



## **Energy and Mining**

*The Impact of One on the Other*

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**SANEA Business Breakfast Meeting**

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**exxaro**

**POWERING POSSIBILITY**

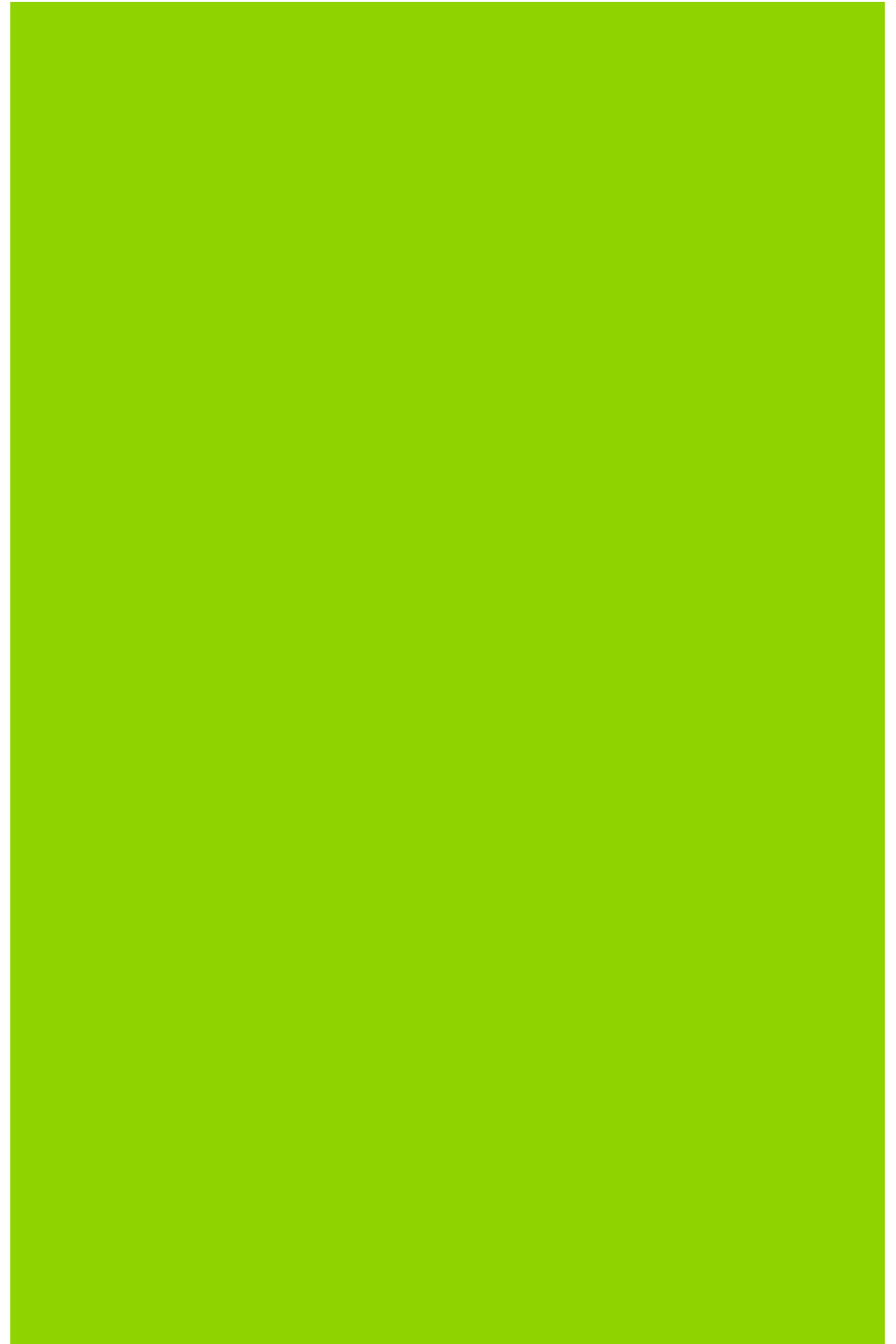


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# Energy in the World

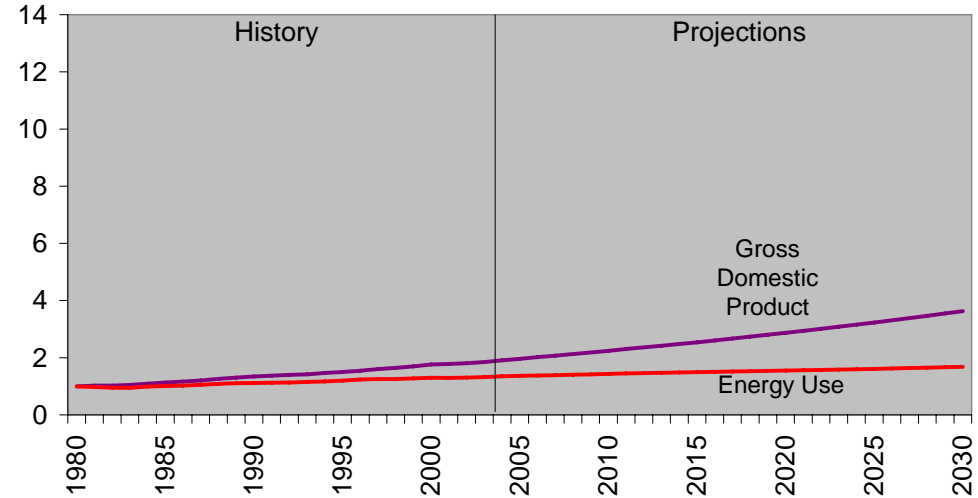




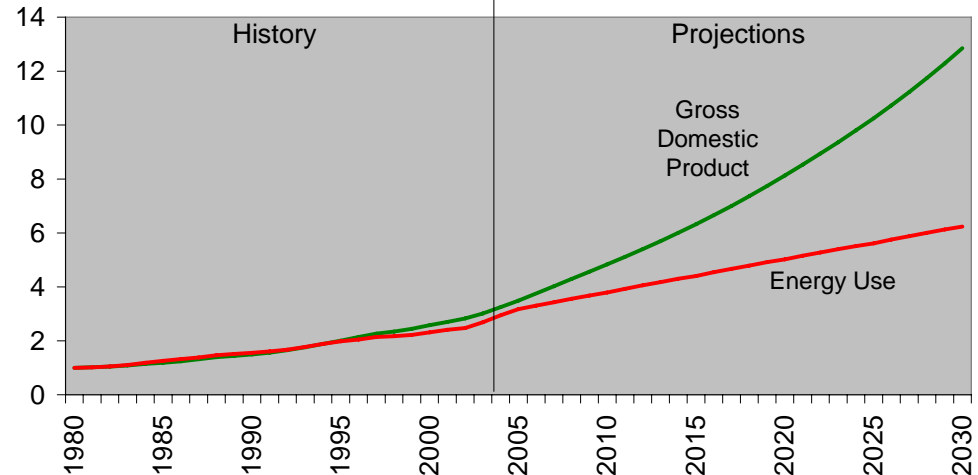
# Growth, Development and Energy Demand

- Energy is the fuel for growth, one of the requirements for economic and social development.
- The link between energy demand and GDP growth is relatively weak in the OECD nations, *but in non-OECD regions (which includes SA), economic growth in the short term will still correlate with energy demand.*

