

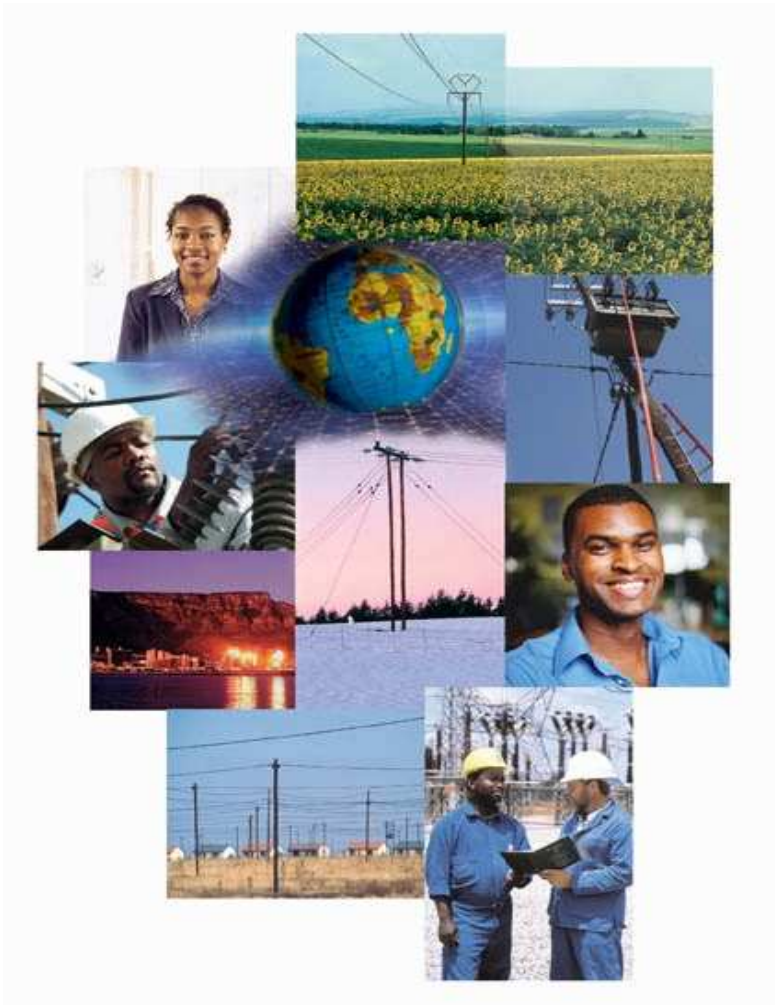
# Proposal to Manage the National Energy Emergency

## Large Power Users

# Presentation Overview

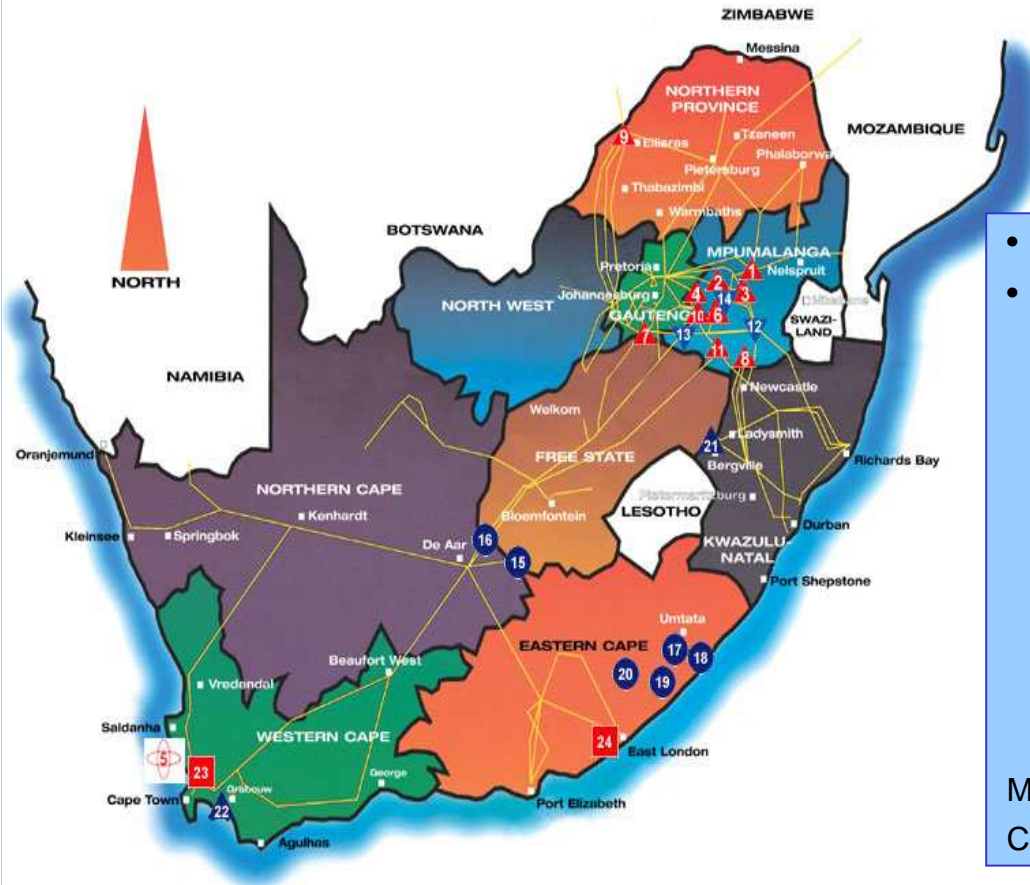
---

- National
  - Current Situation
  - National Response Plan to the South Africa's Electricity Shortage
  - National System Stabilisation Program
  - Build Programme
  
