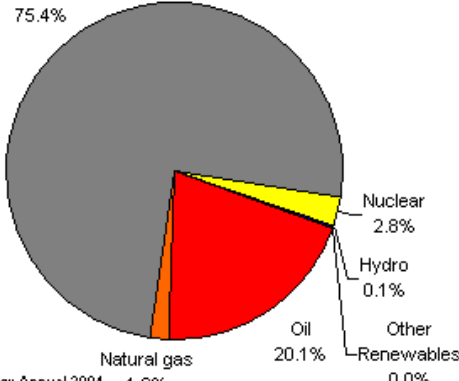
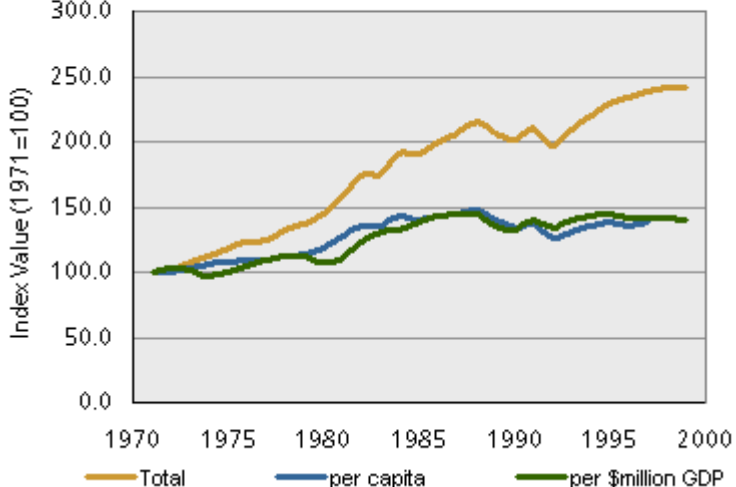


**Team Project Guidance**  
**Energy Choices around the World**

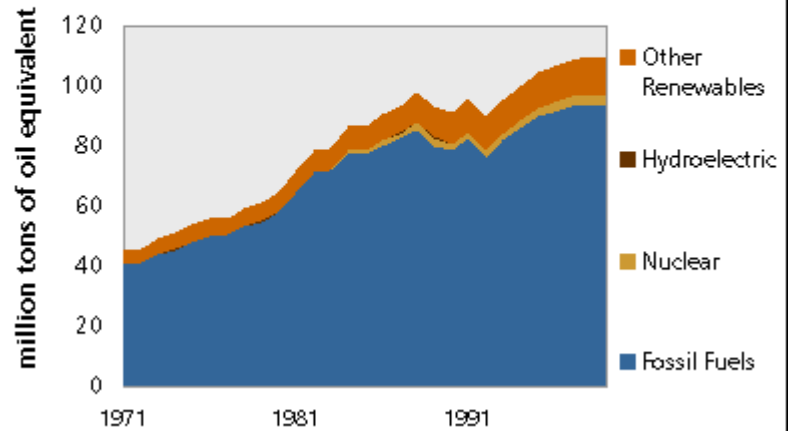
**Team Members: Christine D., Matt T. Annie K., Colleen J.**

<i>Point for Consideration</i>	<i>Country</i>
<p>➤ What are the main sources of energy used in the country?</p>	<p style="text-align: center;"><b>Total Energy Consumption in South Africa, by Type (2004)</b></p>  <p style="text-align: center;">Source: EIA International Energy Annual 2004</p>
<p>➤ Describe the breakdown of energy production versus consumption in the country.</p>	<p><i><b>Largest consumer and second largest producer in the country.</b> South Africa is a significant coal exporter but imports large amounts of oil and some natural gas. The country has a highly developed synthetic fuels industry that uses coal, condensate and natural gas as feedstock. Only a small percentage of the energy consumption mix is comprised of natural gas and nuclear.</i></p>
<p>➤ Describe the per-person energy usage averages among the population of the country.</p>	<p style="text-align: center;"><b>Energy Consumption: Relative trends, South Africa, 1971-1999</b></p> 