Growth in Energy Use and GDP for OECD Economies  
Index, 1980=1



Growth in Energy Use and GDP for Non-OECD Economies  
Excluding Non-OECD Europe and Eurasia  
Index, 1980=1



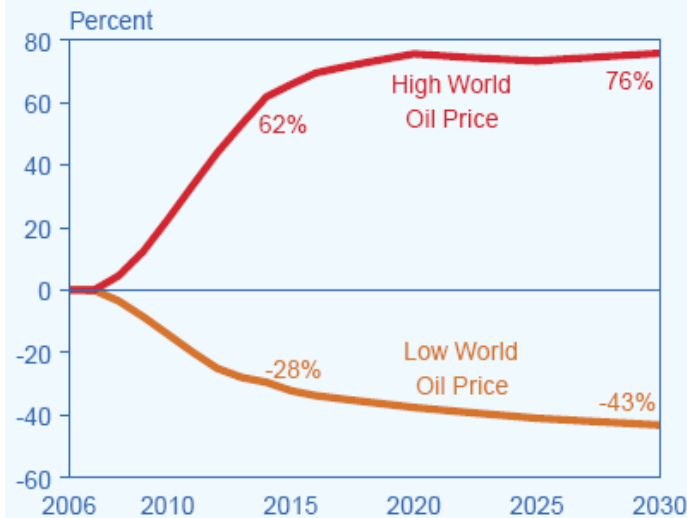


# Impact of Energy Prices on World Economy

## The Oil Scenario

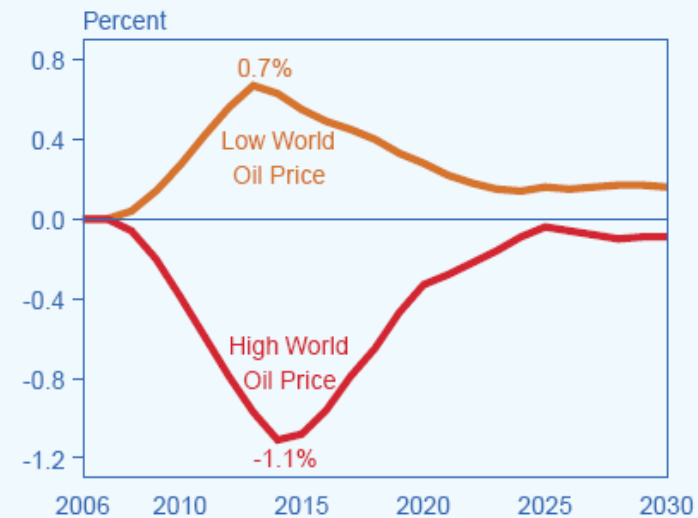
- Increased oil prices have a negative effect on world GDP;
- Impact most severe in oil-importing countries with export-dependant economies;
- Impact positive only in oil-exporting countries (Saudi Arabia, Russia).

Differences from Reference Case World Oil Price Projections in the High and Low World Oil Price Cases, 2006-2030



Source: Global Insight, Inc., Global Scenario Model (February 2007).

