Mon	4500	2450	35216	Yellow
17-Jun-13 Mon	4500	2564	35167	Yellow
24-Jun-13 Mon	4500	2084	35344	Yellow
01-Jul-13 Mon	4500	2579	35989	Orange
08-Jul-13 Mon	4500	2579	36510	Red
15-Jul-13 Mon	4500	1986	36885	Orange
22-Jul-13 Mon	4500	1411	36574	Yellow
29-Jul-13 Mon	4500	1240	36583	Yellow

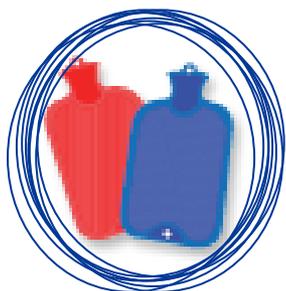
- April 2013 to 31 July 2013, the system will be extremely tight
- This winter will be different to previous winters as Eskom will have to perform long duration planned maintenance during the coldest months
- There will be an intense focus on managing the unplanned outage level (UCLF) to below 4500MW in April and May
- There is some flexibility to defer maintenance but this would increase the maintenance backlog.
- An Energy Conservation Scheme is needed to protect the system

“Beat the Peak” - Four Hours, Four Steps



- Saving electricity reduces pressure on the grid and cuts your electricity bill and South Africa’s carbon emissions
- Evening peak is between 5 pm and 9 pm – **four steps to beat the peak**

1. Switch off all geysers and pool pumps during peak
2. Switch off all non-essential lighting
3. Find alternative to electrical heaters
 - Dress warmly, and use space heaters less
 - Insulate ceilings to keep the heat in
 - Invest in thermostatically controlled heaters (fan heaters are ideal for quick heat; oil heaters for longer periods)
 - Consider gas heaters and hot water bottles
4. Respond to the Power Alert messages by switching off all appliances that are not being used



- **Switch to** energy efficient technologies: take advantage of solar water and water heating pump rebates and the residential mass rollout programme, which provides a range of free products

- The power system has been very tight during summer because of reduced imports and high levels of unplanned outages, including Koeberg Unit 1, and this has meant less space to do the maintenance work we had planned
- Going into winter, Eskom will for the first time plan to do extensive maintenance work, even during the coldest months, to improve reliability
- Our teams are preparing contingency plans to manage the impact of any severe weather events – as they did last winter
- We urge all customers to reduce demand, particularly over evening peak from 5pm-9pm
- We have done a comprehensive review of the five year maintenance plan required to ensure our power stations can deliver more sustainable performance.
- We have put initiatives in place on the supply and demand side – but are concerned about the impact of the tariff decision on these
- An Energy Conservation Scheme or similar measures is needed as a safety net
- We are determined to keep the lights on for South Africa – but Eskom cannot do it alone

Thank you