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

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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 produces 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
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.
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.
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
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.
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 finding energy efficiency solutions.
• Contract with IPP’s and renewable energy projects.
• Communicate how critical the situation is.
• Fund research in energy efficiency.
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
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