

What is it like to be an Energy Manager in a Country that has no regional support body

By: William Cass
Energy Manager
FirstRand Bank
South Africa

For the International Energy Agency
EMAK Workshop
26 January 2010
Item 2-2



FIRSTRAND

Agenda

1. Structure of energy in South Africa
2. Background of energy efficiency in South Africa
3. Where are we going in South Africa
4. Government and Industry co-operation
5. How does this impact the rest of Southern Africa
6. What is required in Southern Africa
7. How can EMAK assist with Energy Efficiency in Southern Africa



Structure of Energy in South Africa

Control

- State power monopoly, **Eskom** controls the generation, transmission and distribution of electricity in South Africa.
- Trade is split between Eskom and local government

Plant mix

- Coal-fired base load power stations 34 294 MW
- Nuclear 1 800 MW
- Hydro 600 MW
- Pumped Storage 1 400 MW
- Gas-fired (OCGT) 2 409 MW
- Wind Energy 3,2 MW

Total electricity capacity 40 506 MW

New Build Programme

- Coal-fired base load power stations 2 x 4 800 MW power stations to be completed by 2012 to 2015

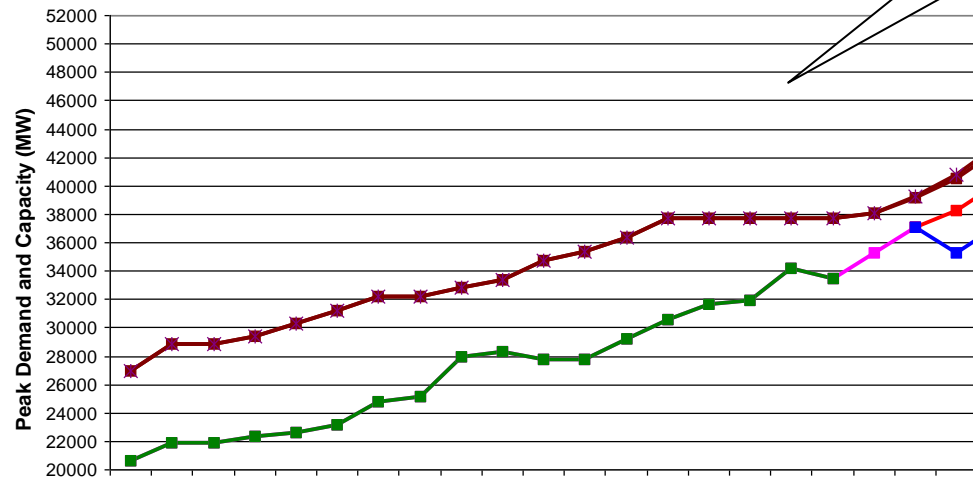


Structure of Energy in South Africa

Independent Power Producers (IPP's)

- Eskom has signed no contracts have been signed with IPP's (including co-generation). It is estimated that once contracts are signed, many would take 30 months to generate electricity. There is an estimated 4 000 MW that can be produced by IPP's
- Feed in tariffs (renewable energy) have been created but again, no contracts have been signed with Eskom due to funding issues.

Electricity Supply & Demand with forecasts



Expected 3 000 MW
load reduction
through penalties and
incentives



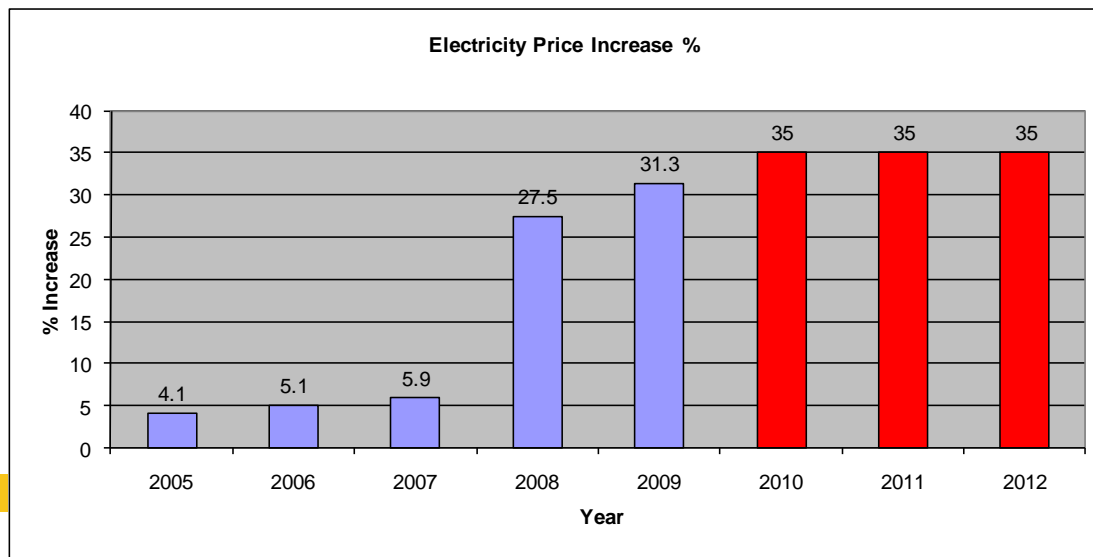
Background of Energy Efficiency in South Africa

