



# Department of Energy

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# Purpose

To provide a summary of recent and topical energy policies and analysis of the energy sector from primary resources of energy to the final consumption of energy by the various economic sectors in South Africa.



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# Energy Policies

The Energy White Paper is the premier policy document which guides all subsequent policies, strategies and legislation within the energy sector. Several key energy policy documents are briefly outlined below

- ***The White Paper on Energy Policy, 1998***: consists of four parts: context and objectives for energy policy; demand sectors; supply sectors and crosscutting issues. Its objectives are to
- ***The White Paper on Renewable Energy, 2003*** :provides a national context for the White Paper on Renewable Energy by emphasising integrated resource planning. This ensures that necessary resources are provided to promote renewable energies.



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# Energy Policies

- ***Integrated Resource Plan, 2010:***The Integrated Resource Plan (IRP2010) supersedes the Energy Security Master Plan for Electricity which was approved by cabinet in 2001. The IRP2010 determines the demand profile for electricity over the next 20 years and details how this demand can be most effectively met from various resources, such as nuclear energy, coal, gas and renewable energies.
- ***National Energy Act 2008:***is a framework legislation which empowers the Minister to undertake certain measures to ensure energy security. It also serves to address gaps in existing legislation or those elements in the Energy White Paper which have not been implemented.



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# Energy Policies

- ***Integrated Energy Planning (IEP)***: involves estimating how much energy all the different consumers (e.g. industry or households) will need in the future to deliver certain services; and then identifying a mix of appropriate sources and forms of energy to meet these energy service needs in the most efficient and socially beneficial manner. focuses on the energy service needs of energy users. To meet users needs effectively, different fuels or a mix of fuels or possibly alternative investment in conservation or efficiency measures need to be considered. Energy systems analysis and subsequent policy formulation has to manage effectively the balance required by the complex set of interaction between individual supply sector and wider socio-economic, policy and environmental considerations.



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# Energy Policies

- ***National Nuclear Regulator Act, 1999***: The aim of National Nuclear Regulator Act, 1999 (Act No. 47 of 1999), is to provide for the establishment of a National Nuclear Regulator in order to regulate nuclear activities; to provide for safety standards and regulatory practices for protection of persons, property and the environment against nuclear damage.



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# Energy Resources

Energy in South Africa is dominated by fossil fuels with high dependence on cheap and abundant coal. Imported and synthetically produced crude oil provides about 16% of South Africa's primary energy needs. A limited quantity of natural gas is available. South Africa has considerable renewable energy potential. Biomass is estimated to comprise 8% of South Africa's primary energy supply used for cooking and heating in households

