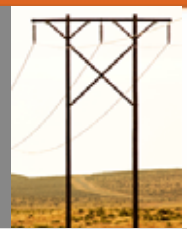
saneri
South African National Energy Research Institute
Pty (Ltd)

South African National Climate Change Response White Paper

presented by
Dr. Minnesh Bipath
4/11/2011

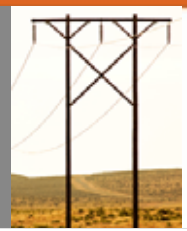
Presentation Overview



saneri
South African National Energy Research Institute
Pty (Ltd)

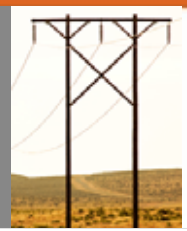
- South African National Climate change response white paper
- The South African National Energy Development Institute
- What will be needed in the form of technology transfer and financial support?

Background



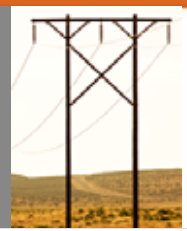
- The 2004 National Climate Change Strategy
- The 2005 Climate Change Conference
- The October 2007 draft LTMS findings
- The July 2008 Cabinet policy directions
- The Energy Act 2008 , (no. 34 of 2008)
- The March 2009 Climate Change Policy Summit
- The December 2009 UNFCCC COP 15, Copenhagen
- The May 2010 Policy Development Round Table
- The Draft Green Paper published in the Government Gazette on 25 November 2010
- The Climate Change response White paper published in the Government Gazette on 31 October 2011

The Role of the Department of Environmental Affairs



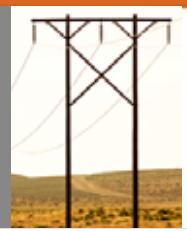
- The White Paper is Government's White Paper
- The Department has been mandated to coordinate and facilitate the policy development process
- The Department has, through the White Paper, attempted to structure key sectorial inputs into a cohesive and coherent policy

Objective of the white paper



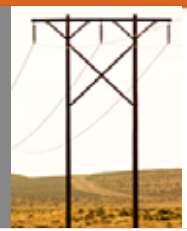
- Make a fair contribution to the global effort to reduce greenhouse gas emissions.
- Effectively adapt to climate change by promoting socio-economic and environmental resilience

Principles



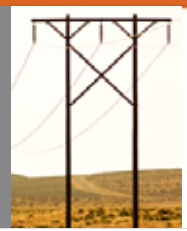
- **Common but Differentiated Responsibility**
  - Our response to climate change must be appropriate to:
    - Our state of development
    - Our actual capability
- **The Precautionary Principle**
  - A risk-averse and cautious approach which takes into account the limits of current knowledge about the consequences of decisions and actions
- **The Polluter Pays**
  - The costs of remedying environmental damage must be paid by those who caused it
- **A people-centred approach**
  - Climate Change responses should protect human dignity and be sensitive to the plight of the poor
  - Protecting the environment must complement social equity and sustainable development
- **Informed Participation**
  - Promote an understanding of climate change throughout society to encourage active participation in responses
  - Ensure that vulnerable and disadvantages people have the information they need to contribute to responses.
- **Inter-generational rights**
  - This generation must conserve the environment for future generations

Strategies



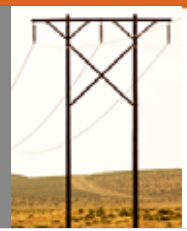
- **Balanced approach to mitigation and adaptation:**
  - Priorities
  - Focus
  - Action
  - Resource Allocation
- **Science-based Policy**
  - Develop and maintain systems to ensure that policy is informed by the latest and best scientific research on climate change
- **Adaptation to prioritise immediate threats**
  - Focus adaptation interventions on the following sectors:
  - Water
  - Agriculture
  - Health

Strategies



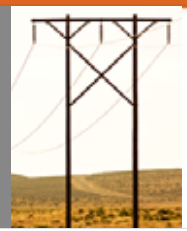
- **Emissions to peak, plateau and decline**
  - Peak 2020-25
  - Trajectory derives from work done in Long Term Mitigation Scenarios
- **Mitigation to promote development and competitiveness**
  - Prioritise interventions that create jobs, alleviate poverty
  - Promote new industrial development
  - Improve efficiency and competitiveness
  - White paper clearly identifies key industries for intervention
- **Prioritise climate change information and its dissemination**
  - Improve our ability to measure and predict climate change
  - Better understanding of extreme weather events and their impacts

