



the dti

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Department:  
Trade and Industry  
REPUBLIC OF SOUTH AFRICA

# Green Industries

Sub. Dir\_Energy Efficiency

# What is energy efficiency?

Ratio of  
output to  
input

- The higher the coefficient the more efficient is the system

Optimal use  
of energy by  
consumers  
through

- Technology
- Shift in energy usage
- Behavioral changes
- Economic conditions

# Purpose and objectives of EE

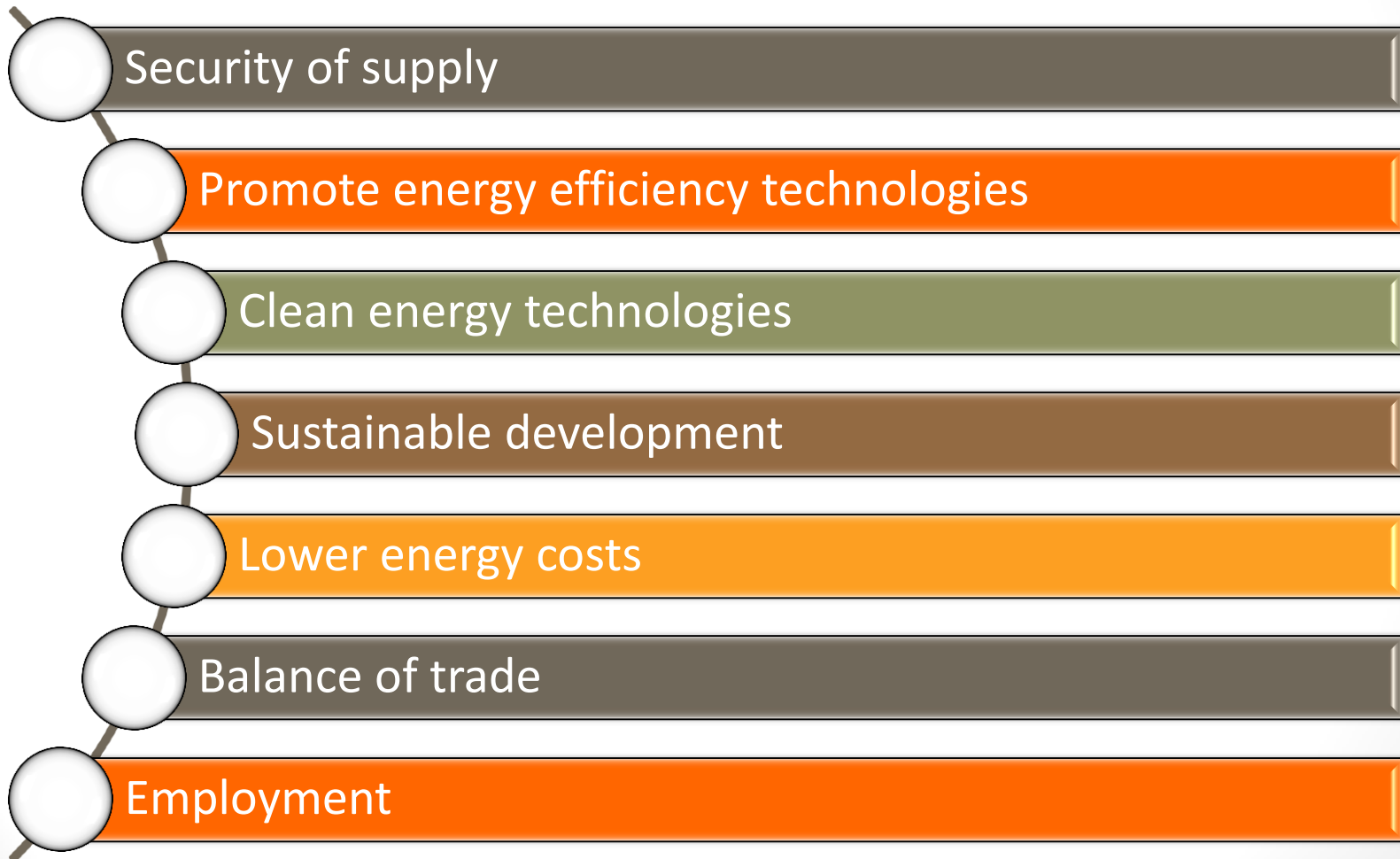
South Africa is a comparatively energy and carbon intensive country compared to other African countries, as well as many developed nations. It is ranked 16th in the world in terms of the total amount of primary energy consumption. South Africa depends mainly on fossil fuels for its total energy needs.