<p>➤ What types of renewable energy sources are available for public and for what purposes?</p>	<p>- Solar. South Africa experiences some of the highest levels of solar radiation in the world and although tourist brochures refer to “sunny South Africa”, solar energy currently provides only about 10% of the country’s primary energy needs; but solar power has tremendous potential and is the fundamental component of the country’s rural energy program where millions of people do not have access to the national grid;</p> <p>-Hydro power. Again both small scale and large hydro generators have potential in SA but currently less than 1% of electricity generated in South Africa comes from hydro-electric power;</p> <p>- Wind energy. Finally a number of experimental wind farms have been built and is also suited to both small-scale battery charging systems as well as large scale wind-farms</p> <p>-Biogas and landfill gas account for a small but fast-growing share of the energy supply. Biomass (in the form of firewood, wood waste, dung, charcoal and bagasse). It similarly accounts for about 10% of net national energy use and for 60% of household energy consumption;</p> <p>* The energy content of the total domestic and commercial waste sent to landfills in South Africa is estimated to be around 11,000 GWh/annum</p> <p>* The net realizable energy from sewage waste is estimated to be in the order of 800 GWh/annum</p> <p><b>Marine</b></p> <p>There is some potential for electricity generation from waves where annual average off-shore wave power levels are up to 50 kW/m of wave crest off the southern cape.</p>
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➤ Describe the breakdown of renewable versus non-renewable energy resources in the country.

**Energy Consumption by Source, South Africa, 1971-1999**



➤ Describe energy conservation plans under consideration in the country.

The government has committed to generating 4% of its power from renewables by 2012.

While the cost of electricity in South Africa is among the world's lowest, the country's strong economic growth, rapid industrialization and a mass electrification program led, by early 2008, to demand for power outstripping supply.

As a result, state energy company Eskom has embarked on a massive program to upgrade and expand the country's electricity infrastructure.

These plans include spending a projected R343-billion over five years to fund a new generation of power stations, with the first due to come on stream in 2013. Eskom has started work on two new coal-fired power stations, and is considering bids from two overseas companies to build a new conventional nuclear power station.

Eskom also plans to reopen three power stations that were mothballed in the 1990s, build two open-cycle gas turbines that will produce power by the end of 2009, and complete a hydro scheme in the Drakensberg in KwaZulu-Natal.

<p>➤ Describe the current and future energy concerns for this country.</p>	<p>The only country that makes any significant amount of synthetic fuel is South Africa, whose apartheid government was forced to find an alternative to petroleum in the 1970s during a trade embargo. “The technology exists, but it’s costly and creates environmental problems.</p> <p>Energy contributes about 15% of South Africa's gross domestic product (GDP). Eskom is one of the world's 10 biggest electricity generators, and is in the top 11 in terms of sales. It generates around 95% of the electricity used in South Africa, as well as exporting power to other African countries.</p> <p>Nuclear energy-Eskom plans to double its total generating capacity to 80 000MW over the next two decades, with nuclear power making up about half of the new capacity.</p>
<p>➤ Summarize the positives and negative aspects of the country’s overall energy usage, production, policies, and plans</p>	<p><b>South Africa is the 14th highest emitter of greenhouse gases.</b> However, the country is committed to reducing emissions, and is a signatory to the UN Framework Convention on Climate Change and the Kyoto Protocol. Eskom has said it is committed to reducing coal's current 88% share of South Africa's primary energy mix to 78% by 2012 and to 70% by 2025.</p> <p>Sasol, the biggest local company listed on South African stock market the JSE, produces synthetic fuels from low-grade coal and a small amount from natural gas. It operates the world's only coal-based synthetic fuels facility, and produces 36% of liquid fuels consumed in South Africa.</p> <p>Cape Town harbour's infrastructure is well suited for oil rig repair and maintenance - there were four drilling rigs in for work in February 2008 - and construction of South Africa's first fabrication yard for offshore oil and gas platforms was completed at Saldanha Bay in late 2007.</p> <p>“<i>National Energy Emergency</i>” On January 9, 2008, a power shortage shut down South Africa’s critical mining sector for five days. <b>Background</b> South Africa has benefited from an</p>

	<p>abundant and cheap supply of electricity since the founding of the monopoly public utility, the Electricity Supply Commission, or Eskom, in 1928. The act establishing the monopoly mandated that electricity be sold at cost. Artificially low labor costs under apartheid, combined with South Africa's large reserves of coal, enabled Eskom in effect to subsidize industrial development and to become a surplus producer, ultimately exporting electricity to neighboring countries. The low cost of South Africa's electricity has deterred foreign power companies from entering the market. As a result, Eskom supplies 95% of the country's power. The African National Congress governments since 1994 have expanded service to rural areas and townships and successfully pursued policies to increase GDP growth. There were warning signs a decade ago that demand would exceed supply at about the time that this in fact happened. The trade and foreign investment has also been affected by the crisis.</p>
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