Strategies



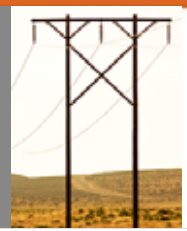
- **Mainstream climate change into all planning**
  - National
  - Provincial
  - Local
- **Use economic levers to promote behaviour change**
  - Use regulatory and fiscal measures to promote the transition to a low carbon economy
- **Government to promote mitigation in energy, transport and industry**
  - The South African economy is energy intensive and presents special challenges in terms of transitioning to a low carbon economy
  - Government to support transition in key sectors
- **Climate Change resilience a criterion for sustainable development**
  - Sustainable development is also climate-friendly development

Strategies



- **Transition from an energy-intensive, high carbon economy**
  - Responses to climate change by developed countries may threaten trade with carbon intensive economies like South Africa as a result of border tax incentives and other measures.
  - Effective responses to the potential impacts of mitigation measures must be developed on a sector by sector basis
- **Align national and regional responses**
  - The regional implications of South Africa's climate response need to be understood and coordinated with other African countries, and in particular with the Southern African Development Community

Policy and Actions - Mitigation & Adaptation Sectors



saneri
South African National Energy Research Institute
Pty (Ltd)

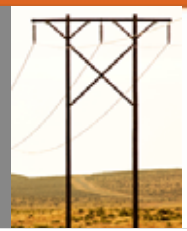
Mitigation

- Energy
- Industries and transport

Adaptation

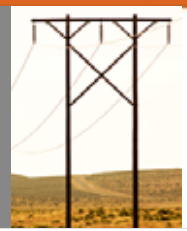
- Water
- Agriculture
- Human Health
- Natural Resources
- Human Society, Natural, Livelihoods and Services
- Disaster Risk Management

Mitigation - Energy



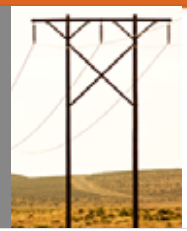
- Integrate climate constraints into IEP and IRP
- Carbon tax and other fiscal instruments
- Promote and scale up Renewable Energy and Energy Efficiency, prioritising job creation and resolving regulatory barriers
- Expand “Working for Energy” programme
- Invest in nuclear energy
- Invest in clean coal technologies
- Minimum energy performance standards (MEPS) ratings for appliances
- GHG emissions information management system
- Regulatory framework for carbon capture and storage

Mitigation – Industry and Transport



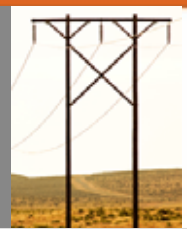
- Climate Change Response Action Plans
- Promote RE EE
- Climate Change incorporated into Industrial policy and development strategies
- Use Air Quality Act to manage GHG emissions
- Action plan to reduce methane emissions (mining) by 42% by 2025 (2000 baseline)
- Action Plan for appropriate coal bed gasification
- Promote green and domestic tourism,
- Utilise opportunities offered by the CDM, including work to resolve barriers to CDM projects
- Promote low carbon public transport and integrated land-use planning
- Invest in clean technologies in the transport sector e.g. electric and hybrid vehicles
- Support the production of cleaner and alternative fuels, including economic incentives

Adaptation - Water



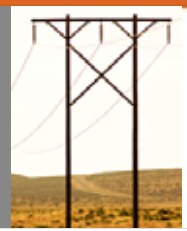
- Improve catchment management – develop capacity of agencies, address equity
- Monitor resource trends
- Greater efficiency - cost-reflective pricing, reuse wastewater, rainwater harvesting, manage and maintain infrastructure
- Desalination

Adaptation - Agriculture



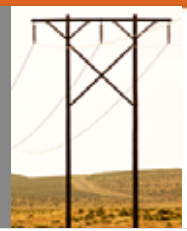
- Proactively introduce and research new methods (crop switching, diversification, drought resistance etc)
- Develop short, medium and long term scenarios
- Early warning of weather, pests and diseases – decision support tools