- Western Region
  - National System Stabilisation Program
  - Demand Side Management
  
- Conclusion



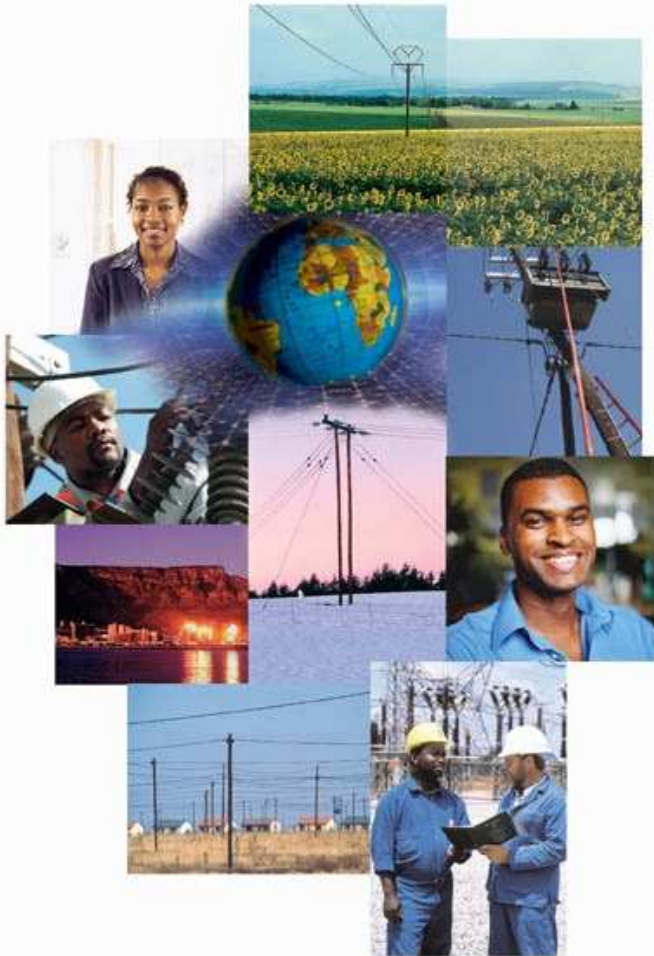
# National Capacity

# Eskom National Generation Resources and Imports



- Total operational generation capacity = 38 168 MW
- Spread across 24 power stations
  - Base Load Capacity
    - 32 976 MW Coal Fired (11)
    - 1800 MW Nuclear (1)
  - Peaking Generation
    - 600 MW Hydroelectric (6)
    - 1400 MW Pumped Storage (2)
    - 342 MW Gas Turbine (2)
    - 1050 MW OCGT (2)

Maximum Imports from Cahorra Bassa is 1740 MW  
 Current supply side options of 39 908 MW