Differences from Reference Case World Real GDP Projections in the High and Low World Oil Price Cases, 2006-2030

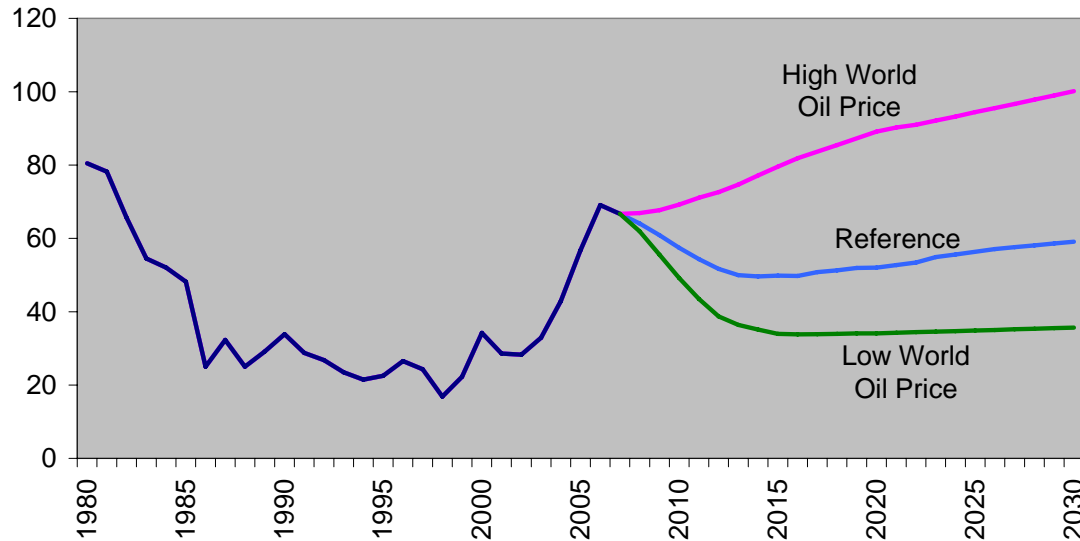


Source: Global Insight, Inc., Global Scenario Model (February 2007).



## The Way Forward for Energy Prices

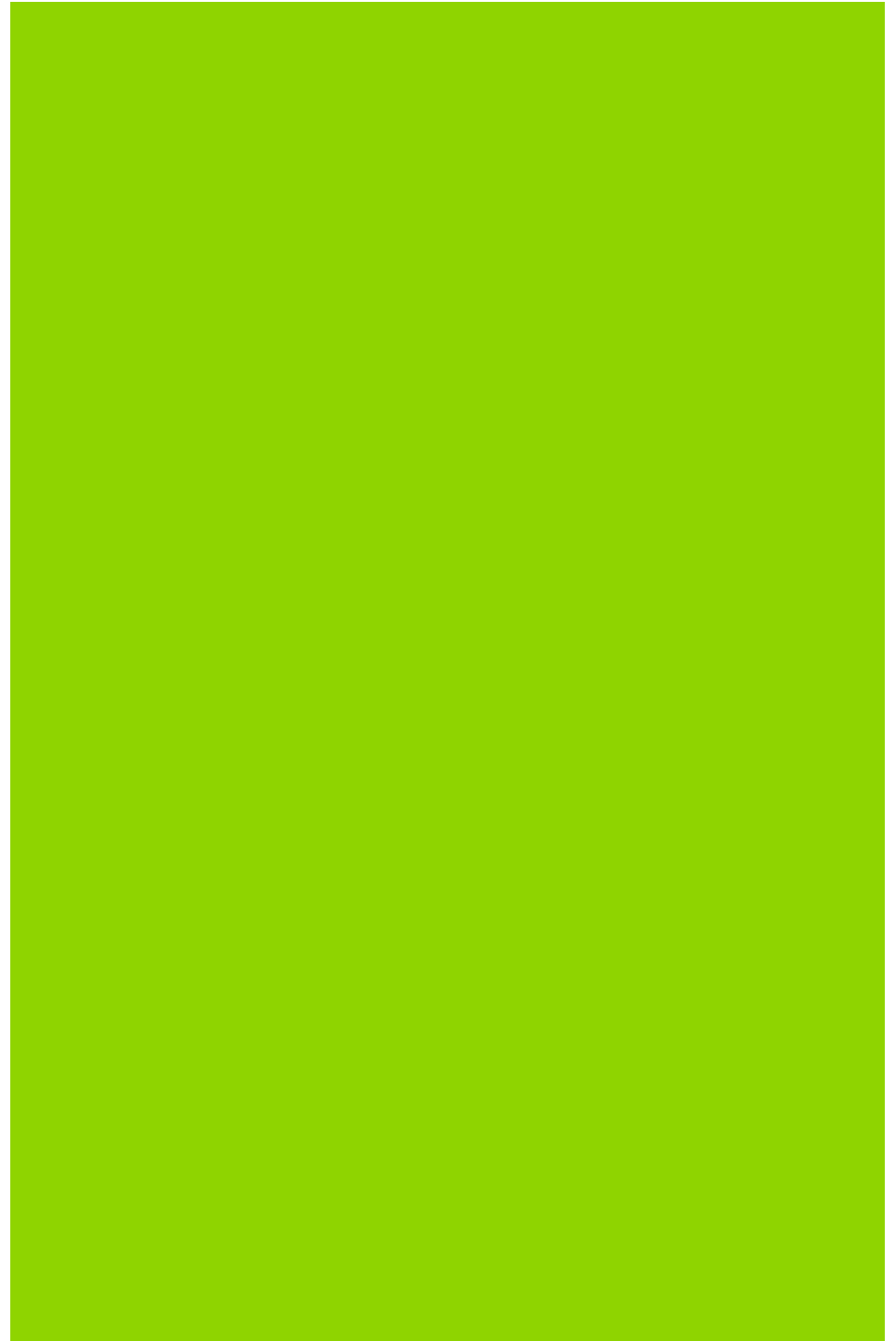
World Oil Prices in Three World Oil Price Cases  
2005 Dollars per Barrel