Adaptation - Human Health



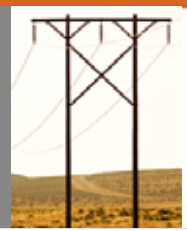
- Improve air quality to reduce respiratory disease
- Public awareness campaigns
- Develop “Heat Health” Action plans and strengthen knowledge of climate-disease linkages

Adaptation - Natural Resources



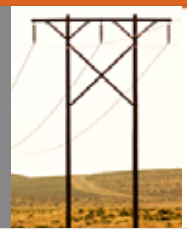
- Support research and modelling at national and sub-national scale
- Expand protected areas, improve management of unprotected areas
- Expand programmes to combat alien invasive
- Conserve and restore natural eco-system that promote resilience e.g. mangroves
- Leverage opportunities for carbon sequestration and trading
- Promote agro-forestry and indigenous tree-breeding
- Risk averse fishing quotas

Adaptation - Human Society, Livelihoods and Services



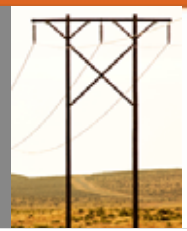
- Research urban resilience
- Downscale climate models to inform urban planning, create decision support tools
- RE EE planning and regulation of built environment – green construction
- Support rural small-scale farmers to adapt and expand rural job creation programmes through resource conservation
- Prioritise research for climate change adaptation in rural areas
- Disaster Risk Management
- Planning for coastal areas to include sea level rises and storm surges

Adaptation - Disaster Risk Management



- Develop and improve early warning systems and climate forecasts
- Maintains and update South African Risk and Vulnerability Atlas (SARVA)
- Raise awareness

Policy and Actions: Disaster Management, Natural Resources, Livelihoods and Services

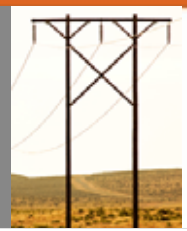


Natural Resources – Response

- Sustainable Natural Resources Management
- Optimizing carbon sequestration in agro-ecosystems
- Water Use Efficiency and Sustainability (rainwater harvesting and irrigation efficiency)
- Expand Weather network/databank
- Risk Management through response farming
- Create a gene bank of threatened species
- Sustainable conservation agricultural practices including zero or no till, multi-cropping systems, mulching or permanent soil cover

Human Society, Livelihoods and Services - Impacts

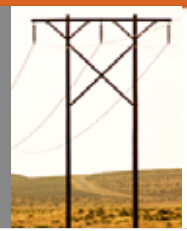
- Urban areas are water and energy intensive, Cities are slow to adapt
- Flooding, coastal erosion and sea-level rise threatens coastal communities
- Agricultural livelihoods at particular risk, the poor are worst affected



Human Society, Livelihoods and Services - Response

- Reconsider location e.g. Coastal infrastructure
- Integrate plans between sectors e.g. Water, Energy, Agric etc
- Integrate plans across stakeholders e.g. Public/private, national, provincial and local
- Downscale climate models to inform urban planning, create decision support tools

Roles and Responsibilities, Institutional Framework



saneri
South African National Energy Research Institute
Pty (Ltd)

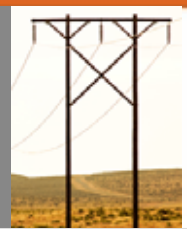
Roles and Responsibilities

- Government to review and align policy and legislation with NCCRP
- Business and Industry to develop mitigation and adaptation plans
- Civil society, labour and faith to promote public awareness and behaviour change
- Science community to improve projections, and inform strategies

Institutional Framework

- Inter-Ministerial Committee on Climate Change to have oversight of policy implementation
- Actions guided by FOSAF clusters
- IGCCC to ensure cooperative governance in implementation of policy
- MINMEC and MINTECH to ensure coherence across all 3 spheres of governance
- SALGA to coordinate local government response
- NCCC to ensure stakeholder consultation with key sectors

Mobilising Resources, Monitoring and Evaluation



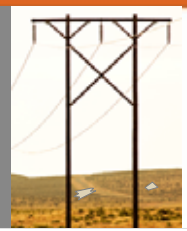
saneri
South African National Energy Research Institute
Pty (Ltd)