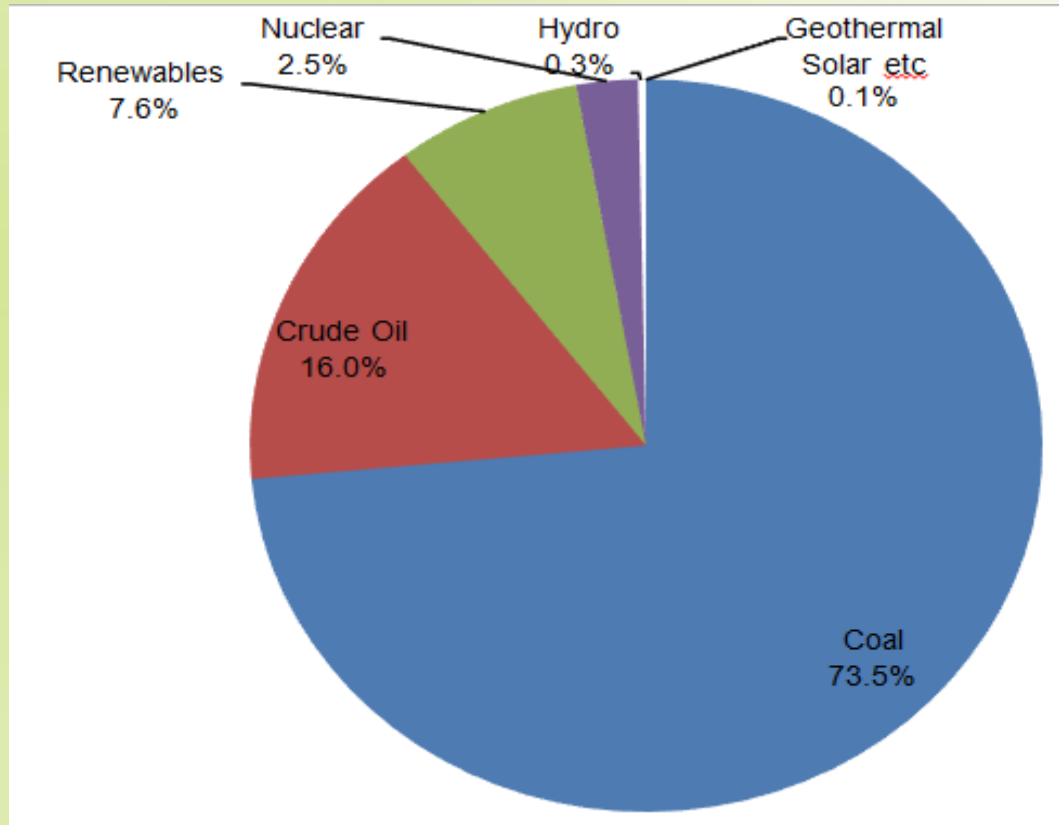


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# Primary Energy Supply



DoE, 2010



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# Energy Transformation, Transmission and Distribution

- Transformation converts primary to final and include power stations such as; coal, oil refining, synthetic fuels production, uranium enrichment and electricity generation
- There are two kinds of energy transmission in SA:
  - ✓ ELECTRICITY GENERATION: Is dominated by coal due to cheap coal and Eskoms programme of building large, standardised coal stations.
  - ✓ LIQUID FUELS: This includes petrol, diesel, paraffin, Jet fuel, liquid petrol gas (LPG). This are produced in RSA in three ways; CTL, GTL and Crude oil to liquid fuels.
- Electricity is at present distributed by Eskom, municipalities and town councils. In the past, there were large differences between the performance and revenue of the distributors of electricity.