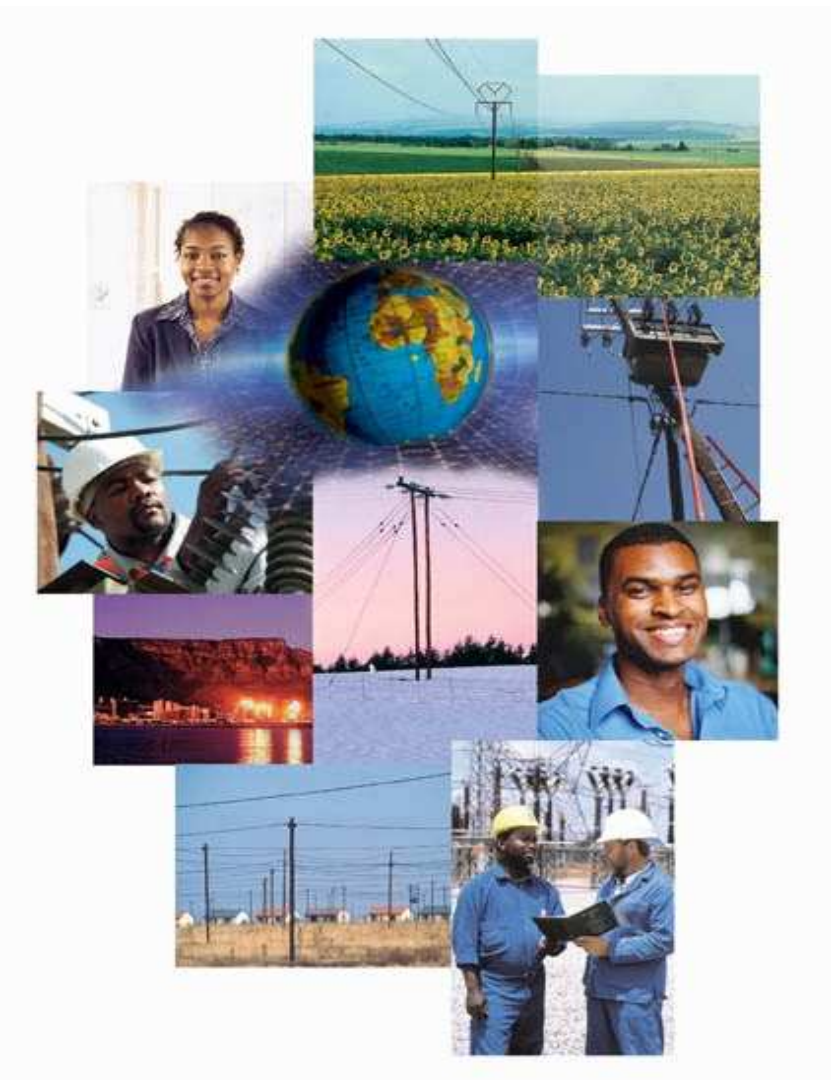


**What led to  
current situation?**

# What led to current situation?

---

- Late start of the New Build Programme
- Insufficient reserve margin
- Demand growth – 50% increase from 1994 to 2007



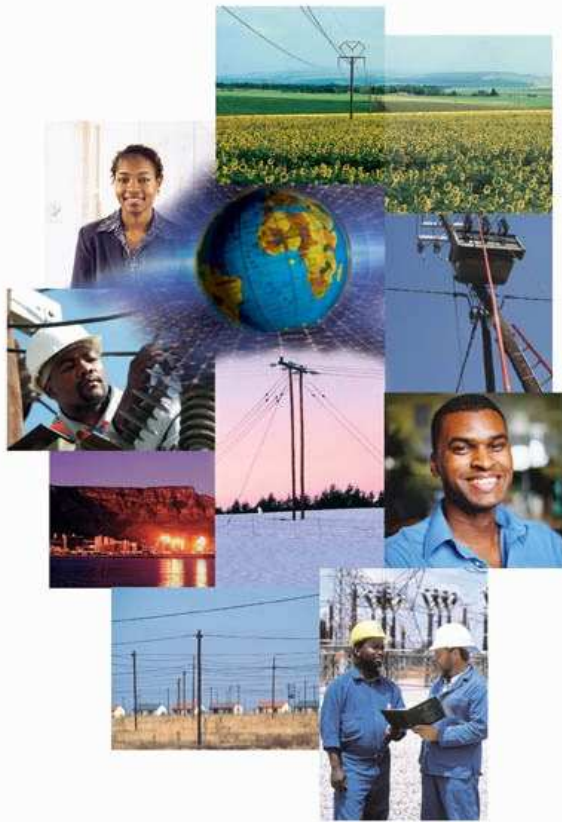
# Current Challenges

# Challenges

---

- Our reserve margin is currently 8–10% against an aspiration of 15%
- Power stations are being run harder
- A number of generation units in ‘mid-life’ requiring major planned maintenance and refurbishment
- Coal quality and Coal Transportation





# Response to Supply Challenges

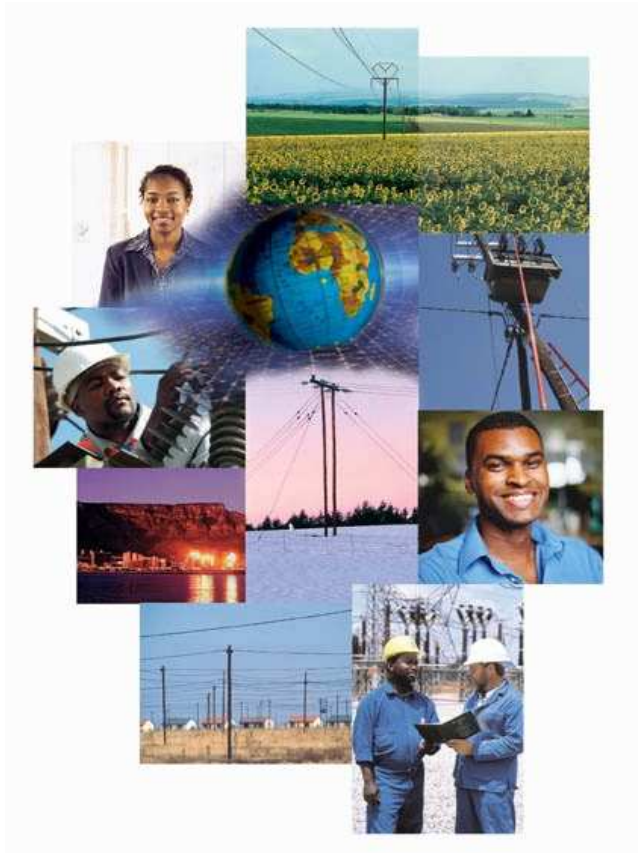
## *Results*

*The system is more vulnerable to unplanned events  
Increased probability of power interruptions  
and load shedding*


# Key Response Strategies

---

- Maintaining and improving current levels of plant performance
- Accelerated Build Programme from R97bn to R300bn to ensure sufficient generation and transmission capacity to supply future needs of the country
- Increased Demand Side Management target of 3000MW by 2008-2010