Pre-January 2008 Power Outages

- South Africa had excess electricity for decades and large industrial companies (like aluminum smelters) were enticed to set up shop in South Africa
- There was very little energy efficiency focus in South Africa.
- Electricity in South Africa was one of the cheapest in the world with no incentive to save

January 2008 Power Outages

- In January 2008, South Africa was crippled by scheduled power outages
- This was due to bad management by Eskom and lack of planning by Government
- Most areas were cut off for two hours, three times per week.

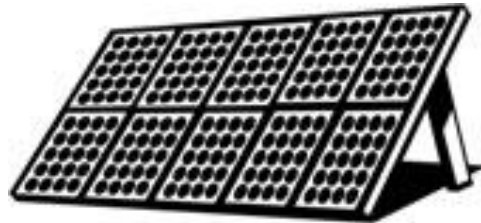


Background of Energy Efficiency in South Africa

Power Outage impact on Business and energy efficiency

- Mines were forced to cut 10% consumption or be cut-off.
- Large industrial companies were subsequently included to reduce electricity
- No new projects that consumed above 100 KW were allowed to proceed. New connections must now prove their energy efficiency before being allowed to connect.
- Workgroups were created with government and industry practitioners to work out a way to reduce electricity consumption. These were presented to Parliament
 - Several financial incentives were planned, with some being implemented in 2010
 - Penalties were planned for not reducing electricity to specified levels but due to the possible impact to business and job losses, this has been put on hold.
 - These workgroups have subsequently stopped

The Power Outages were the real birth of energy efficiency in South Africa



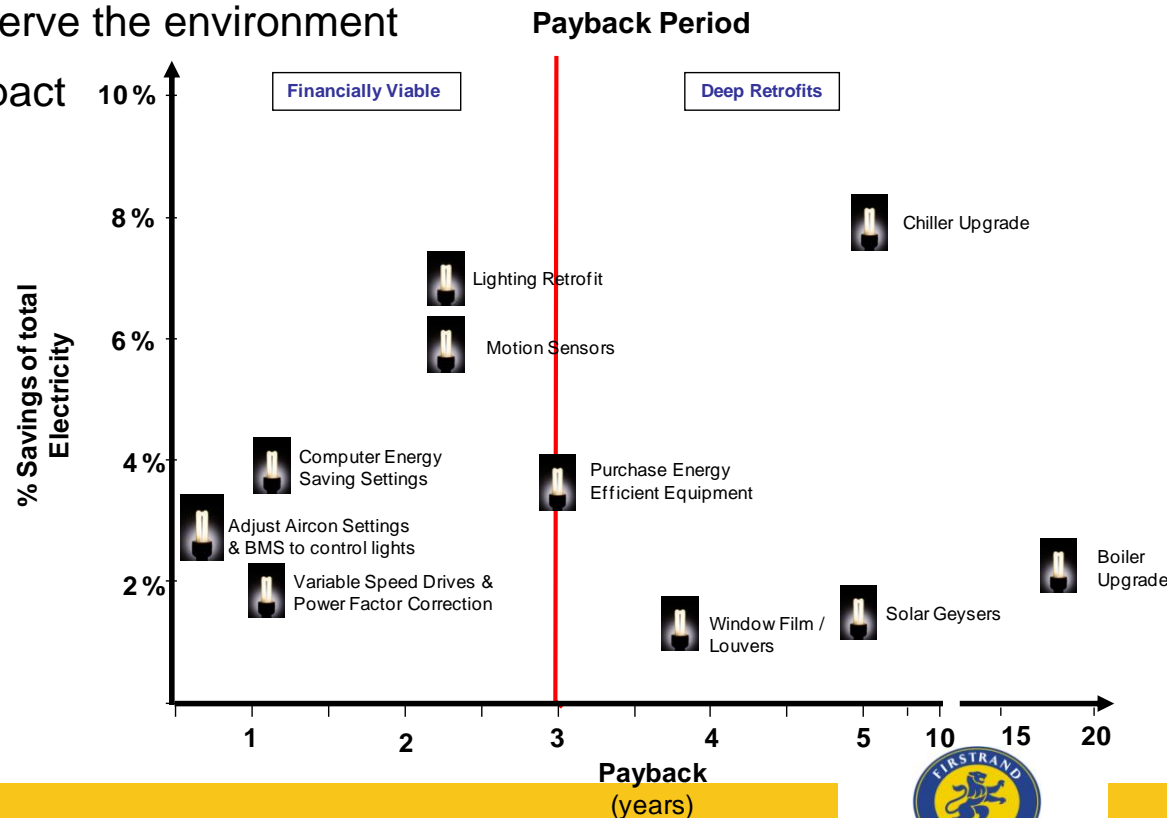
Background of Energy Efficiency in South Africa

Universities, Research Institutions & Programmes

- Most research institutes and Universities do not have funded programmes and have to provide a consultancy service to fund research.