- The most significant impact of lower or higher oil prices will be on the mix of energy fuels consumed.
- More of coal, nuclear and renewables in a high oil price scenario....?



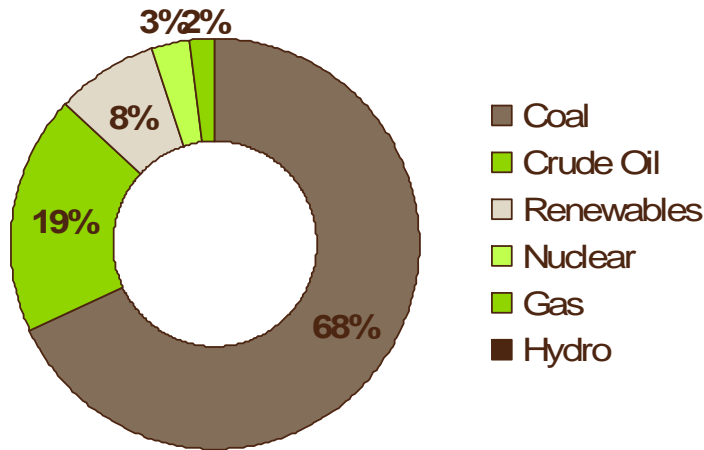
# Energy in South Africa





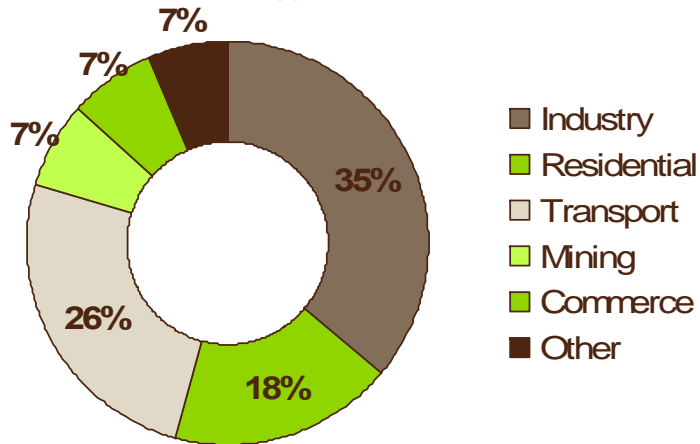
# Energy Supply and The Mining Sector's Consumption

Primary Energy Supply, 2004



- Coal remains the biggest contributor to primary energy supply (68%) in South Africa

Sectoral Energy Consumption, 2004



- 88% of electricity is produced from coal
- In terms of total energy consumption, the mining sector itself accounts for 7%



## Energy Prices in SA - Electricity

- To fund Eskom's expansion programme (higher energy demand and to increase reserve margin) and because of higher primary energy costs, price increases are inevitable
- Current application for real tariff increases comprises of:
  - 53% increase in 2008/09
  - 43% increase in 2009/2010