# National System Stabilisation Programme



---

# Phase 1: System Stabilisation Outcome and progress

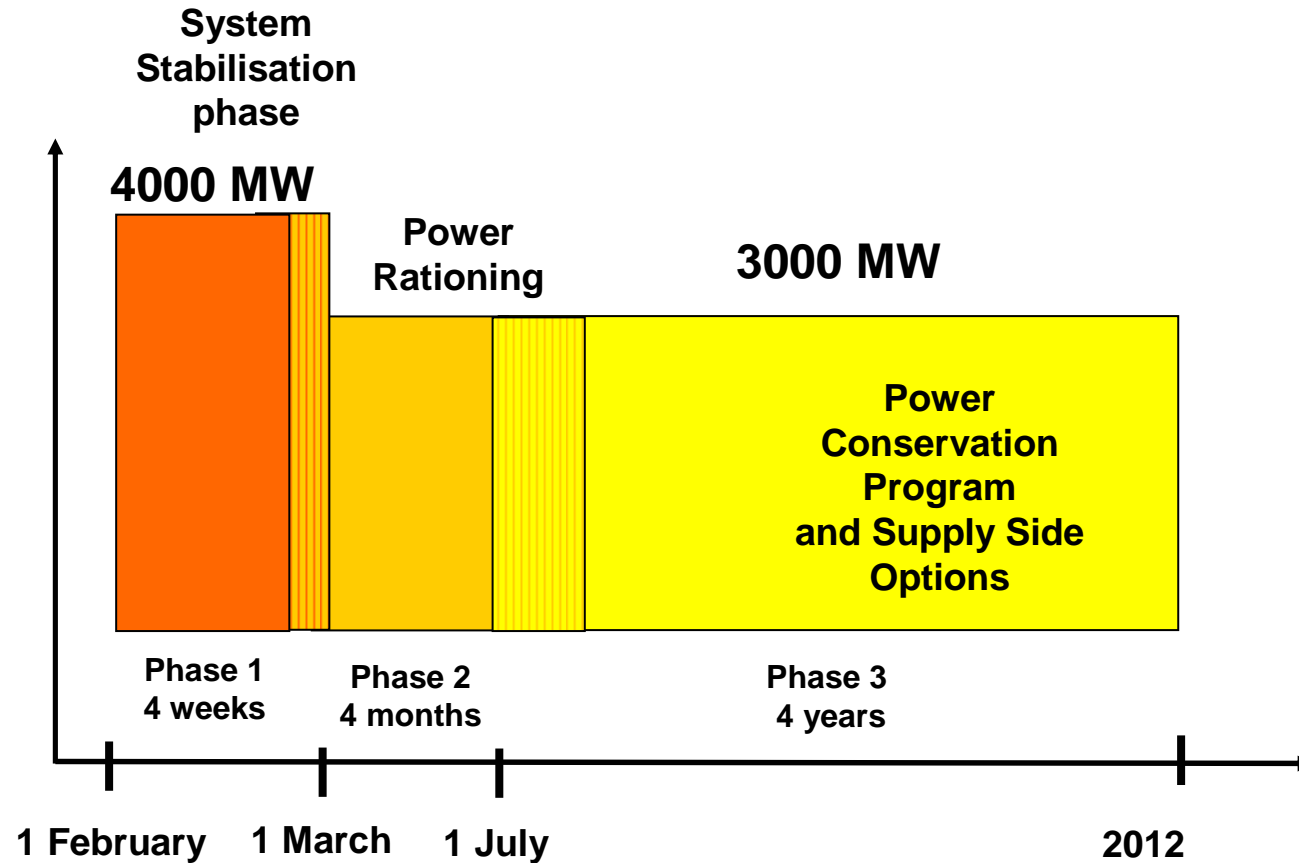
Outcome of load reduction response  
Progress on supply side

## Demand Side Progress during the Stabilisation Phase

---

- Reduction by large industrial customers
- Limited response from commercial customers
- Very limited response from residential customers

# Current load reduction progress





---

# Phase 2: Power Rationing

March 2008 to July 2008

# Key Aspects of the Power Rationing Phase

---

- Need a total 3000 MW reduction from everyone
  - Savings required in both energy and demand
  - Achieved savings from Key Industrial Customers
  - Now need load reduction from everyone else
  - If not achieved, scheduled load shedding will be embarked upon
- Emergency load shedding will be used only if required for power system stabilisation
- The power rationing phase will end on 1 July

# Load Shedding: Scheduled Load Shedding

---

- **Critical loads** will be exempt from scheduled Load Shedding if selectively switchable
  - However, they will be required to meet 10% load reduction targets

# An Incentive to Save

---

- Baseline for determining the savings Municipalities is the forecasted demand for 2008 including growth
- KIC, Municipalities and high voltage industrial / commercial customers that are not embedded in the distribution networks can apply for exclusion from load shedding once the required savings are achieved
- If savings is not sustained, will go back on load shedding schedules

# Load Shedding: Key Principles

---

- Maintaining **Network Stability**
- Minimise **Safety** risk
- Strive for **Equitable Contribution** to load shedding requirements
  - within Eskom customer segments
  - between Eskom Regions
  - between Eskom and Municipal customers
- Strive to accommodate **Customer Needs** where technically feasible
- **Minimum Disruption** to customers and community
- **Predictability** of disruption

# Load Shedding: Emergency Load Shedding

---

- **Critical loads** will be exempted from emergency load shedding (if technically possible)
  - However, they will be required to meet committed load reduction targets
- **Period** of Load Schedules
  - Covers a **24 hour period**
- Only the **required amount** will be shed : National Control will specify