Mobilising Resources

- Climate Change Response Strategy to be costed
- National Climate Change Fund to be established
- Climate Change Financing Tracking Facility
- Development Financing Institutions to include CC in their planning
- Banking and Insurance to make informed decisions
- Carbon trading to be investigated as medium-long term response

Human Resources

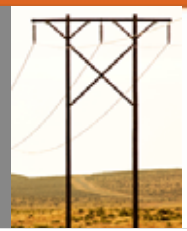
- Integrate CC into curricula, National Skills Development Strategy and SETAs
- Climate Change Awareness Programme by 2012
- Review of climate change threatened jobs by 2013
- Promote tertiary research



saneri
South African National Energy Research Institute
Pty (Ltd)

The transition to a low-carbon economy is globally recognised as a competitive and development priority, but with the understanding that this will require far-reaching changes in technology, finance, policy and societal behaviour.

SANEDI's role and goals have been defined in direct support of the energy policy and climate mitigation landscape

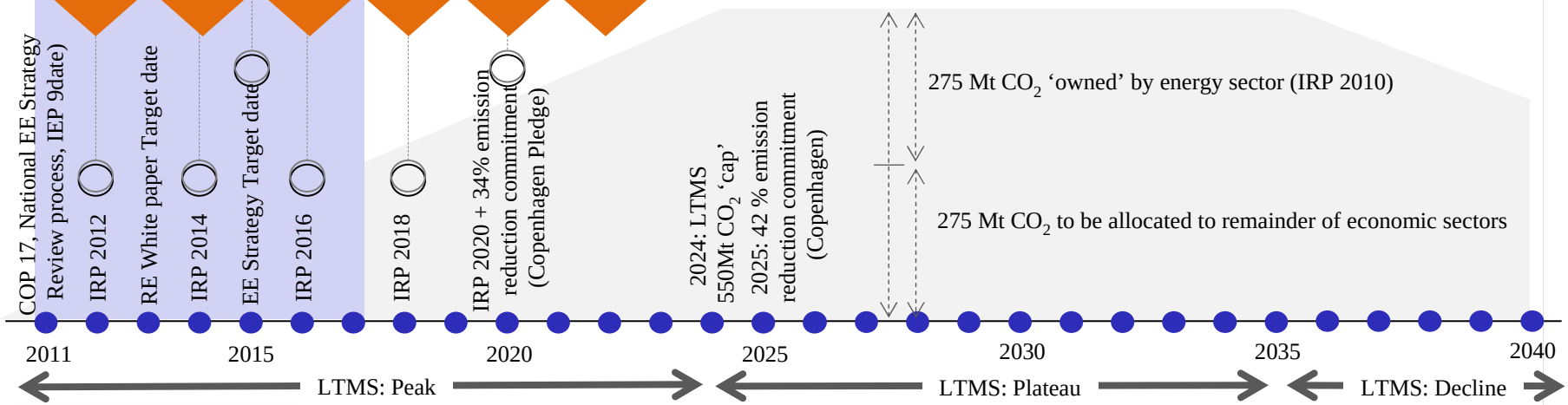


saneri
South African National Energy Research Institute
Pty (Ltd)

3.) Foster a culture of greater efficiency and more rational use of energy

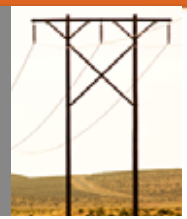
2.) Accelerated transformation to a less energy and carbon intensive economy

1.) Enable well Informed and high confidence energy planning, decision-making and policy development.



Time (years) and prominent milestones in the energy policy and climate mitigation landscape

SANEDI incorporates two key building blocks of sustainable energy solutions and a low carbon economy



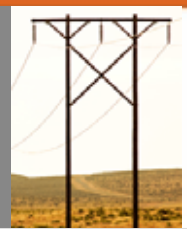
saneri
South African National Energy Research Institute
Pty (Ltd)

energy innovation

energy conservation

Energy Innovation For Life

SANEDI Vision

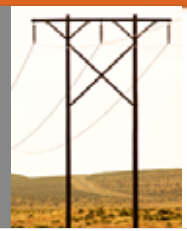


saneri
South African National Energy Research Institute
Pty (Ltd)

To serve as a catalyst for sustainable energy innovation, transformation and technology diffusion in support of South Africa's sustainable development that benefits our nation.