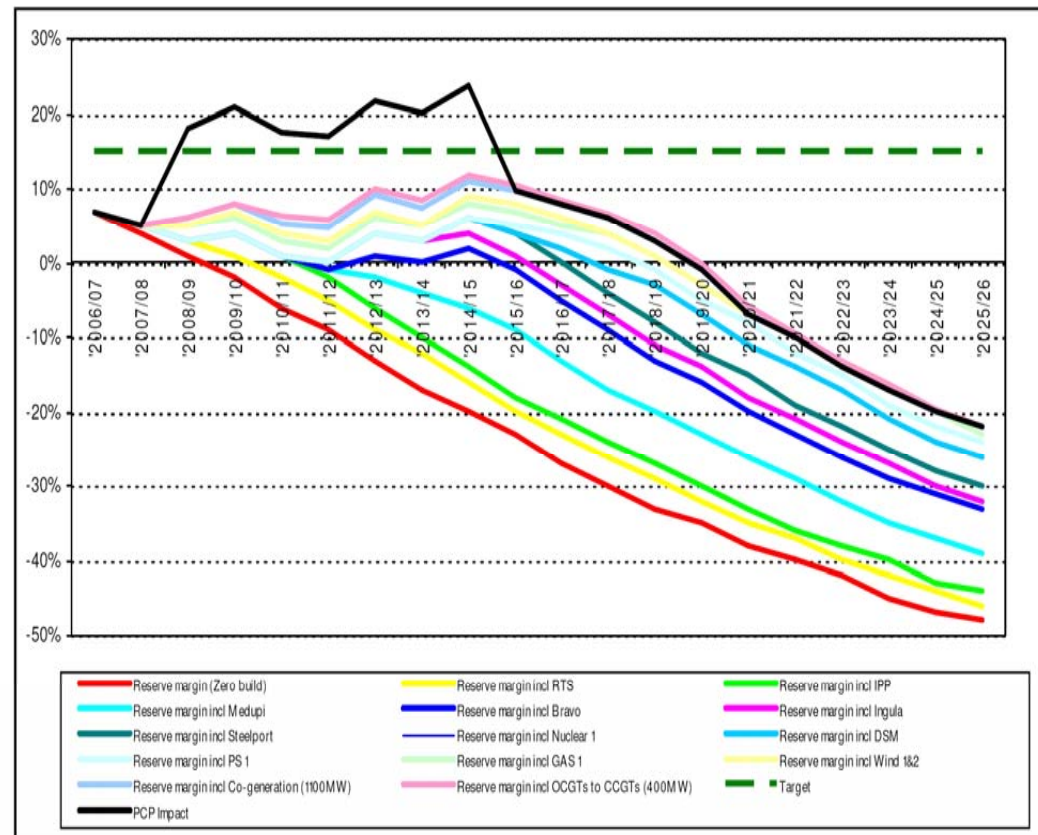
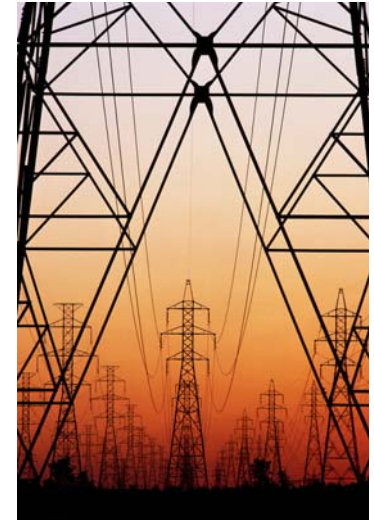


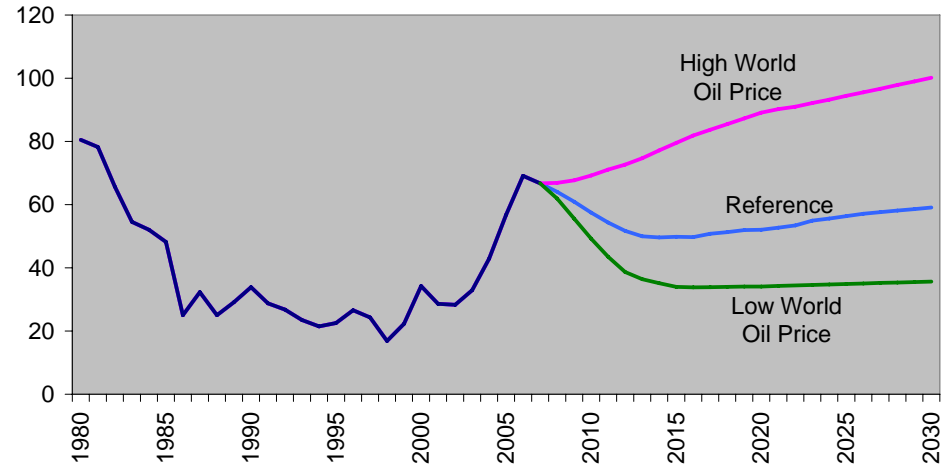
Figure 2: Capacity reserve margin



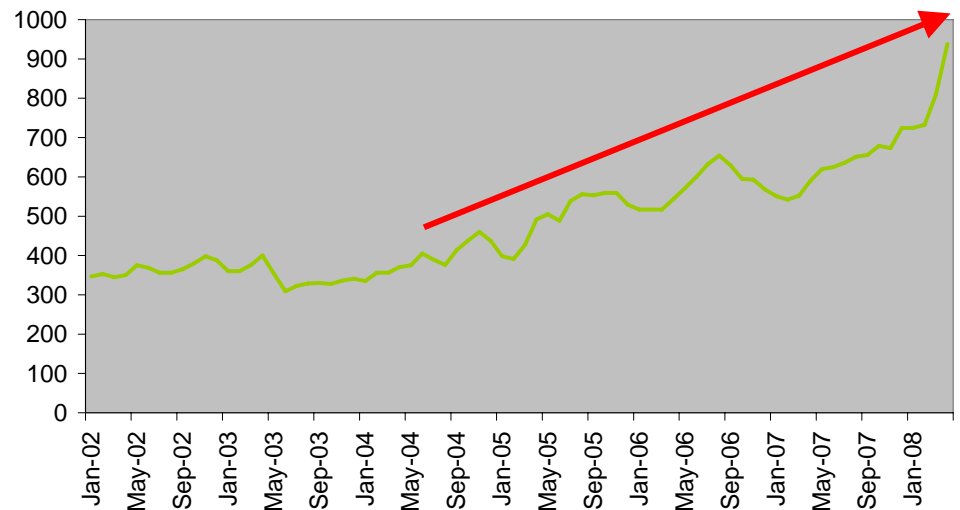
# Energy Prices in SA – Petroleum Products

- The price of petroleum products is influenced by:
  - international crude oil prices
  - international supply and demand balances for petroleum products and
  - the Rand/US Dollar exchange rate.
  
- The pressure will continue...

