

MISSION POSSIBLE "SAVING ELECTRICITY"

Reducing Electricity Consumption

What people fail to realize about electric power is that it is consumed the moment it is created – the amount required also cannot easily be stored for later use. To guarantee its continuity, supply and demand must be perfectly balanced at all times. And, as most people know, continuous power availability is absolutely key to a successful economy.

Why must consumption be reduced?

- Currently there is a shortage in national generation capacity – at times of high load the supply cannot meet the demand, and this is likely to be the case for the next four years
- If unchecked, high electricity loads can collapse the national grid and if this is allowed to happen, it would take several days to restore the supply. This would threaten food and water supplies and will result in sanitation disasters.
- Load shedding is a drastic option and the last resort available to prevent such a grid collapse, as it disrupts business and damages the economy.

However, if excessive loads and consumption can be reduced enough, load shedding will not be necessary.

As a supplier of electricity to end users, City Power's two greatest challenges are to:

- Source sufficient power at all times from Eskom and Kelvin power stations
- Reliably deliver the power to end users by maintaining, safely operating and improving the distribution network over time to meet a growing demand.

The load problem is aggravated by modern households requiring an ever increasing amount of energy due to more appliances being used – no longer just a stove, a fridge and a kettle, but also microwave ovens, slow cookers, TV sets, DVD-players, computers, TV games, air conditioners, under floor heating and in winter, often two or more heaters and all kinds of new appliances.

Of urgent need is also the up-liftment of all members of society by eradicating energy poverty through continued electrification. New developments also need to continue to keep the economy growing. This means that we have to 'make space' and release capacity if these things are to continue.

All of these challenges are made easier if the load can be reduced or better controlled.

Producing electricity from coal

In SA we depend heavily on coal-fuelled power stations. Each kilowatt-hour of electricity generated requires the burning of about 0,7 kilograms of coal and releases about 1,1 kilograms of carbon dioxide (CO₂) into the atmosphere. So producing electricity from coal pollutes the atmosphere with Carbon dioxide which is a 'greenhouse' gas. These gases trap heat in the atmosphere and contribute to causing climate change.

If our electricity consumption is not reduced, all the country's coal will most likely be used up within 200 years. That might sound like a very long time, but in fact that is not many generations in human terms.

So, if sufficient load reductions are made, not only will load

shedding be unnecessary and the damage to the economy and discomfort of being without electricity be avoided – there is also a significant environmental benefit in it for all of us. For each consumer, in terms of simple economics – reducing consumption directly reduces the cost of energy. That in turn will reduce the impact of price increases as consumers and businesses are also constantly under threat of rising energy prices. In global terms the social impact and cost of climate change are predicted to be very high. It is time to act – what legacy will we be leaving our future generations if nothing is done now?

How can electricity use be reduced?

Simply consider the following themes:

- We need to eliminate all wasted electricity consumption
- Conservation – we need to use less or deliberately avoid using electricity
- Improve energy efficiency – get the same job done by using less energy
- Improve the load factor by 'evening out' the pattern of electricity usage
- Find alternative energy sources, preferably cleaner and renewable energy sources
- Plan ahead when developing new buildings and doing renovations to include energy efficiency investments
- Finally - we need a culture change – better energy awareness, education and attitude

Eliminating all wasted electricity consumption, for example:

- Switch off unused lights and appliances
- Don't be in two places at the same time – home and work – switch off lights and office equipment when you go home, switch off unnecessary appliances at home when going to work
- Completely switch off appliances that are often on standby – TV decoders, etc.
- Don't run air conditioners or heaters with the windows open
- Don't boil more water than is needed in a kettle or use excessive bathwater
- Install ceiling insulation and weather-sealing on windows and doors of buildings to retain heat in winter

Conservation – deliberately use less or avoid using electricity

- Use heater and air-conditioning thermostats to lessen energy use
- Dress warmly in winter instead of relying completely on heaters
- Open windows instead of running air conditioners on mild days
- Reduce the run time on swimming pool pumps to the minimum really needed
- Break the habit of switching on every piece of equipment when you reach the office
- Be aware of the link between energy and water use. The cost of water purification and pumping is very high in the Johannesburg region because of the geography.

Energy efficiency – get the same job done using less electricity

- Use appliances efficiently – use the washing machine only when it has a full load
- When buying new appliances, look for energy-efficient units
- Make use of energy-efficient lighting – replace incandescent globes with compact fluorescent lights (energy-saving globes)
- Use efficient cooking methods – microwave where you can
- Match pot size to plate size on the stove

Improve the load factor by 'evening out' the pattern of electricity usage

The high load periods are typically between 8 and 11 a.m. as well as between 6 and 9 p.m. on weekdays. These times are when everybody tends to use electricity and creates an excessive load condition. What is needed is to rather spread out the times electricity is used

- Changing people's habits and consumption patterns
- Changing the time factories use electricity – to off-peak operations
- Batching and tuning factory production processes

Commercial and industrial consumers are encouraged to identify load-shift opportunities and apply to convert to the time-of-use tariffs.

Find alternative energy sources – preferably cleaner or renewable energy sources

- Switch to gas for cooking, particularly in areas with gas infrastructure
- Consider bottled gas cookers in other areas, it is far more efficient to have the flame to heat the pot right at the pot instead of at the power station
- Use ethanol gel fuel stoves, as this is a renewable fuel source and is safer than paraffin
- Install solar water heating systems wherever feasible
- Consider solar photovoltaic panels and inverter systems to provide power for charging batteries to run essential lighting and radio or television sets during outages
- Businesses can identify the minimum lighting, appliances and equipment needed to continue servicing their clients and use UPS equipment or standby generators to power these loads only during outages.

Plan ahead – new buildings and renovations

Include energy-efficiency designs in plans for all new buildings. Use "green building" practices wherever possible, such as

- Correctly orientating the building
 - Use of natural lighting
- #### When renovating buildings, find the opportunities to:
- Implement energy-efficiency, lighting and air-conditioning
 - Provide alternative energy sources such as gas and solar water heating
 - Design wiring to separate essential services from overall supplies in high-rise buildings – separate elevator, water pumping and emergency lighting circuits as only these 'essentials' need back-up generator supply.

Change culture – better energy awareness, education and attitude

- Treat electricity as a valuable resource – use it responsibly!
- Understand and apply all of the above-mentioned concepts and implement them!
- Know how much electricity different appliances use and understand that consumption also depends on the amount of time the appliance is used.
- Include energy efficiency as part of school curricula
- Convert to pre-paid metering systems, take note of the daily meter readings to manage consumption
- Lastly - non-payment and theft of electricity has no place in an 'energy-smart' society