Energy Innovation For Life

SANEDI Mission

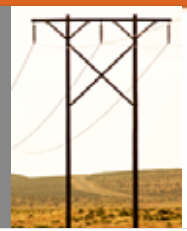


saneri
South African National Energy Research Institute
Pty (Ltd)

Advance innovation of clean energy solutions and rational energy use that effectively supports South Africa's national energy mandate and transition towards a sustainable, low carbon energy future.

Energy Innovation For Life

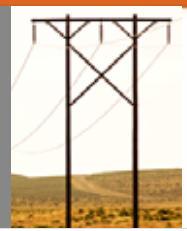
SANEDI Mandate



saneri
South African National Energy Research Institute
Pty (Ltd)

The National Energy Act, 2008 (Act No. 34 of 2008), Section 7 (2) provides for SANEDI to direct, monitor and conduct energy research and development as well as undertake measures to promote energy efficiency throughout the economy.

3 strategic orientated goals have been identified for realising SANEDI's vision



saneri
South African National Energy Research Institute
Pty (Ltd)

Strategic outcome orientated goal 1

Enable well Informed and high confidence energy planning, decision-making and policy development

Develop a **technical knowledge base** of cost effective, proven (low risk) alternative, clean energy solutions and technologies to (1) adequately inform energy planning, policy development and decision-making and (2) enable the country's transition to a competitive, low carbon economy **within the relevant planning horizon***.

Strategic outcome orientated goal 2

Accelerated transformation to a less energy and carbon intensive economy

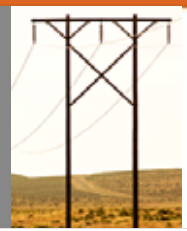
Actively stimulate 'green' energy industry development, capacity building, skills development and job creation to support the immediate concern of job scarcity and also support economic development and the critical **transformation of the South African economic structure/activities to less energy and carbon intensive** activities during the **transition period** identified by national commitments*.

Strategic outcome orientated goal 3

Foster a culture of greater efficiency and more rational use of energy

Actively influence consumer consciousness and behaviour to improve the **energy-efficiency** of existing economic activity and energy consumption by **10%** during the short-term (period of supply constraints) and to contribute to achieving a **energy resource efficient society** (described by energy intensity levels on par with international benchmarks) in the medium to long term (2020).

Incorporating 6 priority programmes that were defined in support of these goals



saneri
South African National Energy Research Institute Pty (Ltd)

Strategic outcome orientated goal 1

Enable well Informed and high confidence energy planning, decision-making and policy development

Programme 1:
Applied energy research

Programme 2:
Data and knowledge management

Strategic outcome orientated goal 2

Accelerated transformation to a less energy and carbon intensive economy

Programme 3:
Low energy and carbon intensity innovation cultivation

Programme 4:
Green industry capacity building and development

Programme 5:
Working for energy programme

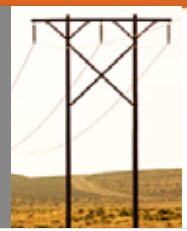
Strategic outcome orientated goal 3

Foster a culture of greater efficiency and more rational use of energy

Programme 6:
Energy efficiency programme

Energy Innovation For Life

Programme 1: Applied Energy Research



saneri
South African National Energy Research Institute Pty (Ltd)

Programme 1:
Applied energy research

Programme 2:
Data and knowledge management

Programme 3:
Low energy and carbon intensity innovation cultivation

Programme 4:
Green industry capacity building and development

Programme 5:
Working for energy programme

Programme 6:
Energy efficiency programme

Strategic Objective 1.1: Knowledge creation in the energy sector in support of policy direction

Develop a portfolio of demonstrable, cost-effective, sustainable energy options with an emissions intensity of less than 40 gCO_2/MJ that have the potential to increase the low carbon content of the South African energy mix by 5% (225 million GJ/a) by 2020) .

