



***Conversions of Coal & Gas to Liquid Fuels -
Developments in South Africa***

A. Zwiigelaar

sasol
reaching new frontiers





World Oil demand

RSA Liquid Fuels Market Gap

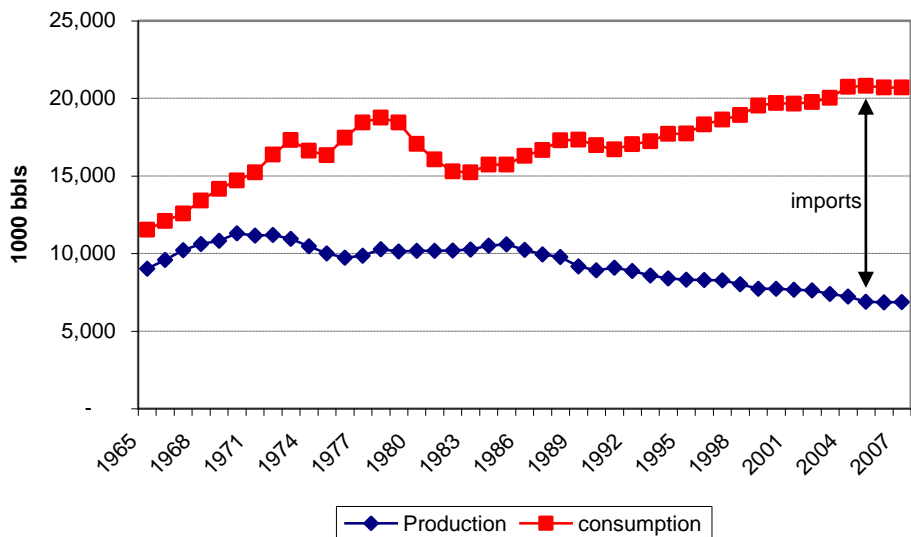
Options to address energy security

Benefits & challenges of a CTL

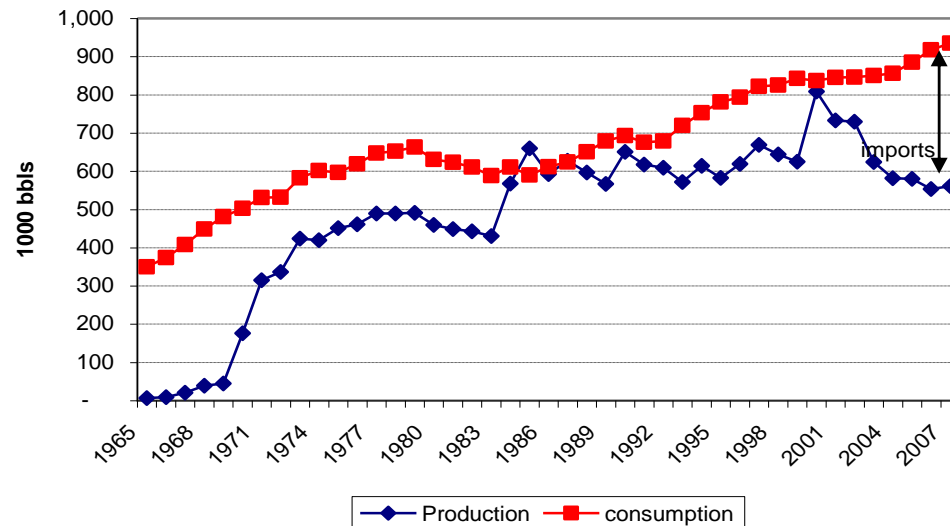
An ever increasing competition for oil resources