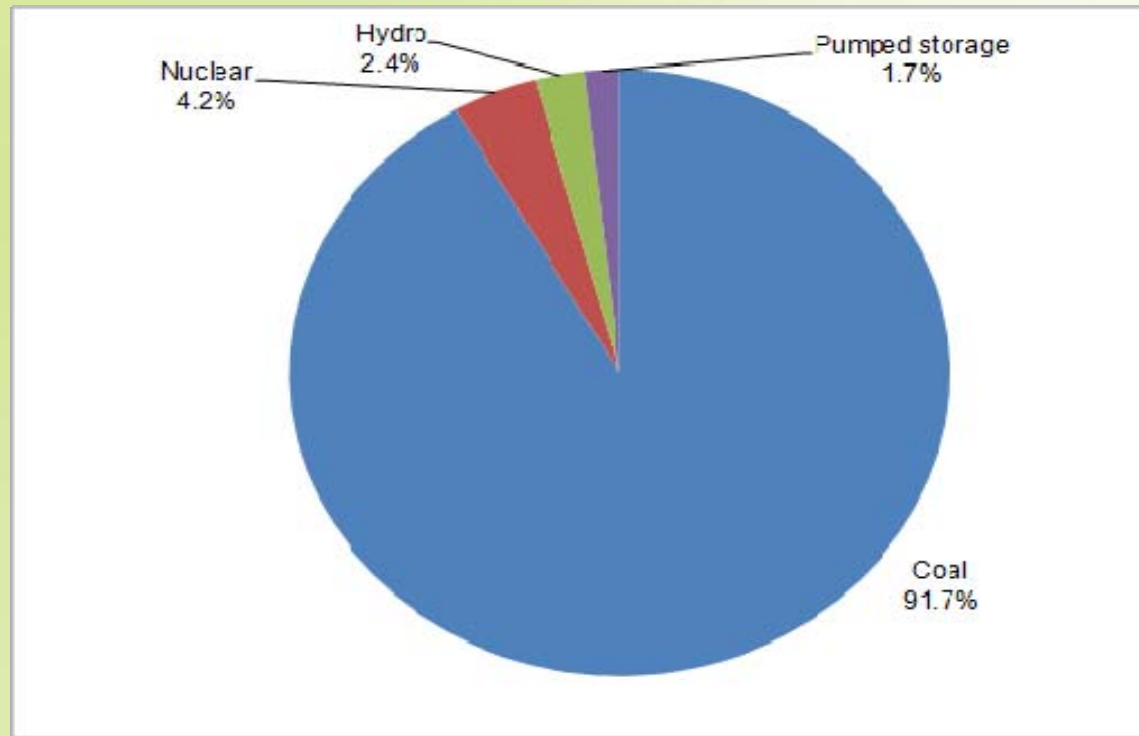


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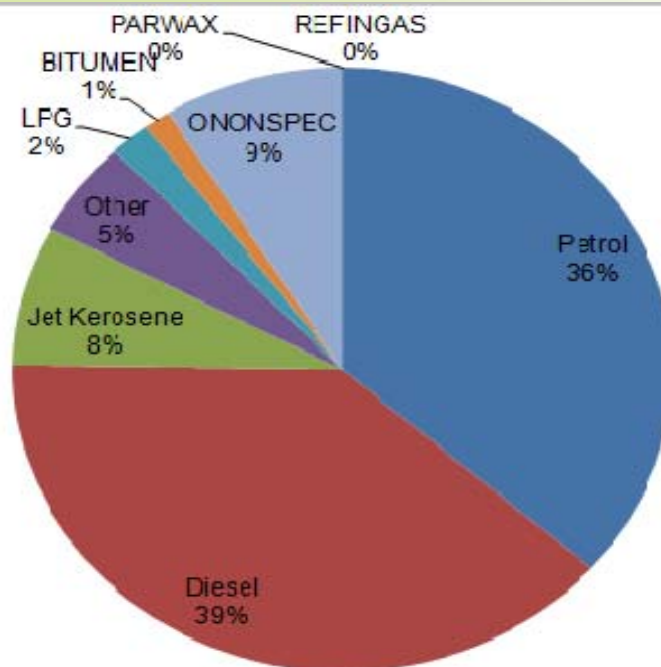
## Capacity to generate electricity by energy source 2008 (DME, 2009:45)



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## Domestic supply of petroleum products 2008

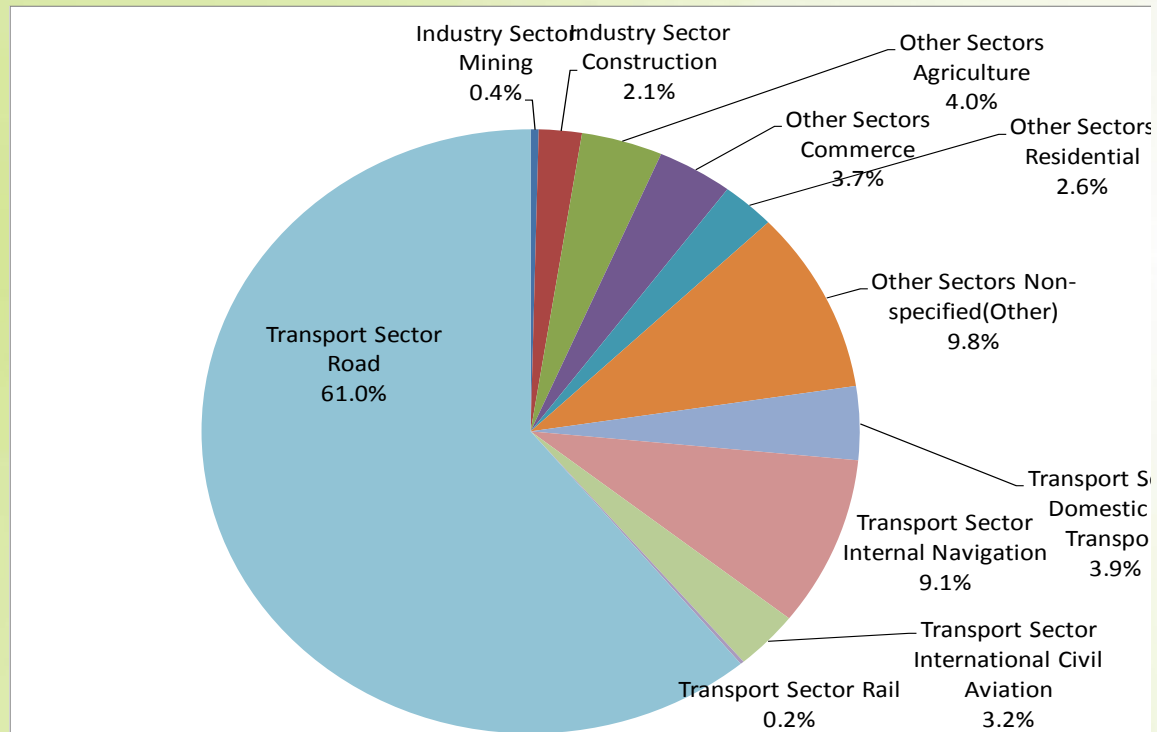


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## Consumption of petroleum products by sector 2008