---

# Phase 3: Power Conservation Programme

July 2008 until 2012

# Objective of Power Conservation Programme

---

- To institutionalise power rationing and sustain the targeted saving

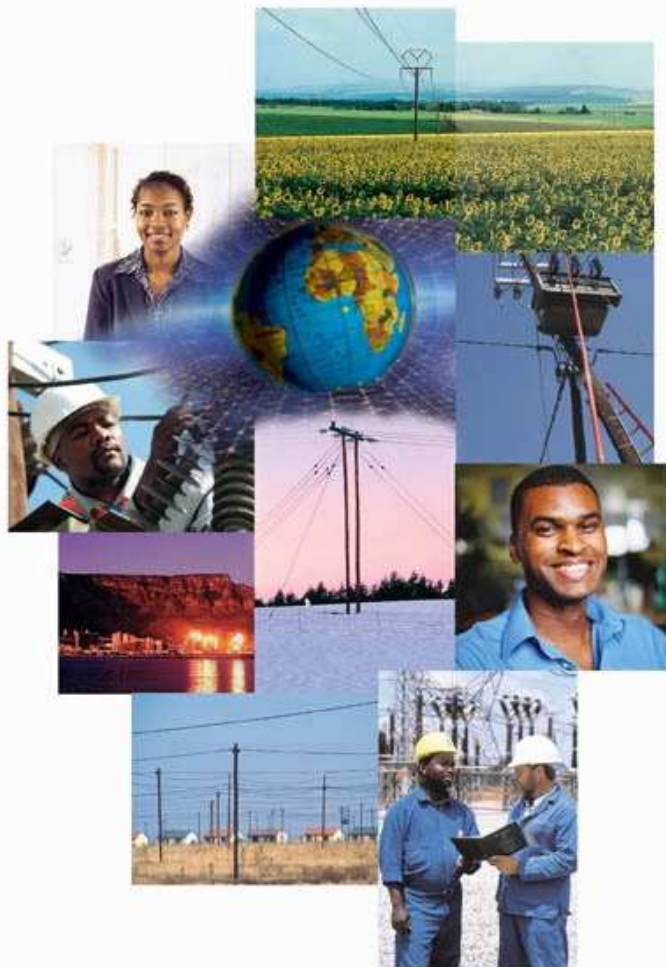
# Key components of a Power Conservation Programme

---

## Institutionalised Rationing Scheme

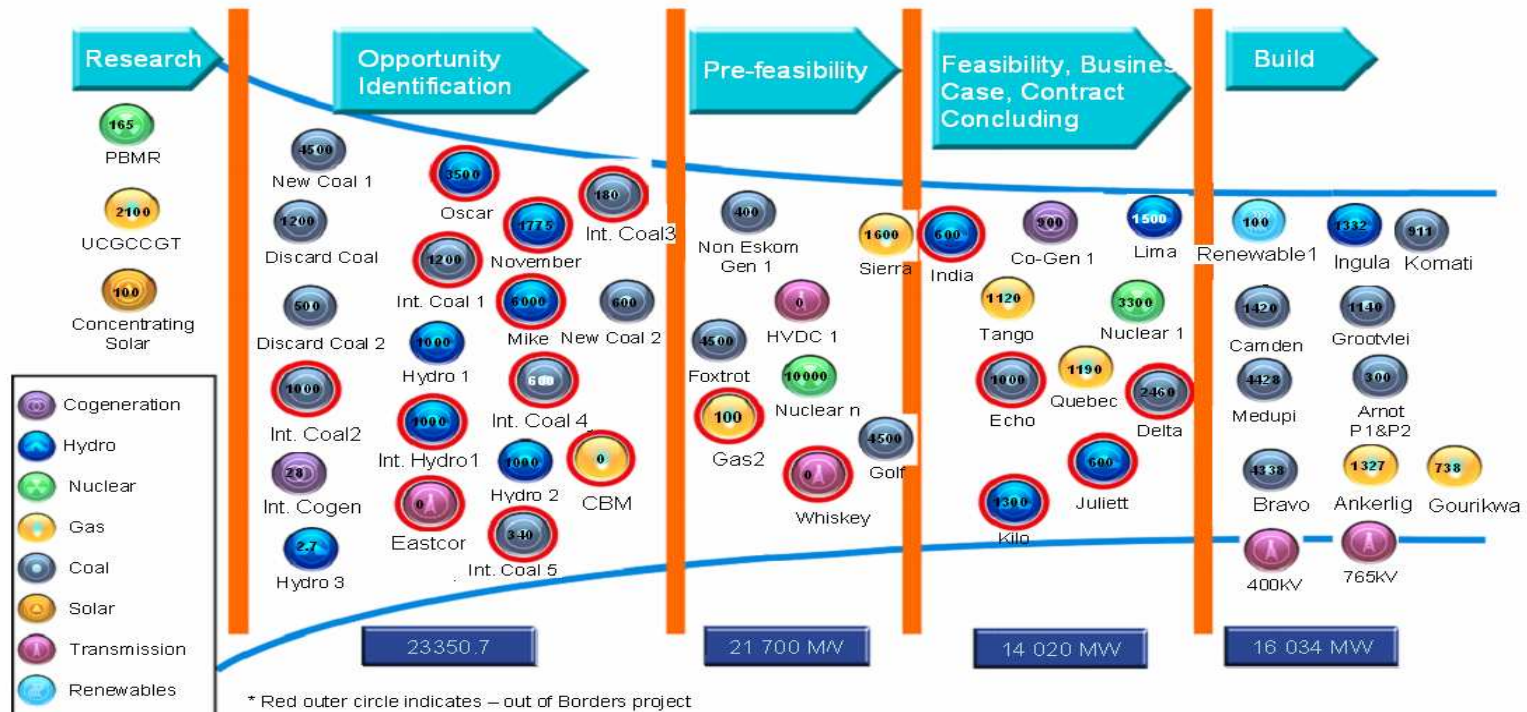
- Overall savings target
- Baseline consumption, quota allocations and implementation dates per consumer sector
- Administrative rules for dealing with objections
- Penalties and sanctions for exceeding allocations
- Incentives for savings achievements in excess of target
- Mechanisms and rules for trading unused portions of allocations