World Oil Prices in Three World Oil Price Cases  
2005 Dollars per Barrel

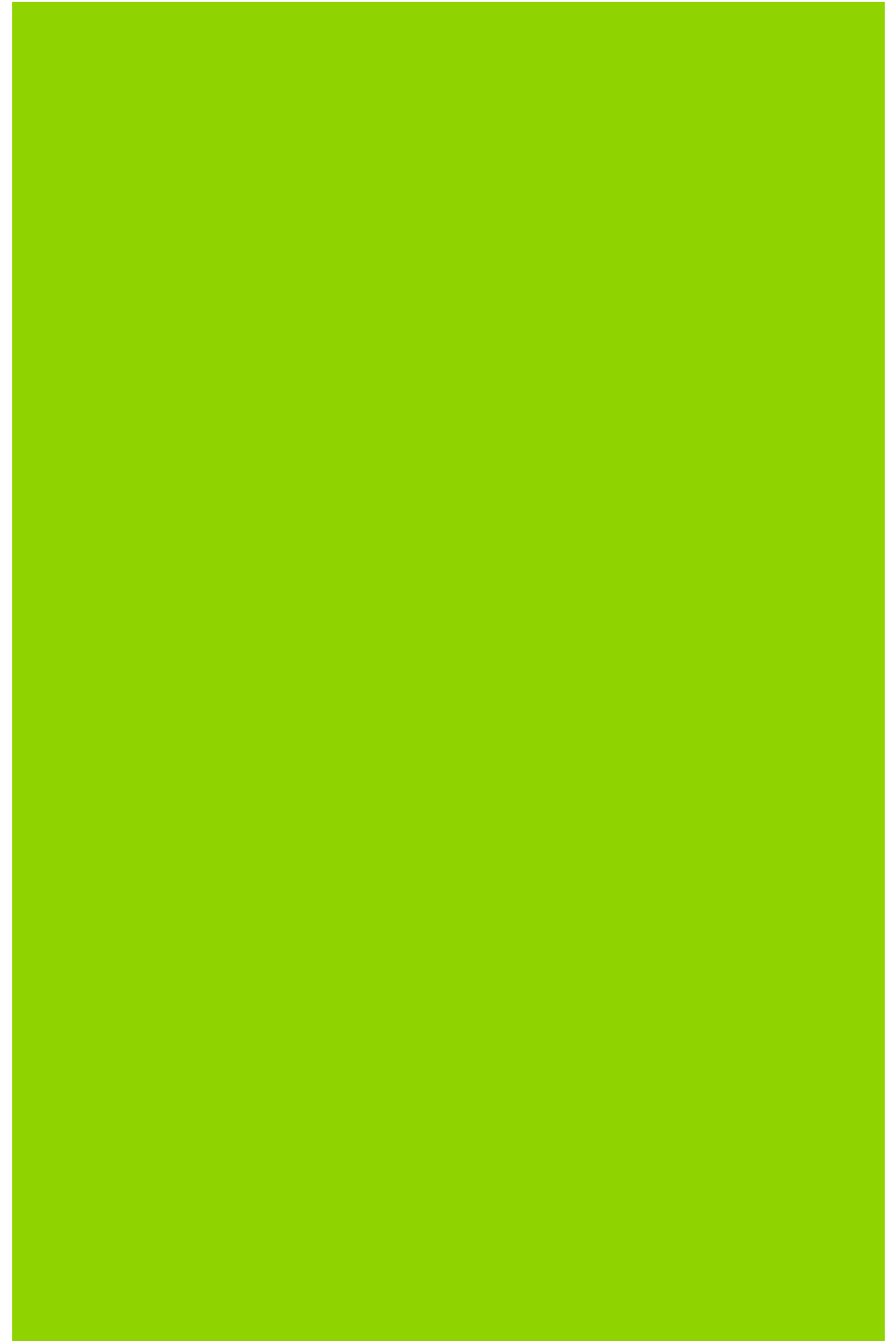


Nominal Diesel Price (c/l)





# Mining in South Africa





## Mining's Contribution to SA Economy

### The South African Mining sector in 2006...

- **Accounted for 7% of Gross Domestic Product (GDP);**
- **Contributed R140-billion to exports, 25.2% of the country's foreign exchange earnings;**
- **Continue to attract investment, accounting for R1.6-trillion, 31.2% of the value of the Johannesburg Securities Exchange;**
- **Employed an average of 458,600 workers. An estimated five million people depend on mine employees for their daily living;**
- **Concluded R24-billion worth of empowerment deals.**



## Mining's Energy Demands

### DEMAND

- ***Electricity***  
In 2006 the mining industry consumed 31,800 gigawatt hours – 15.3% of Eskom's sales
- ***Diesel and Petrol***  
In 2006 the mining industry consumed 762 million litres – 9% of the total amount of diesel used in South Africa,  
  