Sector	TJ	%
Industry	886 831	35.9
Commerce	118 429	4.8
Residential	603 557	24.4
Mining	164 098	6.6
Transport	583 569	23.6
Agriculture	84 456	3.4
Non-energy use	29 828	1.2
Total	2 470 770	100

# Economic Rationale For Energy Efficiency

- Energy price increases progressively create opportunities for EE technologies
- Potential to promote industrial growth, diversification and competitiveness
- Leads to creation of new business enterprises to overhaul processes and broker recovered materials
- Economic modeling estimate: employee personal spending supports 1 500 000 jobs with a turnover of \$146 billion
- US Study: For every \$1 produced in recycling industry, production increases by \$2.35
- SA: For each R1 produced, total of R2.23 produced within the entire economy

# Rewards of EE



# Economic Challenges

## Consumption-driven growth path

- SA's growth path has hitherto been characterised by consumption-driven sectors growing at twice the rate of its productive sectors. Services surplus manufacturing

## Financialisation & import intensity

- The economy has experienced extensive financialisation, but the financial sector has not supported productive sector investment; growth has been import-intensive rather than based on growth in the domestic manufacturing sector.

## Structural unemployment

- High structural unemployment has remained a constant, oscillating between 22,5% and 25% on the narrow definition.

# Role of Green Industries

## Promote Greening and Green Industry Development:

Promote Industrial competitiveness in existing firms	Promote new product development	Promote industry development in new product/service sectors	Gear current and future industrial financing instruments (MCEP, MIP, IDC Green Fund and Bank financing) to support green economy financing	Identify sectors that need funding	Funding of new skills sectors	Promote localisation and growth of the domestic energy efficiency industry
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# Industrial Development Levers

## Public Procurement

- Sector Designation and Competitive Supply Development Programme
- Renewable Energy Independent Power Producer Programme (REIPPP)
- Procurement Accord
- National Industrial Participation Programme (NIPP)

## Innovation and Technology

- Supporting New Technologies, Incubators and Commercialisation of innovations

## Industrial Financing

- Ongoing re-orientation of IDC, Critical Infrastructure Programme (CIP) and Manufacturing Competitiveness Enhancement Programme (MCEP)

## Developmental Policies

- Flexible/Strategic tariff setting, enabling standards and compulsory specification, illegal imports and dumping using SARS, SABS, SANAS and NRCS

