Driving National Energy Efficiency Performance

Alfred Hartzenburg
Presentation Points

- Project baseline and focus
- Outcomes
- Socio-economic impacts
- Behavioural insights
- Sustainability failure
- A winning culture
Most emissions reductions are possible through the deployment of existing best available EE practices and technologies.

Energy Efficiency remains the most effective GHG emission mitigation strategy.
Commissioning of new Eskom plants are likely to be delayed further

Eskom Generation Plant Availability %

- South Africa faces the worst power crisis in 40 years.
- Power deficits are likely to persist for at least another 5 years.
- There are backlogs in maintenance of the country’s distribution networks.
- Over the last 3 years, Eskom has lost the equivalent of an entire coal power station through deteriorating plant availability.
- Of the country’s 87 coal generating units, “32 require major surgery and 3 are in a critical condition”.
- Of Eskom’s 41,000MW in total generating capacity, currently only around 30,000 MW is being pushed out of the system.
- Eskom’s generation plant availability has been in decline since the early 2000’s.
- The risk is that Eskom’s plant availability falls to 70% by 2017.

Source: Prof Anton Eberhard; BNP Paribas Securities
Industry Challenges

- Focus was production and revenue targets, not energy efficiency
- Lack of information and understanding of financial and qualitative benefits of energy efficiency
- Lack of adequate technical skills to develop and implement energy efficiency measures and projects
- Inadequate monitoring systems and poor data quality
- Belief that first cost is more important than recurring costs
- Where energy efficiency knowledge exists it very often resides with individuals rather than with the organization → sustainability risk
- Defensiveness – “I’m already doing a good job!”
- …
IEE: A Global Programme

Operational in 17 countries
Planned activities in 10 countries

Operational:
- South Africa
- Moldova
- Russia
- Turkey
- Ecuador
- Malaysia
- Thailand
- Viet Nam
- India
- Philippines
- Egypt
- Indonesia
- Iran
- Ukraine
- Colombia
- Macedonia
- Myanmar

Planned activities:

Other donors:
- Swiss State Secretariat for Economic Affairs
- UK Department for International Development
- Government of South Africa
- Government of Italy
Technology Focus

Energy Management Systems (EnMS)

- Management participation
- Management Responsibility
- Policy
- Planning
- Checking
- Implementation & Operation
- Day to day operations

EE INTEGRATED
ENERGY SAVINGS & INVESTMENTS

Energy System Optimization (ESO)

- Distribution
- End Use
- Generation
- Recovery

- Auxiliary energy systems account for over 50% of final manufacturing energy consumption
- System optimization average efficiency gains range between 15-30% against 4-5 % of individual components
## Project Outcomes

**Actual Savings Reported (2011 – June 2015)**

<table>
<thead>
<tr>
<th>System</th>
<th>kWh</th>
<th>Tonnes CO$_{2e}$</th>
<th>Rand Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>EnMS</td>
<td>901 098 200</td>
<td>857 000</td>
<td>889 608 000</td>
</tr>
<tr>
<td>ESO</td>
<td>440 524 800</td>
<td>394 000</td>
<td>237 538 000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1 341 622 000</strong></td>
<td><strong>1 251 000</strong></td>
<td><strong>1 127 146 000</strong></td>
</tr>
</tbody>
</table>
Direct Jobs Retained / Created

Solomon Coatings: Implementing energy assessment findings saved electricity and increased production output by 40%.

Sockit Mnfacturing: A steam boiler fuel switch and 4 energy optimisation projects reduced kVA enabling 30% additional machines.

Willard Batteries: Implemented EnMS, saved R3M in 2013 and as a result the plant expanded production capacity by 20%.

Mittal Saldanha: Implemented EnMS in 2010 and saved R60M in the first year. Sustained energy performance and saved R272M to date.