**Need to look at the practical implementation of this within the time frame**



# Build Programme

# Eskom Build Programme



# Capacity Expansion Progress

---

- Approved construction for 16 000MW
- Approved generation projects of R204 billion
- Approved transmission projects of R15,5 billion
- Planned distribution projects of R25 billion
- Capital expenditure since 2004 of R37,5 billion

## What is Eskom doing in the Medium Term:

The following moth-balled Power Stations are currently being recommissioned:

Station Name	Type	Size (MW)	Planned completion	Location
<b>Camden</b>	<b>Coal</b>	<b>1552</b>	<b>2008</b>	<b>Ermelo</b>
<b>Grootvlei</b>	<b>Coal</b>	<b>1200</b>	<b>2009</b>	<b>Balfour</b>
<b>Komati</b>	<b>Coal</b>	<b>955</b>	<b>2011</b>	<b>Middelburg</b>

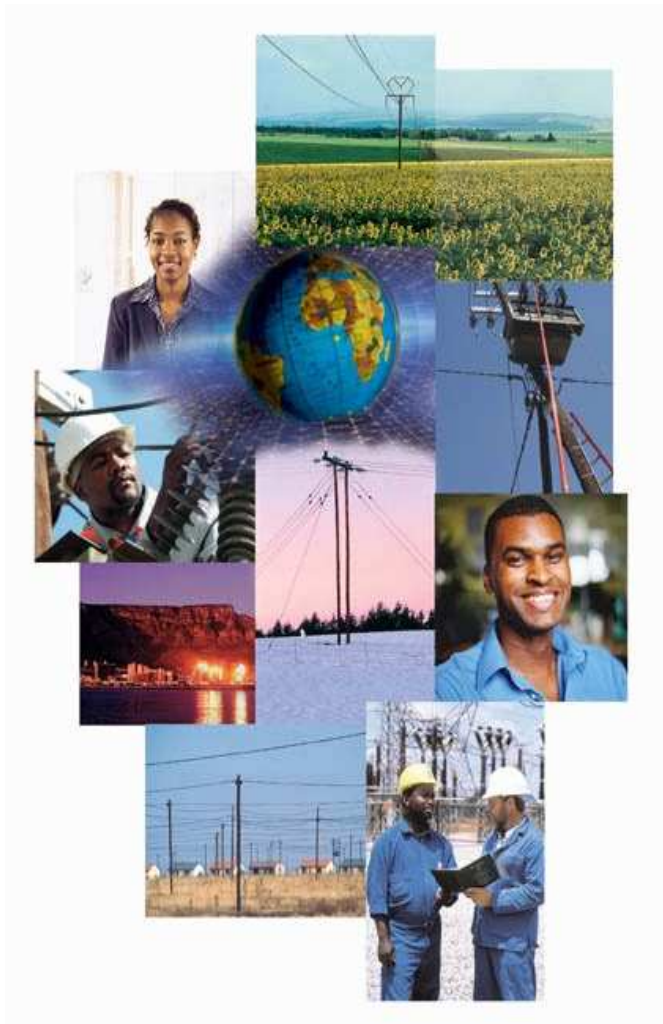
The following new Power Stations are currently under construction:

Station Name	Type	Size (MW)	Planned Start of Production	Location
<b>Ankerlig</b>	<b>Gas Turbine</b>	<b>5 X 150</b>	<b>2009/2010</b>	<b>Atlantis</b>
<b>Gourikwa</b>	<b>Gas Turbine</b>	<b>2 X 150</b>	<b>2009/2010</b>	<b>Mossel Bay</b>
<b>Medupi</b>	<b>Coal</b>	<b>4788</b>	<b>2011 - 2015</b>	<b>Lephalale</b>
<b>Ingula</b>	<b>Pump Storage</b>	<b>4 X 338</b>	<b>End 2012</b>	<b>Van Reenen</b>

# Long Term Plans

- The following Power Stations are currently being planned:

Station Name	Type	Size	Planned Start of Production	Location
<b>Bravo</b>	<b>Coal</b>	<b>4800</b>	<b>2012 -2016</b>	<b>Kendal</b>
<b>Wind farm</b>	<b>Wind</b>	<b>100</b>	<b>2010</b>	<b>West Coast</b>
<b>Lima</b>	<b>Pump Storage</b>	<b>1500</b>	<b>2014</b>	<b>Limpopo</b>
<b>Various</b>	<b>Nuclear</b>	<b>Up to 20 000</b>	<b>2025</b>	<b>4 possible locations</b>