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# Energy Demand by sector

The South African economy can be divided into five economic sectors: industry (including mining); commerce and public services; transport; agriculture; and residential. The commerce and public services sector includes government buildings, offices, shops, hospitals, education, entertainment and museums

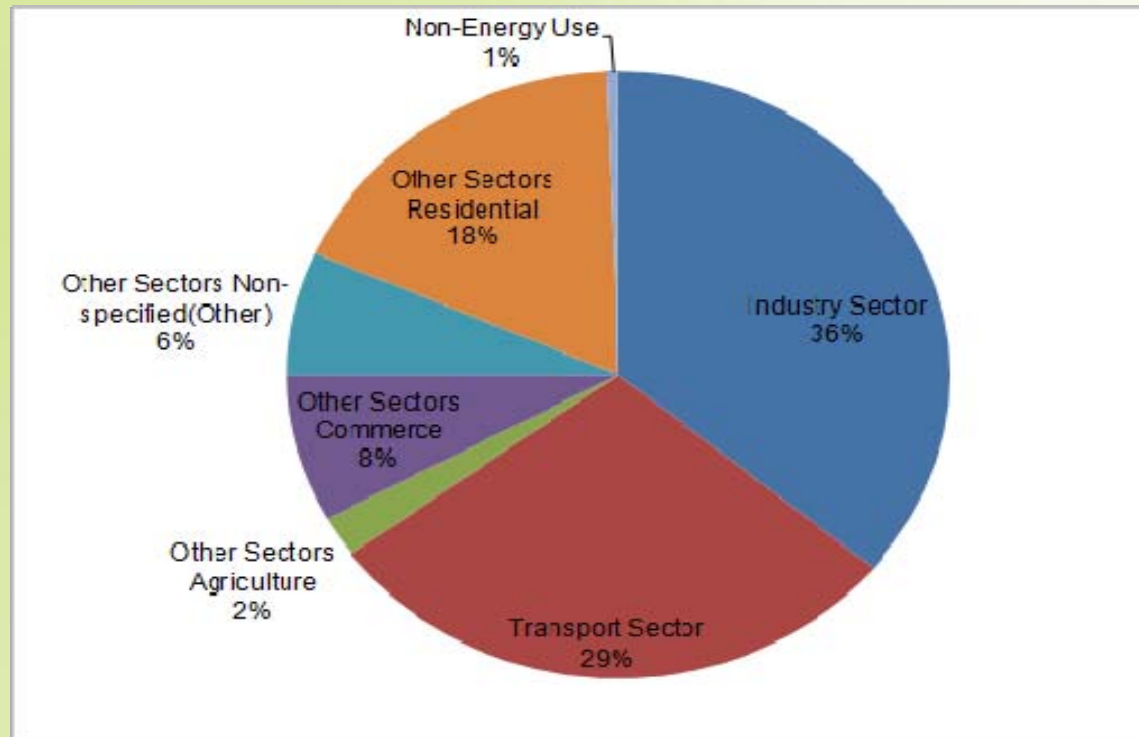
The Industrial sector is the largest consumer of the final energy in the country. The sector may be subdivided into mining, iron and steel, chemicals, non-ferrous metals, non-metallic minerals, pulp and paper, food and tobacco, and other.



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# Final Energy Demand by sector



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# Energy and the Economy

- The energy intensity of the county shows how much energy is needed to produce a single unit of GDP. High energy intensities indicate a high price or cost of converting energy into GDP. Low energy intensities indicate a lower price or cost of converting energy into GDP
- South Africa's energy intensity is above average, with only 10 other countries having higher commercial primary energy intensities (EIA, 2010). This is largely due to the economy's structure with dominating large-scale, energy-intensive primary mineral beneficiation and mining industries



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# Energy and Carbon Emissions

- The highest proportion of carbon is contained in the coal which is locally produced. Some of this coal is exported along with small quantities of petroleum products.
- The most significant emitters of carbon are the generation of electricity, liquefaction and refining processes
- All the carbon contained in coal used electricity generation is released at the power plant.
- For the transformation of coal and crude oil to petroleum products some of the carbon is emitted at the synfuel and refinery plants but the petroleum products coming out of these processes also contain carbon. This carbon is released at the port at final consumption



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# Challenges

- Energy Balances
- Demand Projections/Supply optimization
- Carbon Emissions



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# Thank you



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