and less than 1% of the total amount of petrol used in South Africa

### ON THE FLIP SIDE

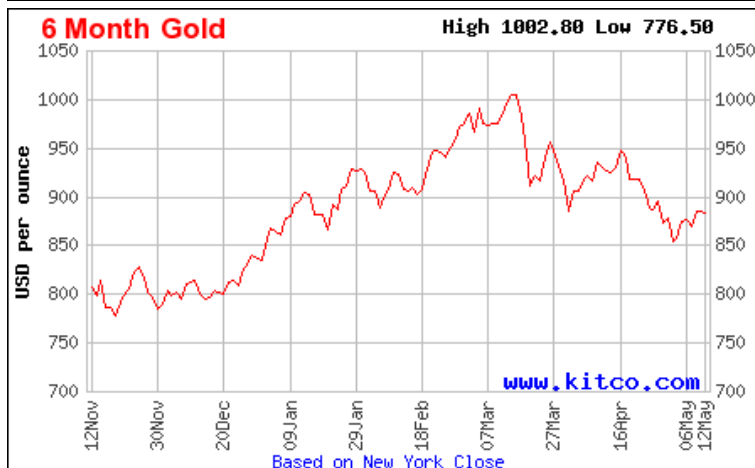
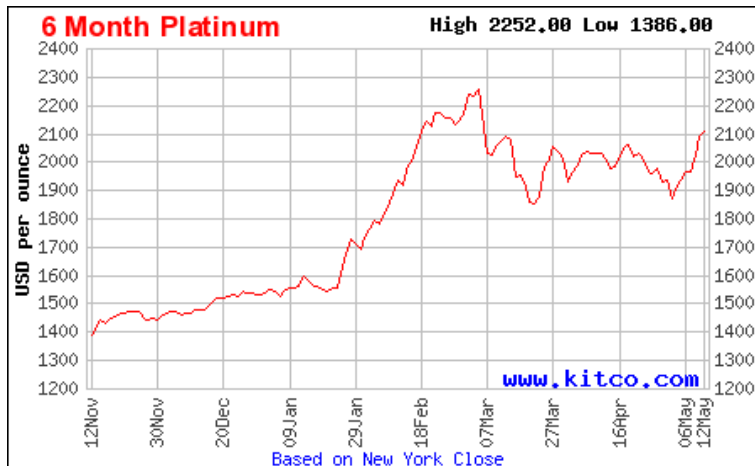
112 million tons of coal was mined and used for electricity generation, ~93% of electricity generated in South Africa

43.7 million tons of coal was mined and then converted into synthetic fuels, accounting for 37% of local liquid fuel supply



## The Lack of Energy

- Impact of electricity crisis January 2008:



- BUT.....

- Huge losses in production.

90% electricity  $\neq$  90% production (especially in underground mines, safety cannot be compromised), estimates nearer to 75-80%.

- Loss in production = Loss in profit, fears of job losses

- On y-o-y basis mining production in January 2008 fell by 10.7%.

- March 2008 – electricity supply up to 95%.