# Western Region

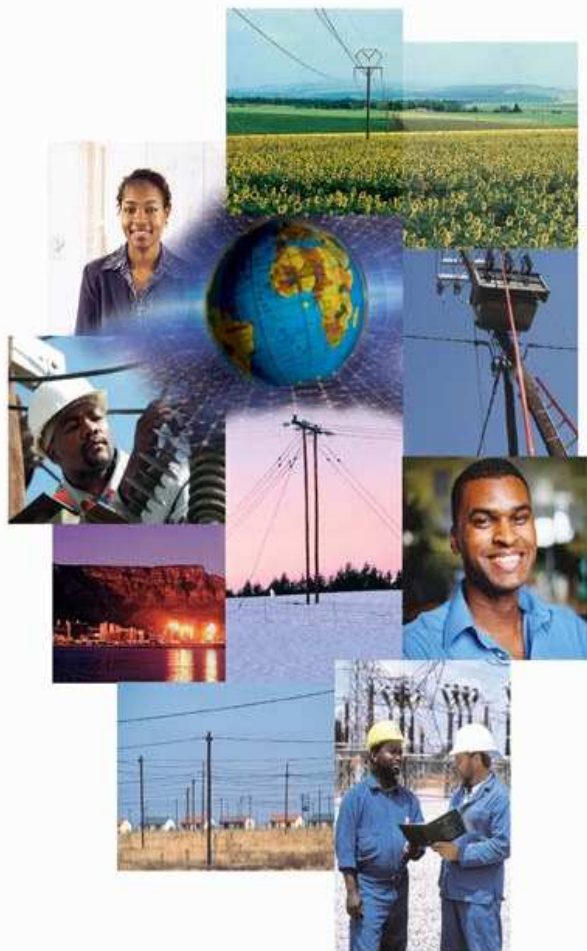
# The Challenge

---

There are **national energy constraints**. These constraints can be managed in two ways. You can address this through **managing demand** or **supply**

For the Cape we would like to focus on the demand side option **starting with a 10% saving on consumption**. Given our previous experience in DSM, we would like to propose a minimum **saving of 400MW** for the Province

We would like to ensure that this saving if achieved, will to a limited extent exempt the Province from load shedding