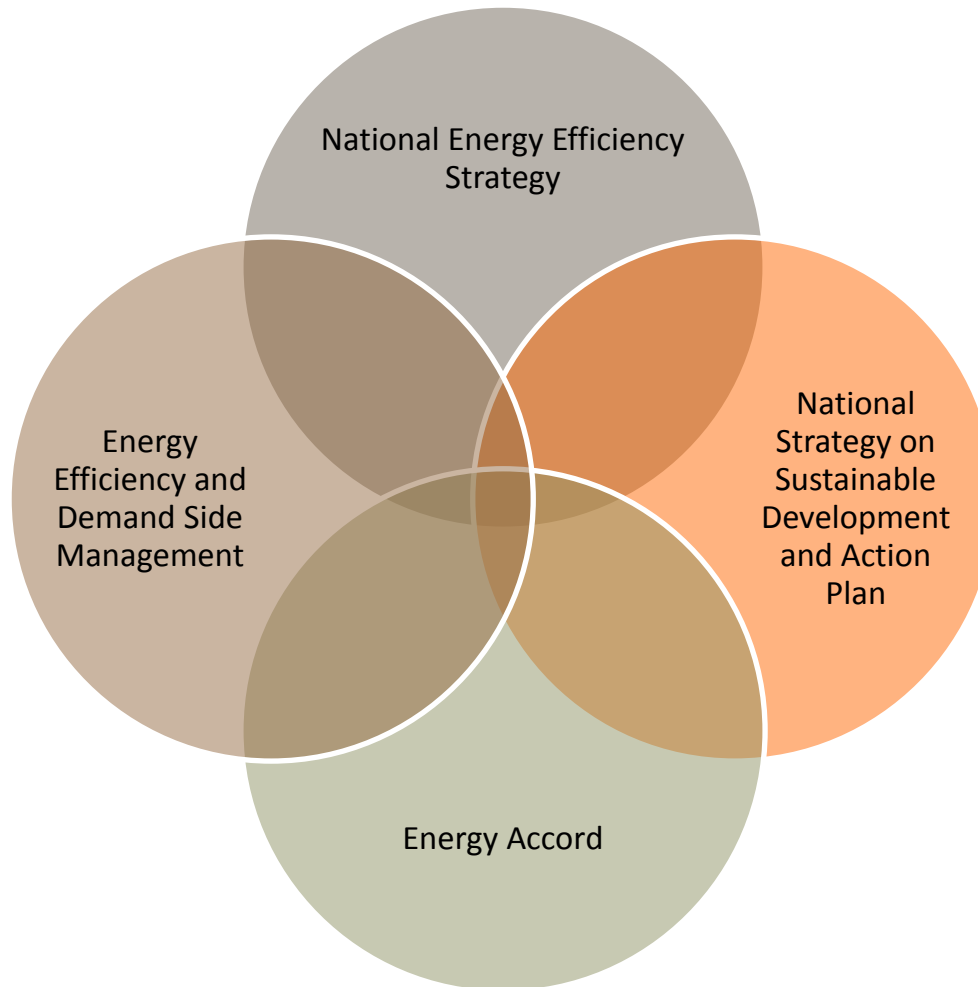


## Energy Efficiency policies

- National Energy Efficiency Strategy (2005, 2008, 2012)
- White Paper on the Energy Policy (1998)
- Integrated Resource Plan (IRP) 2010
- Renewable Energy White Paper (2003)
- Policy to support EEDSM Program for the Electricity Sector through the Standard Offer Incentive Scheme (2010)
- Industrial Policy Action Plan (IPAP)
- National Climate Change Response White Paper (2011)
- National Strategy for Sustainable Development and Action Plan (NSSD)
- Green Building Policy Final Draft
- New Growth Path (NGP 2011)
- National Development Plan 2030 (NDP 2012)

## Energy Efficiency and Related Policies

# Policy framework



# Energy Efficiency Strategic Framework

Reduction in  
Energy Demand

Improved local  
manufacturing  
and utilisation

Standardisation  
of technology

Improvement in  
life cycle  
management

- Support Energy Efficiency market development
- Invest in high impact sector interventions to reduce demands
- Re-orientate Energy Efficiency funding mechanisms
- Promote local manufacturing of Energy Efficient products
- Designate products and services aimed at improving Energy Efficiency that address load reduction and demand side management
- Influence the standards that support energy efficiency
- Investments in the EGS sector, including building of local solar water heater industry
- Conduct research into Energy Efficiency potential for local development environment

# Energy Accord

Aim: Align Energy policies with improvement in energy efficiency policies implementation in order to meet a target of energy demand reduction of 12 % by 2015 and beyond

- Attract investments in Energy Efficiency Technology development projects
- Promote industry competitiveness through resource efficiency and cleaner production measures.
- Support Energy Efficiency measures deployment to companies by supporting companies to understand and scope their energy requirements through NCPC-SA assessments and interventions
- Improve in-company efficient energy use
- Promote the use of demand side management to drive energy efficient products development and deployment
- Influence development and recognition of skills relevant to sustainability
- Exploit existing government coordination bodies to promote intergovernmental coordination of approaches and opportunities presented by Energy Efficiency projects across different government mandates.
- Promote investment - attracting investments in energy efficiency development
- Review Energy Efficiency policies and strategy

# National Energy Efficient Strategy of South Africa

Aim: Energy Efficient strategies to achieve sustainable energy sector development and use with the environment impact in mind by:

- Encouraging energy efficiency practices with the aim of:-
- reducing pollution, energy cost and necessity for additional power generating plants
- improving industrial competitiveness and job creation
- enhancing energy security

# Opportunities

- In South Africa, there is significant potential for Energy Savings in several sectors
- Energy Efficiency is obtainable through the following interventions:
  - Energy Efficiency Appliance Labelling
  - Energy Audits (IEE)
  - Energy Management Systems
  - SWH Designation
  - New Technologies

# Industrial opportunities

- EE appliances and machinery
- RECP projects – domestic recycling, industrial waste management, carbon footprint and life cycle assessment
- School of learning; capacity building
- Certification and accreditation
- Increasing the use of recycled energy, i.e. cogeneration
- Renewable energy generation
- New product development, e.g. hybrid cars, use of public transport

- Energy conservation
  - The use of motion sensors – connected to heating, cooling and lighting systems
  - The use of passive infrareds (PIRs) to switch off lighting when areas are unoccupied
  - Smart meters, etc.
- Energy substitution
  - Renewable Energy sources
  - Fuels switch
- Re-generation/own-generation measure
  - Use of excess materials to generate energy, e.g. steam, heat and other operational by-products

