



# Department of Energy

## RENEWABLE ENERGY SOUTH AFRICA

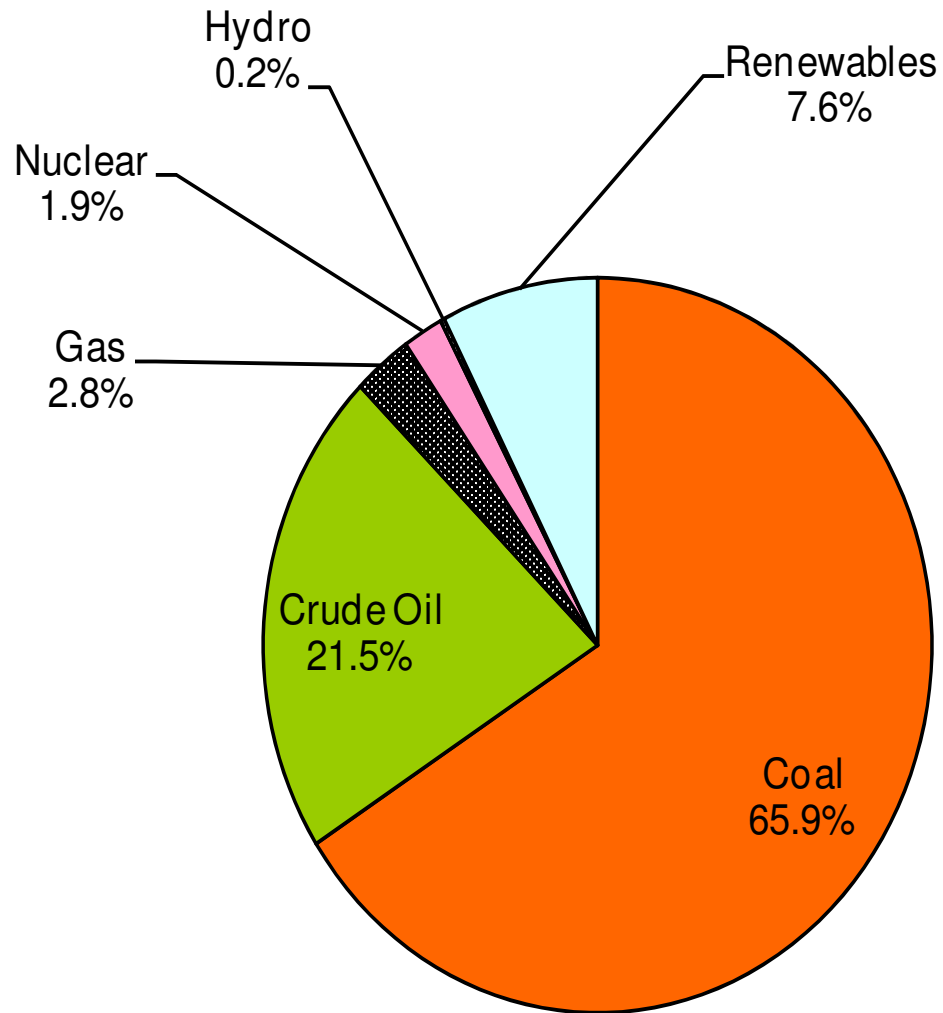


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## Primary Energy Supply - 2006





# White Paper on Renewable Energy

- The White Paper on Renewable Energy (2003) has set a target of 10 000GWh of energy to be produced from renewable energy sources by 2012. This is mainly from Biomass, Wind, Solar and Small-scale hydro

To put the 10 000GWh 2013 target into perspective, this would be equivalent to electrifying approximately two million households having an annual electricity consumption of 5 000 kWh. Put another way, the 10 000 GWh target is equivalent to about 5 percent of the present electricity generation in South Africa. This is equivalent to replacing two (2 x 660MW) units of Eskom's combined coal-fired power stations.



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# Renewable Energy Strategy

- The White Paper's target of 10 000GWh renewable energy contribution to final energy consumption by 2013 was confirmed to be economically viable with subsidies and carbon financing.
- Achieving the target will:
- Add about 1.667MW new renewable energy capacity,
- Create additional government revenue;
- Stimulate additional income that will flow to low-income households,
- creating just over 20 000 new jobs; and
- Contribute to water savings



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# Biofuels Industry Strategy

- The draft Strategy suggested that given South Africa's climatic condition, agricultural potential, land availability and food security, the country can afford a 4.5% biofuels penetration to the current fuel pool by 2013.
- Biofuels were also identified to be amongst the key drivers of the government program the Accelerated Growth and Industrial Strategy for South Africa (Asgisa) and as a result the development of this industry was recognised as having multiple objectives one of which is economic development in the second economy. Read the complete.



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# Solar Power

- The use of solar energy is the most readily accessible resource in South Africa. It lends itself to a number of potential uses and the country's solar-equipment industry is developing. Annual photovoltaic (PV) panel-assembly capacity totals 5MW, and a number of companies in South Africa manufacture solar water-heaters.
- A pilot programme has been launched to establish a limited number of public-private sector institutions in conjunction with the relevant municipalities to provide electricity services on an integrated basis.
- DoE has already set targets for solar water-heating projects and has initiated a number of pilot projects.



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# Hydropower

- The Baseline Study on Hydropower in South Africa, indicated that specific areas in the country show significant potential for the development of all categories of hydropower in the short and medium term.
- The Eastern Cape and KwaZulu-Natal are endowed with the best potential for the development of small, i.e. less than 10MW hydropower plants.
- The Southern African Power Pool ([SAPP](#)) allows the free trading of electricity between Southern African Development Community (SADC) member countries, providing South Africa with access to the vast hydropower potential in the countries to the north, notably the significant potential in the Congo River (Inga Falls).