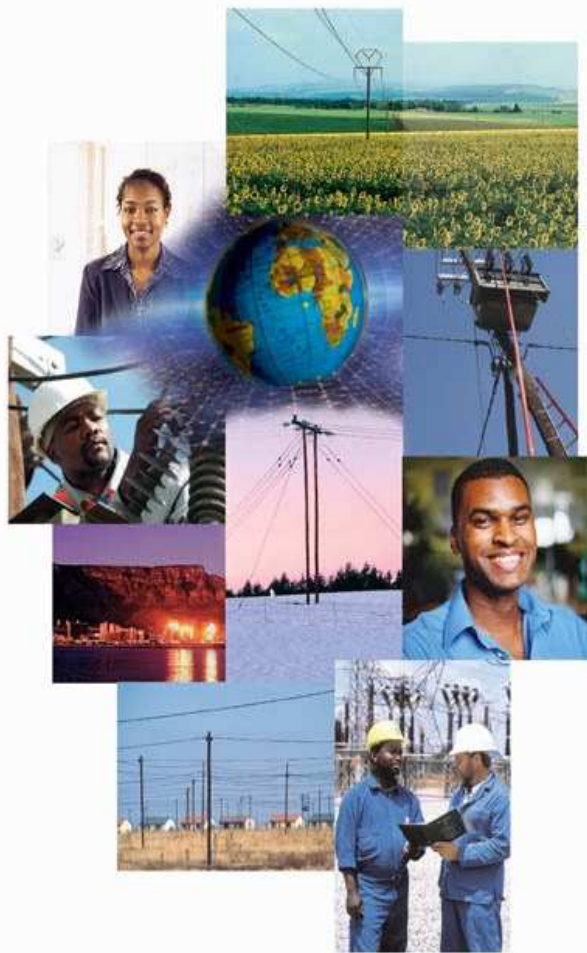


# Regional System Stabilisation Programme

# Regional System Stabilisation Plan

---

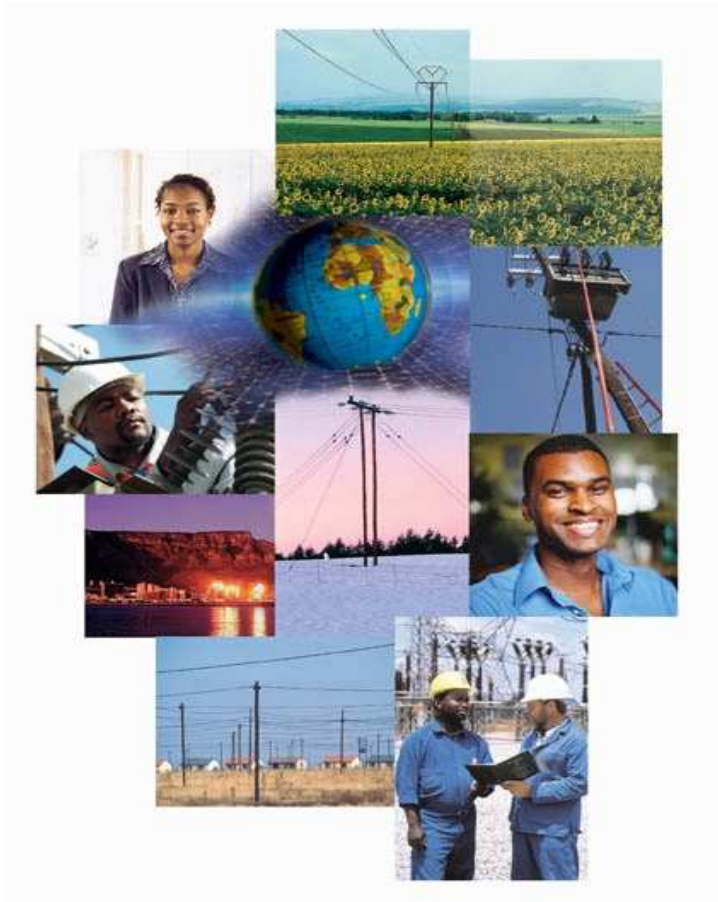
- Regional System Stabilisation Plan
  - Phase 1 – System Security (Feb-Mar 08)
    - Request for voluntary reduction
  - Phase 2 – Power Rationing (Mar-Jul 08)
    - 400 MW reduction requested
  - Phase 3 – Power Conservation (Jul 08- 2012)
    - 400 MW reduction requested
    - Investigating short lead time generation options



# Demand Side Management Programme (DSM)

# DSM Opportunities

- Residential
  - Efficient lighting initiative
  - *Residential hot water load control\**
  - Cooking
  - Aerated shower heads and geyser blankets
  - Insulation of houses
  - Solar
  
- Commercial
  - Energy efficiency and load management
  - *Efficient lighting, air conditioning and water heating\**
  - Load Management
  
- Mining / Industrial
  - Process improvements
  - Compressed Air Systems
  - Efficient equipment (e.g. Motors, Pumps)
  - *Heating and Cooling\**
  - Load control systems in conjunction with dynamic pricing signals



**How can you  
contribute**

# Short Term Interventions

---

## ■ Residential

- Switch off geysers when leaving home in the morning and switch on when going to bed
- Reduce geyser temperature setting to 55-60 degrees C
- install a geyser blanket,
- insulate at least the first 1,5m of hot water outlet pipes and 1 meter of the cold water pipes,
- use less hot water,
- install a solar water heater,
- install aerated shower heads to minimize hot water consumption
- use compact fluorescent lights lamps (CFL) instead of ordinary bulbs
- switch lights off
- use low-energy lamps for exterior lighting and
- do not install multiple lights on a single switch etc.

# Medium Term Interventions

---

These measures may require prior investigation, consultation, statutory approvals and funding

- Residential
  - Extension of geyser load management systems (e.g. ripple control)
  - Targeting reduced energy consumption in high consuming households on the tariff through restrictions or tariff penalties linked to high consumption and pricing/tariff increases
  - Actively support Eskom subsidies for Solar Water Heaters (SWH's)
  - All new houses to have:
    - SWH (Building regulations and by laws to be promulgated)
    - Load limiters and geyser load management systems to be compulsory
  - Implement Time of Use Tariffs to encourage off peak electricity consumption

# Medium Term Interventions

---

- **Commercial and Industrial**
  - Implement Time of Use Tariffs to encourage off peak electricity consumption
  - Support the roll out of Eskom DSM programmes
  
- **Renewable Supply**
  - Specifications and guidelines to be developed regarding the safe installation and use of small scale photo-voltaic and wind electricity generators
  
- **Public Lighting**
  - Roll out photo-cell controlled luminaires to stop lights burning during the day
  - Replace 80W MV with 70W HPS lights
  
- **Communication**
  - Develop a comprehensive communication focussing on savings tips and up to date information to consumers including regularly published savings targets and achievements

# What else can Businesses do?



- Make employees aware of the need to save energy
- Join the National Business Initiative (NBI) which targets a 15% saving by 2015
- Participate in Eskom's Demand Side Management programme - financial incentives for capital equipment range from 50% to 100%
- Use energy efficient motors and pumps
- Invest in **Solar Water Heating and Heat Pumps** rather than electric boilers where technically feasible

# Energy Management

---

## ➤ **10 Elements of a Successful EMP**

- ✓ 1. Secure Top Management Commitment
- ✓ 2. Appoint an Energy Coordinator
- ✓ 3. Involve Maintenance Staff in Planning and Execution
- ✓ 4. Conduct Energy Surveys
- ✓ 5. Organise Energy Data
- ✓ 6. Analyse Survey Results
- ✓ 7. Set Goals
- ✓ 8. Develop an Organisation Energy Management Plan
- ✓ 9. Implement Engineering Changes
- ✓ 10. Monitor and Evaluate Results

# Conclusion

---

- The system remains tight
- Eskom has substantially reduced unplanned outages
- Contributions by Key Industrial Customers have contributed to balancing the Power System
- Scheduled load shedding will create opportunities to improve long term plant health
- Scheduled load shedding started 1 April
- Load reductions are preferred to load shedding and all sectors have to contribute to the reduction
- Co-operation and support of all role players are required for successful and sustained implementation



---

**Thank you**