## Energy Efficiency Products



# The dti projects

- Transport Refrigeration project
- EE study
- IEE Project Phase II

# Transport Refrigeration project

- According to the Department of Environmental Affairs, overall emissions from the transport sector in South Africa have been rising since 2000. By 2025, emissions are forecast to be 100% higher than in 2000 under the “Without Measures” reference scenario. By 2050, the increase in emissions is projected to be almost 300%.
- The road transport sector accounted for around 94% of transport GHG emissions in South Africa in 2000.
- The Transport Refrigeration project is aimed at promoting temperature controlled supply chain or cold chain, where perishable consumables (fresh food, medicines, flowers, cosmetics and certain industrial products) are kept at a consistent temperature - critical to avoid shortening of shelf lives and reduction in quality of produce, and to avert complete spoilage during transport.
- Globally, between 10 and 50% of all produced food goes to waste between harvesting and consumption. Over 50% of fruits and vegetables are lost in African countries.

# Transport Refrigeration project

- Transport Refrigeration is aimed at achieving the following:
  - Save energy through vehicle thermal body design that will maintain K-value: heat transfer coefficient for thermal conductivity of insulation materials
  - Improve on the thermal efficiency of refrigerated units, thus reduce GHG emissions.
- Project activities include:
  - Test chamber establishment
  - Training of SA technicians to operate and maintain the chamber
  - ITC on datafrig to monitor and evaluate products in transit for different logistics modes
- Cross-cutting areas by the Project:
  - Food Security
  - Food safety
  - Energy Efficiency
  - Automotive body design and refrigerated units manufacturing industry development
  - Climate change resilient measures

# Key Stakeholders

- International: GIZ and Cemafroid
- National government departments: DoE, DoT, DoH, dti, DEA
- Non-government: SABS, NRCS, RMI, SARDA
- Logistical companies: Imperial, etc.
  
- Transport Refrigeration is aimed at benefitting the following:
  - Brand owners: National Markets, Woolworths, checkers, PicknPay, Spar, etc.
  - Consumers and farmers

# Key Project Milestones

- Training and R30 million equipment procurement secured with Internationals: GIZ and Cemafruid
- Existing standards review: New standard development
- Standards working committee established.
- SABS being trained to operate and maintain the equipment facility
- PSC with all stakeholders representatives established
- Real estate issues settled with SABS
- Outstanding issues:
  - Testing cost analysis with industries and SABS need to be discussed
  - The project commission beyond the PSC for sustainable equipment use needs to be discussed
  - Brand owners and logistics companies need to be engaged to map their participation in the project

## Industrial Energy Efficiency (IEE) Project, Phase II

- Build up from IEE Phase1 achievements.
- Strengthening policy frameworks and implementation support for IEE standards
- Data quality improvement to strengthen industrial energy efficiency and energy management planning policy
- Mainstreaming EnMS and ESO training programmes
- Investment promotion in Industrial Energy Efficiency through demonstration of EnMS and ESO and support to access financial mechanisms and incentives in industry and selected commercial sectors
- EnMS and ESO awareness, promotion, service demand generation and lessons sharing
- Project Monitoring and Evaluation

## IEE Phase II outcomes

- ENMS and ESO: Formulation of concept for demonstration projects for each industrial cluster and their contained value chains
- Energy Audits undertaken in 150 individual enterprises including 50 large enterprises and 100 SMEs.
- Demonstration project implementation
- Documentation of demonstration projects
- Demonstration replication action plan
- Establishment of IEE finance clearing-house and match-making support mechanism within NBI
- Guidelines for development of bankable industrial energy efficiency projects
- Seminars for experts and industry personnel including on the following topics: Evaluation of IEE opportunities; Government financial incentive criteria and the financing criteria of banks; Development of bankable projects under EnMS and ESO

# IEE Phase II stakeholders

- International: SECO and UNIDO
- National government departments: DoE, dti, DEA, EDD
- Non-government: NCPC, SABS, CSIR
- Industry players from energy-intensive sectors



## EE Study Scope (Technologies)

- In South Africa, different definitions of EE are notable and include the following among:
  - EE is the ratio of other quantitative relationships between an output of performance, service, goods or energy, and an input of energy (NEES 2012)
  - EE is a measure of the savings of energy, which is used to provide goods and services, while maintaining the desired benefits (White Paper on Energy Policy 1998)
  - EE is efficient utilisation of an energy carrier or resource (SANS 50010:2011: Measurement and Verification of Energy Savings)
  - EE involves interventions that reduce the energy consumption levels of a particular energy service without reducing its quality (Gauteng Provincial Government, 2009)

## EE study Scope

## Conclusion

- Strengthened cooperative governance
- Industry to come forward and participate
- Industry to come forward and support different initiatives
- Promote DFI and local funders to drive local initiatives