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# Wind

- Wind as an energy source is only practical in areas that have strong and steady winds. South Africa has fair wind potential, especially along the coastal areas of Western and Eastern Cape. Currently, the Klipheuwel wind farm is operating near Cape Town as well as the Darling wind farm
- Overall, the total production annually has been just more than 4GWh.
- The Klipheuwel wind farm has a total capacity of 3.2 MW
- The Darling wind farm produces approximately 1.3MW of electricity each, This is the 1st grid connected, independent wind energy power-generating facility developed in South Africa.



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# Hybrid Energy

- Hybrid energy systems are a combination of two or more renewable energy sources such as PV (photovoltaic), wind, micro-hydro, storage batteries and fuel powered Gen-sets to provide a reliable off-grid (a source of energy not connected to a grid) supply.
- Currently, there are two pilot hybrid systems in the Eastern Cape:
- The **Hluleka** hybrid mini-grid system consists of two proven 2.5 kW wind generators and three Shell Solar PV module arrays fitted with 56 100-watt PV modules wired in series (total 10.6kW).
- The **Lucingweni** hybrid system consists of 50kW solar PV panels and 36kW wind generators serving 220 dwellings (four lights per dwelling, radio, television, cell phone charger, street lighting, telecommunications and water pumping).



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# Co-operation

•Renewable energy sources, other than biomass (the energy from plants and plant-derived materials), have not yet been exploited optimally in South Africa. The DoE has strengthened international relationships in this area via partnerships established during the World Summit on Sustainable Development (WSSD) in 2002.

Such partnerships will overcome market barriers and promote widespread use of sustainable energy solutions. These include the Global Village Energy Partnership and the Renewable Energy and Energy Efficiency Partnership.



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# Renewable Energy Technologies

In terms of a study undertaken the technologies to be implemented first, based on the level of commercialisation of the technology and natural resource availability.

These technologies include:

- Sugar-cane bagasse (the fibre that comes from crushing the sugar cane) for cogeneration;
- Landfill gas extraction;
- Mini-hydroelectric schemes;
- Commercial and domestic solar water heaters;



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# Renewable Energy Financing

- The Department has introduced nominal, once-off capital subsidies to assist project developers in implementing economically sound projects that are readily financed by financial institutions.
- Every year the DoE collects data on renewable energy contributions from relevant stakeholders to assess or evaluate progress towards this goal.
- The target can be achieved mainly from production of renewable energy by grid, off-grid (a source of energy not connected to a grid) and bio-fuel facilities. This renewable energy will be used for power generation to the grid and for water heating purposes.

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# Tradable Renewable

- Tradable Renewable Energy Certificate is an electronic record that verifies the origin of energy by the registered renewable energy entity, it refers to green certificate or green tags.
- TREC is based on separating the various attributes of renewable resource based energy provision from physical energy carrier, electric or otherwise. It is another revenue stream for renewable energy Independent Power Producers (IPPs). Major advantage of TREC is that, apart from extra income stream, certificates can be traded worldwide and separately from the electricity grid infrastructure, which is no use of grid system charges or grid access problems.

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## Renewable Energy Finance and Subsidy Office

- The DoE has established the Renewable Energy Finance and Subsidy Office (REFSO), whose mandate includes:
  - The management of renewable energy subsidies; and
  - Offering advice to developers and other stakeholders on renewable energy finance and subsidies.
- Since the establishment of REFSO, six projects with a total installed capacity of 23.9 MW have been subsidised. Three of these projects are small scale hydro, biogas to electricity project, wind energy and landfill gas to electricity.



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# Tradable Renewable

- In March 2008 the SANTRECT was formed by the DoE with an aim to facilitate and coordinate the establishment of Issuing Body (IB) as Non-Profit Organisation (NPO) that will be responsible for registering, issuing, transfer and redeem certificate in South Africa.

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# Working for Energy Programme

Working for Energy is a new programme that the DoE is responsible for implementing. The basic principle behind this programme is to develop and implement labour intensive energy related initiatives that will be closely aligned with the “Working for Water” programme. It will focus on interventions aimed at demand-side management and the provision of electricity from biomass-based resources.

The Department has appointed the South African National Energy Research Institute (SANERI) as the implementing agent for the Working for Energy Programme.



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# Working for Energy Programme

The programme has two focus areas:

## **Provision of Renewable Energy**

The scope of activities under the programme shall focus on labor intensive projects related to research and demonstration (as per the SANERI mandate) in the following focus areas.

- Biomass from invasive alien plants and bush encroachment;
- Charcoal derived from invasive alien plants and grasses;
- Biofuels development and implementation in rural applications;
- Mini-Grid Hybrid and Smart Grid Systems;
- Solar power (Concentrated PV) and
- Micro hydro systems.



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# Working for Energy Programme

## Energy Management

- Framework for energy audits and energy management planning for schools, homes and businesses;
- Framework for the development and Installation of Biomass ceiling materials for installation as EE improvements for poor or rural households;
- Framework for provision of energy and water saving technologies for both retro-fitting and new works; and
- Framework for the development and implementation of Measurement and Verification protocols for DSM projects incorporated under the programme.



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# Request for Information

- Request for Information has been issued by DoE to Potential developers of renewable energy projects under the REFIT programme in South Africa
- (on-shore wind, solar, biomass, biogas, small
- hydropower and landfill gas)
- AND
- Potential developers of cogeneration projects
- *Responses are due by 17h00 on Thursday, 7 October.2010.*



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