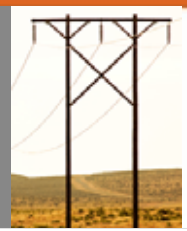
Strategic Objective 1.2: Intelligent energy systems infrastructure

Finalise an accepted, comprehensive National Smart Grid 2030 vision with tangible system benefits, and define SANEDI's role and mandate towards realising this vision by 2012. Suggested contributions may be structured as: a 20% reduction in South Africa's electricity peak demand, 100% system availability for critical loads, 40% improvement in system efficiency and asset utilization (to achieve a load factor of 70%) and incorporate 9% electricity capacity from distributed and renewable energy sources.

Strategic Objective 1.3: Optimised energy research investments

Consolidate energy related public spend for research and innovation and pursue increased overall energy research investments (nationally and internationally) to correspond with the goal of 1,5% of GDP (R5.6bn/annum for the energy sector) by 2014 of which 30% (R1 864 800 000/annum) (i.e. 0.5% of GDP for the energy sector) to be invested from public funds.

Programme 2: Data and Knowledge Management



saneri
South African National Energy Research Institute Pty (Ltd)

- Programme 1: Applied energy research
- **Programme 2: Data and knowledge management**
- Programme 3: Low energy and carbon intensity innovation cultivation
- Programme 4: Green industry capacity building and development
- Programme 5: Working for energy programme
- Programme 6: Energy efficiency programme

Energy Innovation For Life

Strategic Objective 2.1: Establishment of a Technology Management Centre

Establish a highly competent, independent technology management centre by 2017 that can adequately support energy related analysis and decision-making and tracking of progress indicators towards a low carbon economy (refer equation A, Section 8 of this plan)

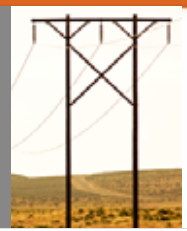
Strategic Objective 2.2: Develop and maintain a comprehensive, central data repository with high quality data relating to the areas of SANEDIs focus

Compilation and maintenance of a credible and current energy dataset to the adopted IEA standard at an adequate level of disaggregation for the areas and indicators directly under SANEDIs influence (Energy Efficiency, Renewable Energy, Clean Carbon Technology and Clean Oil and Gas, Carbon Capture and Storage, Smart grids, Working for Energy, Tax incentives) by 2013 and thereafter maintain as current and continue to develop in response to national requirements.

Strategic Objective 2.3: Enhanced access to energy information and knowledge

Provide appropriate (in a suitably controlled manner to protect confidentiality commitments) access and disseminate available energy data to a broad range of users as soon as possible and sustained over the planning horizon.

Programme 3: Low energy and carbon intensity innovation cultivation



saneri
South African National Energy Research Institute Pty (Ltd)

Programme 1:
Applied energy research

Programme 2:
Data and knowledge management

Programme 3:
Low energy and carbon intensity innovation cultivation

Programme 4:
Green industry capacity building and development

Programme 5:
Working for energy programme

Programme 6:
Energy efficiency programme

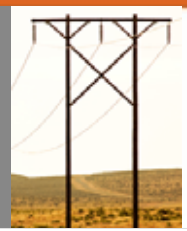
Strategic Objective 3.1: Increase the share of demonstration and commercialisation phase projects in SANEDI's portfolio

Increase the focus on innovation and demonstration by increasing the share of projects in the portfolio that are in the Demonstration and Commercialisation phase to 40% (currently 32% of the portfolio by number of projects and spend) by 2017.

Strategic Objective 3.2: Facilitate technology innovation progress to commercialisation

Transfer one fully-fledged, commercially viable concept for every R500 million spent on Research and Development to TIA or EDC or similar for active business incubation and deployment.

Programme 4: Green industry capacity building and development



saneri
South African National Energy Research Institute Pty (Ltd)

Programme 1:
Applied energy research

Programme 2:
Data and knowledge management

Programme 3:
Low energy and carbon intensity innovation cultivation

Programme 4:
Green industry capacity building and development

Programme 5:
Working for energy programme

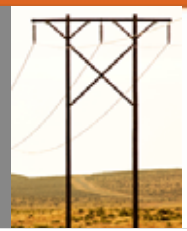
Programme 6:
Energy efficiency programme

Strategic Objective 4.1: Growing the pool of active and productive researchers, technicians and support staff Actively contribute to strengthening research leadership and capacity and contribute to job creation and skills development by creating 100 additional research positions (i.e. ~25% increase for the sector) (including research chairs, assistant research chairs, fellowships as well as internal research positions) by 2017.