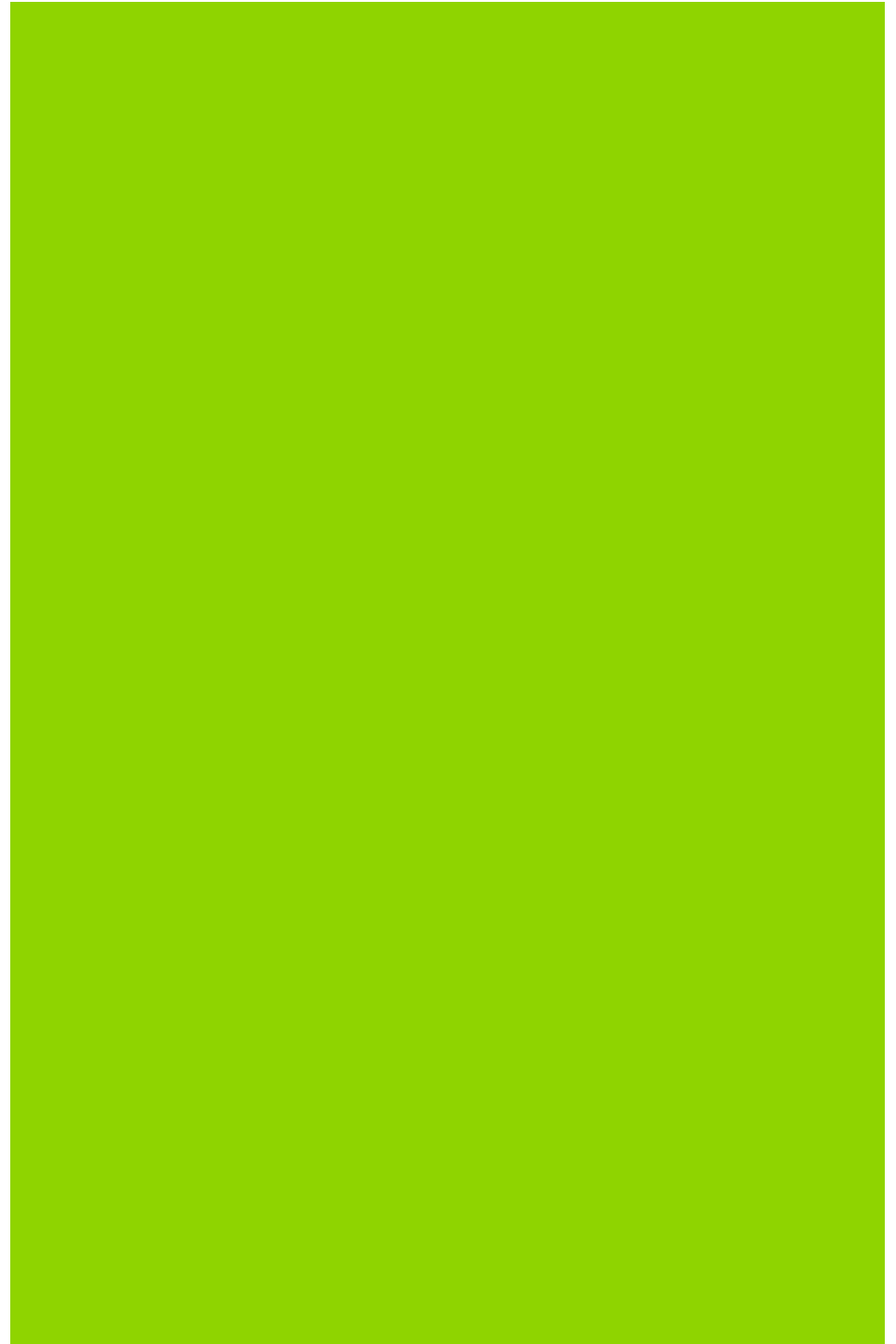
## The Price of Energy

- PPI for March 2008 – Mining and Quarrying amounts to 17.1%
- Ever increasing labour, energy and other input costs
- Higher oil prices directly impacts on hauling and road distribution costs
- Ever increasing margin squeeze





# Opportunities

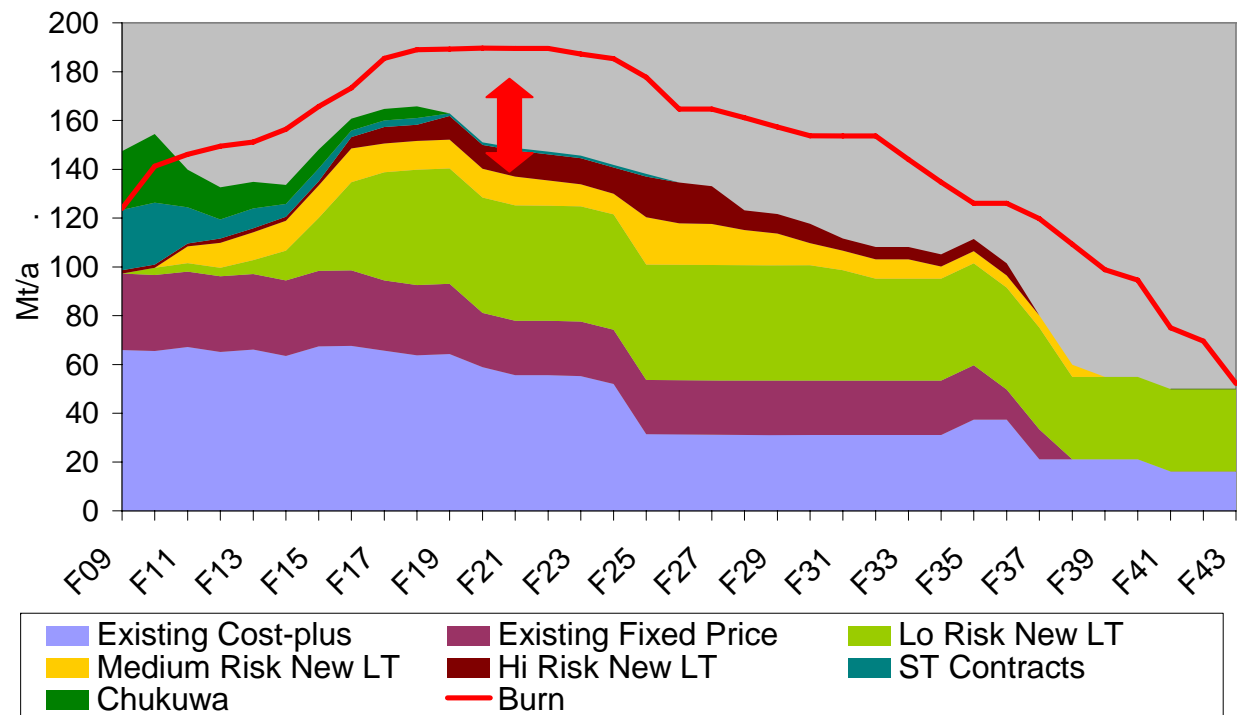




## Energy Efficiency – Demand Side

- Demand side management include:
  - Stopping all non-essential energy usage
  - Projects to reduce electricity consumption e.g. energy efficient pumps and motors, lighting, optimisation of maintenance schedules, etc, etc.

■ But is this enough?





## Supply Side



- **Optimise current asset base:**
  - **Access better quality coal feed stocks**
  - **Ensure optimal availability and utilisation of current power stations**
  
- **Future asset base:**
  - **Fast-track current build program**
  - **Fast-track alternative feed stock projects**
  - **IPP agreements**



## Other Options

- **Load shifting – working together with the community**
- **Co-generation**
- **Bio-fuels**
- **Own electricity generation**
- **Renewables**





## Is Mining Wasting Energy?

- Over-designing vs ■ Right-sizing
- Bulk handling vs ■ Value-adding before transporting
- Taking ROM to processing vs ■ Bringing the processing to the ROM



## Conclusion

**Without energy there will be no mining.**

**Without mining there will be little energy.**

**We need to be creative.**

*We can't solve problems by using the same kind of thinking we used when we created them*

*Albert Einstein*

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**THANK YOU**