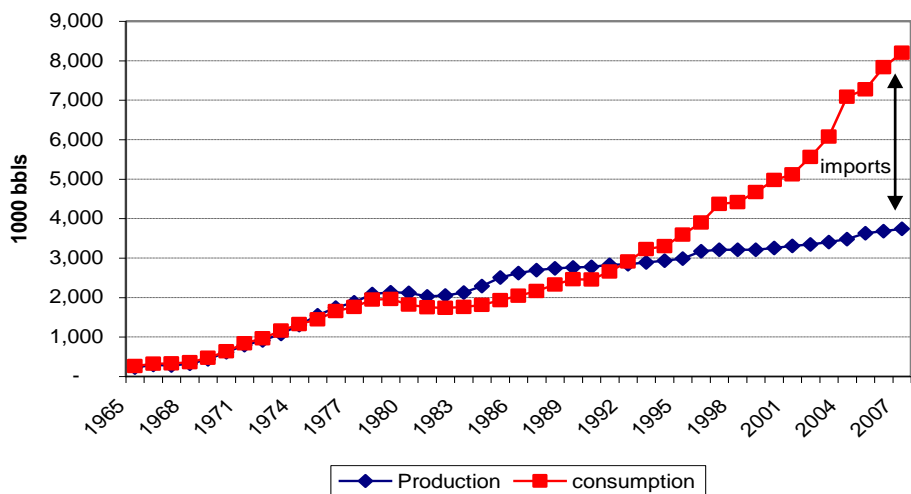
USA



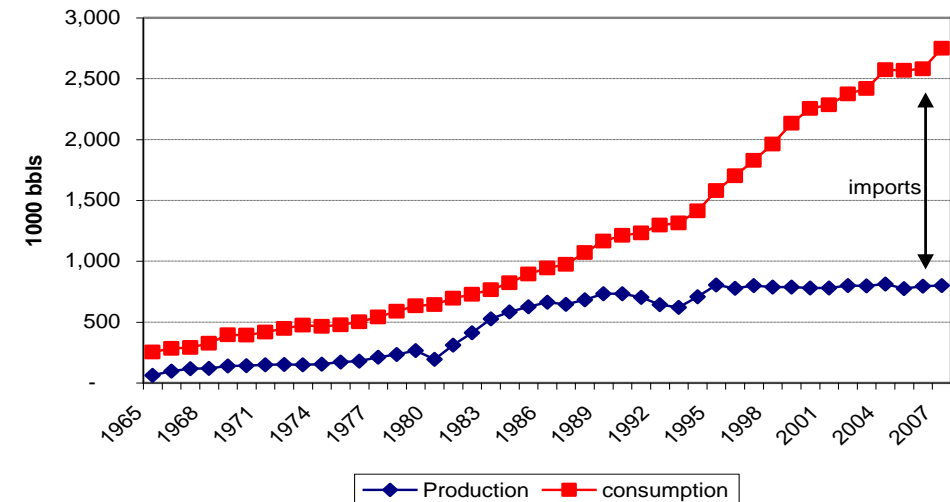
Australia



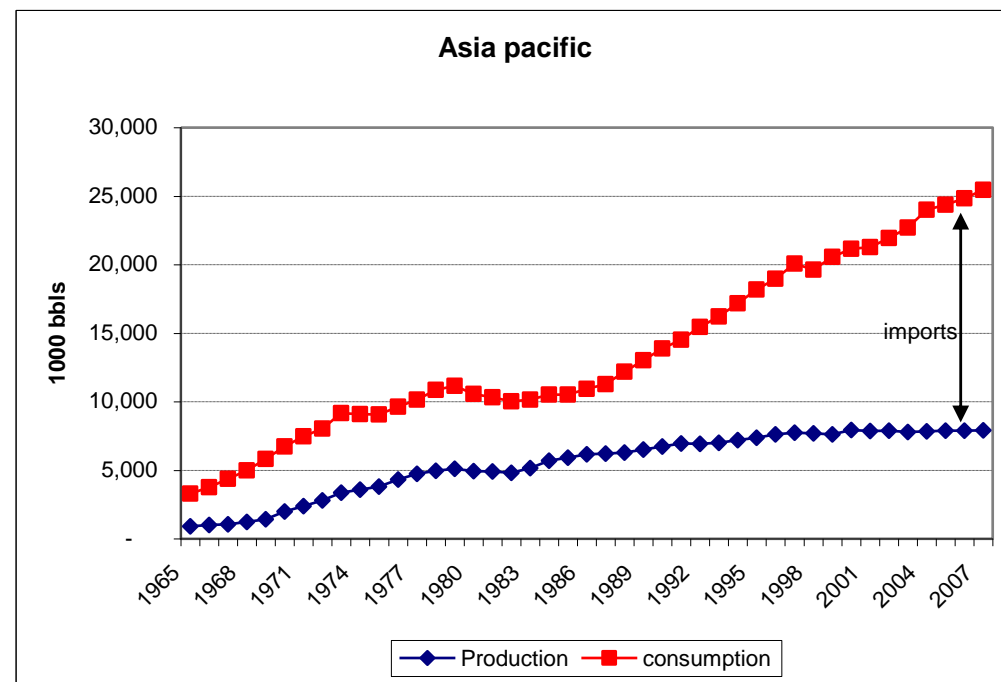
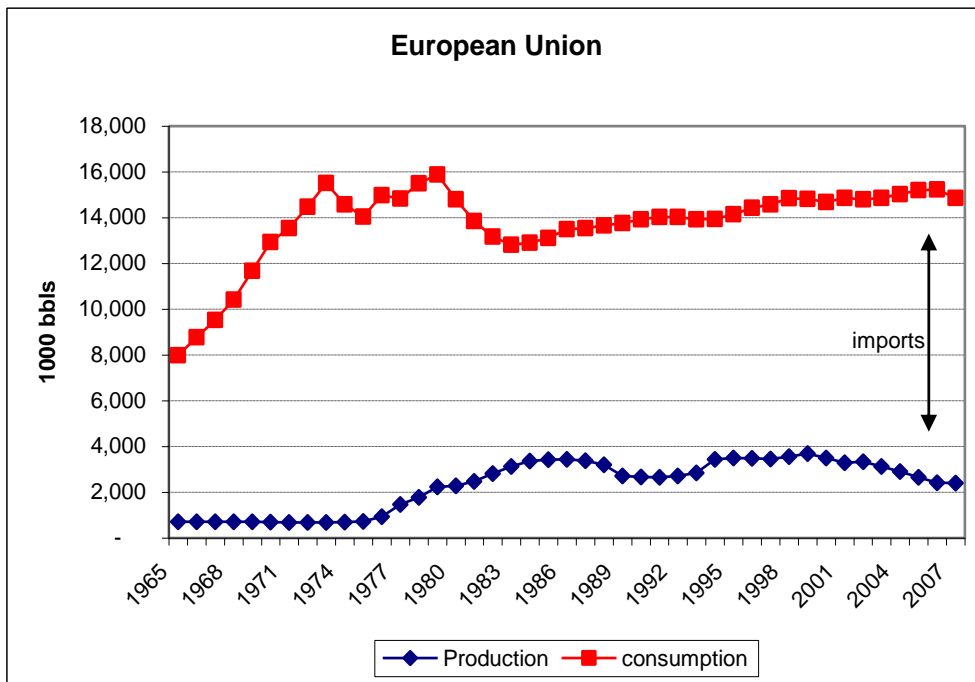
China