Strategic Objective 4.2: Facilitate the development of a skilled workforce that meets the needs of the changing economy
Mobilise and coordinate an industry-wide skills development initiative (which should include, amongst others, establishment of a reference and support group for green jobs and skills and a key occupations review process) for energy efficiency and renewable energies that leverages and complements existing frameworks and structures and resolve identified gaps.

Strategic Objective 4.3: Promote job creation through innovation
Deliver at least 1 permanent employment position for every R1,5 million spent on technology innovation (demonstration and commercialisation innovation stages) until 2017.

Programme 5: Working for energy



saneri
South African National Energy Research Institute Pty (Ltd)

Programme 1:
Applied energy research

Programme 2:
Data and knowledge management

Programme 3:
Low energy and carbon intensity innovation cultivation

Programme 4:
Green industry capacity building and development

Programme 5:
Working for energy programme

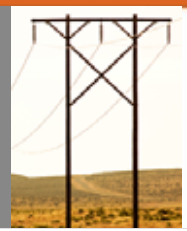
Programme 6:
Energy efficiency programme

Strategic Objective 5.1: Demonstrated increase in employment levels within participating communities. Create 400 new full time employment opportunities and 120 000 person days of temporary employment during the five years until 2017 and hence contribute 0.01% (equivalent to 500 new jobs) towards the 5 million new jobs by 2020 targeted by the new growth path.

Strategic Objective 5.2: Rural clean energy production and provision
Establish clean energy and electricity production/generation and supply facilities equivalent to 5MWp and 25 GWh/a within (rural) communities by 2017 with all associated economic, social and sustainability benefits.

Strategic Objective 5.3: Demonstrated Energy Management opportunities
Develop and demonstrate the rural application of energy efficiency technologies to deliver energy savings of 0.5 MW and 1.5 GWh/a by 2017 with all associated economic and environmental benefits.

Programme 6: Energy efficiency programme



saneri
South African National Energy Research Institute Pty (Ltd)

Programme 1:
Applied energy research

Programme 2:
Data and knowledge management

Programme 3:
Low energy and carbon intensity innovation cultivation

Programme 4:
Green industry capacity building and development

Programme 5:
Working for energy programme

Programme 6:
Energy efficiency programme

Energy Innovation For Life

Strategic Objective 6.1: Establish SANEDI as National Champion for Energy Efficiency

Define NEEA's role to play a central role and for an optimal impact on South Africa's energy culture; develop and implement a plan for NEEA to transition into fulfilling this role comprehensively by 2017.

Strategic Objective 6.2: Energy Efficiency improvements in Public Facilities

Target an annual reduction in energy consumption by 250 GWh and GHG emissions by 250 tCO_2e in public facilities by 2017.

Strategic Objective 6.3: Create large-scale awareness of energy efficiency and market demand for energy efficient and green technologies

Improve general awareness levels** across all sectors by 5% by 2015 relative to 2012 (in support of equation A, term 1, Section 8 of this plan).

**define awareness scope i.e. recognition of the need to save energy, how to save energy, etc .

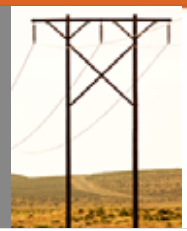
Strategic Objective 6.4: Create market demand for energy efficient and green technologies

Achieve a 10% real increase (over and above existing trends) in sales of energy efficient and green technologies by 2017.

Strategic Objective 6.5: Support the Income Tax Amendment Act

Establish the capacity to support the certification of energy savings for tax reduction claims .

What will be needed in the form of technology transfer and financial support?



- Technology transfer
  - Material research
  - Smarter grids – modelling systems, planning tools, variable source integration
  - Energy Modelling tools – integrated resource planning (top down and bottom up), energy value chain focused
  - Electric vehicle
  - Creation of test and demo centre's – shorten learning curve, learning by doing, learning by using, learning by interacting
- Funding
  - SA is not immune to the financial crisis and we have a unemployment time boom
  - Rather than solve our energy problems empower us to effectively solve our own problems, this helps us create jobs and beneficiate our raw materials
  - Skills development with experiential learning
  - Access to international finance mechanisms

saneri
South African National Energy Research Institute
Pty (Ltd)

Thank You