Energy Efficiency, why now?

- Price of electricity has increased dramatically and will continue to do so.
- Global and local pressure to conserve the environment
- Visible signs of environmental impact
- Avoid future power outages
- Return on investment is feasible



Where are we going in South Africa

If the status quo continues

- South Africa are already back to pre-recession electricity consumption volumes
- Instead of reducing consumption, Eskom would rather increase tariffs
- Eskom will continue to build coal-fire power stations and increase carbon emissions.
- Will not reach the target of 1 million solar water heaters by 2014
- Households and business are unaware of how close electricity supply and demand are.
- No IPP's or Renewable energy projects will feed into the grid.
- Power outages in 2011- 2014
- Only 15 Clean Development Mechanism (CDM) projects have been registered by the CDM Executive Board as CDM projects. Four projects have been Issued with CER's

If we change our mindset

- Focus on energy efficiency – much cheaper than power stations
- Partner with business to roll out solar water heaters
- Communicate to consumers on how critical the electricity situation is.
- Contract with IPP's or Renewable energy projects as a matter of urgency
- While it lasts, South Africa must use the CDM funding that is available and skill up resources to implement and measure these projects



Government and Industry

Hurdles

- Eskom have a conflict of interest acting as generator of electricity and energy efficiency
- Eskom and Local Government lose revenue if supply is not close to demand
- Industry and public don't believe Eskom when they say large increases are required as new power stations need to be built as a matter of urgency. This is due to Eskom supplying different messages to different audiences.
- Industry and Government energy efficiency workshops have stopped due to change of leadership in Government .
- IPP's and renewable energy projects are frustrated with lack of progress in signing contracts.
- Public believe power outages are a thing of the past.



Government and Industry

How to jump the Hurdles

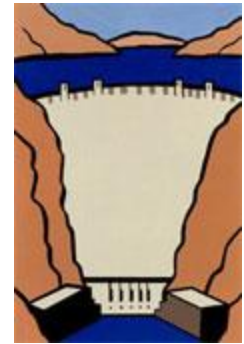
- Energy efficiency must be taken out of Eskom with relevant funding to incentivise change.
- Allow private competitors to generate, transmit, distribute and trade in electricity
- Eskom need to communicate a consistent message to all stakeholders
- Allow Industry to assist Government and South Africa in find energy efficiency solutions
- Contract with IPP's and renewable energy projects.
- Communicate how critical the situation is
- Fund research in energy efficiency



How does this impact the rest of Southern Africa

Energy Generation

- Besides Mozambique (2 075 MW from hydro-electric plant), Southern African countries have relied on South Africa to generate electricity for them.
- Now that there are supply constraints in South Africa, many are opting to generate their own electricity, using mainly coal-fired and hydro-electric.
 - Mozambique
 - 1 500 MW new hydro-electric 2015
 - 2 000 MW new coal-fired. From 2013
 - Zambia
 - 600 MW new hydro-electric 2017



Questions

- How badly will climate change impact rainfall and rivers providing hydro-electricity in the future?
- Can we get a co-ordinated approach to increasing capacity and energy efficiency and still have secure electricity in Southern Africa?

What is required in Southern Africa

Co-ordination

- between Southern African countries on electricity generation and security

Accreditation

- The accreditation body in South Africa (SABS) should not duplicate work and use tests done by other international accreditation bodies. SABS should only test for South African conditions
- We re-invent the wheel each time a new product is available in Southern Africa

Training

- Co-ordinated efforts from universities, research institutes and programmes
- “One stop shop” for case studies (currently rely on supplier and need to pilot each product)
- Best practice from around the world.
- How to implement ISO 50001 and other standards



How can EMAK assist with Energy Efficiency in Southern Africa

Energy Management is growing at a rapid pace in South Africa and will continue to grow. This is due to:

- Energy constraints
- People more environmentally conscious
- Energy is becoming expensive and it needs to be managed.

With this growth Energy Managers will require:

Networking

- To be able to network with countries that have been doing energy efficiency for years.
- Be able to discuss issues and problems with people who have been there.

Best Practices

- EMAK will have access to an enormous amount of information and case studies to assist Energy Managers in making informed decisions

Training

- Education and training supported and vetted by a network like EMAK will differentiate courses of real value with “fly by night” courses.

Bridging the Divide

- Getting government to work with industry to provide workable solutions