SA IEE Project Outcomes

<table>
<thead>
<tr>
<th></th>
<th>Retained</th>
<th>Created</th>
<th>Total</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>0</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>4</td>
<td>416</td>
<td>66</td>
<td>482</td>
</tr>
<tr>
<td>5</td>
<td>1237</td>
<td>0</td>
<td>1237</td>
</tr>
</tbody>
</table>

Total Direct Jobs Retained / Created = 1744
Local Employment Created

This slide forms the base of the majority of slides—a text box with bullets are included ready for you to type into.

Local Employment Created = 5 713

Number of jobs preserved and/or created within the local community

% of Direct jobs retained in the local area for the enterprise

80%

100%

75%

78%

Induced employment

Indirect employment

Direct employment

Local Employment*: 4 170
ArcelorMittal Saldanha Works

Local Employment*: 19
Solomon Coatings

Local Employment*: 68
Sockit Manufacturing

Local Employment*: 1 456
Willard Batteries

Local Employment:* 19

Local Employment:* 68

Local Employment:* 1 456

1 470

706

2 474

990

13

50

1

13

5

15

147

935

374

75%

100%

80%
Local Livelihoods Supported

Livelihoods supported in the local community through IEEP generated direct local employment

- ArcelorMittal Saldanha Works: 2,375
- Solomon Coatings: 12
- Sockit Manufacturing: 37
- Willard Batteries: 954

Livelihoods Supported = 3,378
Disposable Earnings Generated

Disposable annual income earned by workers living in the local community

Percentage earnings within local community

Annual income retained local community

1. R 42 000
2. R 90 000

ArcelorMittal Saldanha

Solomon Coatings

Sockit Manufacturing

Willard Batteries

Disposable Annual Earnings = R271 M
“Behaviour change can offer unique and hard to replicate competitive advantages and is necessary in a world of ubiquitous technology which can no longer be relied on to maintain a cutting edge.”

Industrial Energy Project Manager
Behavioural insights identify **extra-logical means of economic actor decision making**, such as:

- Bounded rationality, dynamic inconsistencies, prospect theory and reference points, pro-social behaviour / fairness

**Necessary and potentially low-cost** component of energy management systems (EnMS) and efficiency interventions

**Key platform** upon which to build for energy savings

Can be pursued **independently or in tandem** with technology upgrading efforts

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Dr Aurelia Figueroa


http://bit.ly/1InhUmE
Case Study: ArcelorMittal Saldanha Works

Dr Aurelia Figueroa

http://bit.ly/1InhUmE
Barriers and Catalysts of Change

**Barriers**
- Lack of urgency
- Status quo processes
- Low awareness, skills
- “No Mans Land”
  - Lack of dedicated time and financial resources, oversight
- Finance

**Catalysts**
- Burning platform
- Energy Management System
- Awareness building, training
- Employee engagement
  - Management involvement
  - Energy champions & coordinators
- Proof of concept

Dr Aurelia Figueroa
http://bit.ly/1InhUmE
I give energy saving a helping hand because: It's in my hands!
Behavioural Imperatives

- Necessity and potentially low cost of behavioural interventions; a valuable first and ongoing step
- Value of UNIDO-IEEP collaboration
- Beyond technology: Better integrate behaviour into incentive programmes and training
- Behavioural insights as a strong basis for an EnMS
- Catalyse bottom up and top down engagement, establish and build upon social norms
- Delegate time and financial resources, avoid “time poverty”
- Provide feedback, foster top-of-mind focus
- Seize windows of opportunity

Dr Aurelia Figueroa
http://bit.ly/1InhUmE
Sustainability Failure

”...energy efficiency initiatives that are not monitored and maintained typically have a **six-month half-life of their benefits**. That is, they lose half of their economic benefits every six months if left largely untouched.”

Emerson’s James Beall, a principal process control consultant who helps manufacturers optimize their processes
A Winning Culture

- Demonstrable and visible top management commitment
- An ISO / WCM environment promotes a culture conducive to sustainability
- After exhausting no cost improvements a willingness to spend in order to save
- Plant stability and reliability
- Adequate sub-metering and a measurement plan
- Allocation of resources
Beneficiaries...
Thank You

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