India



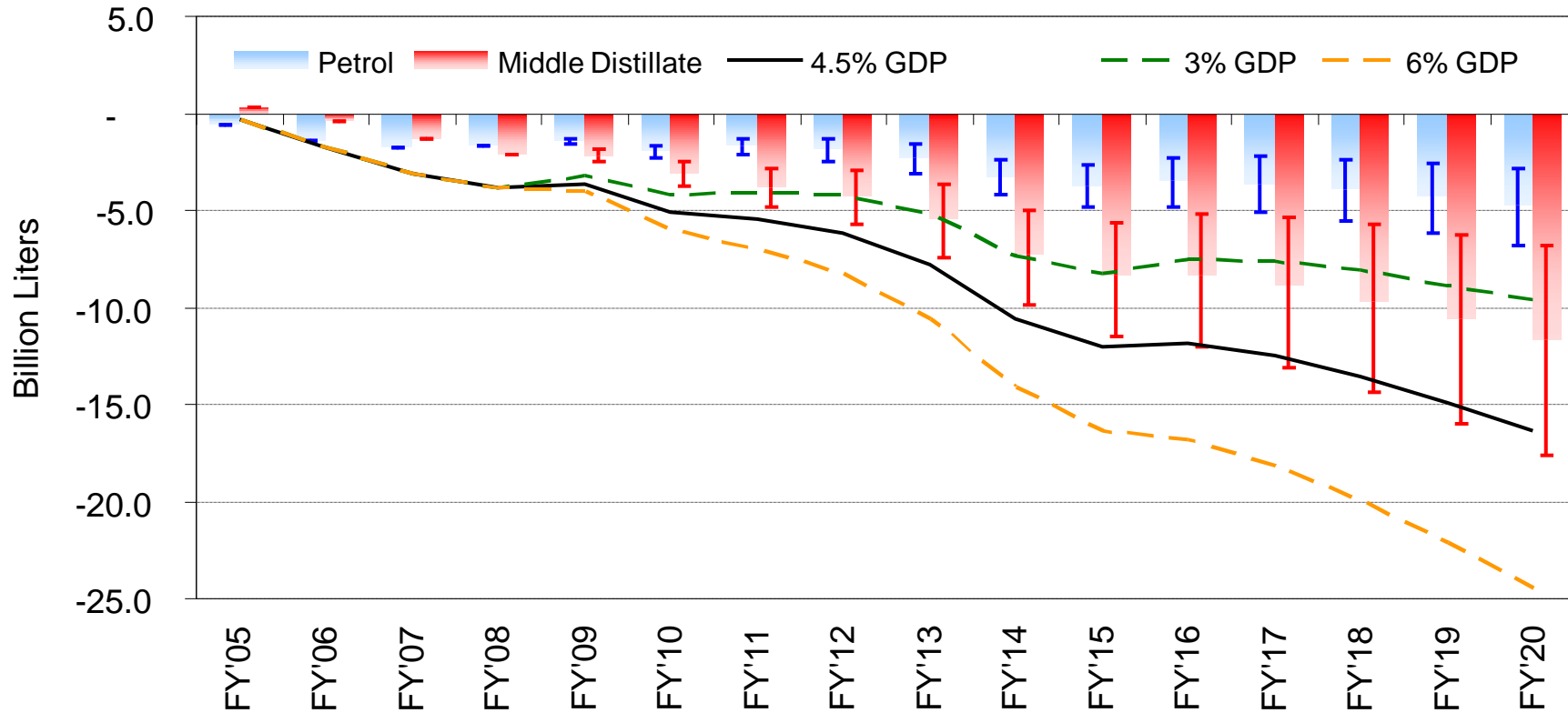
An ever increasing competition for oil resources



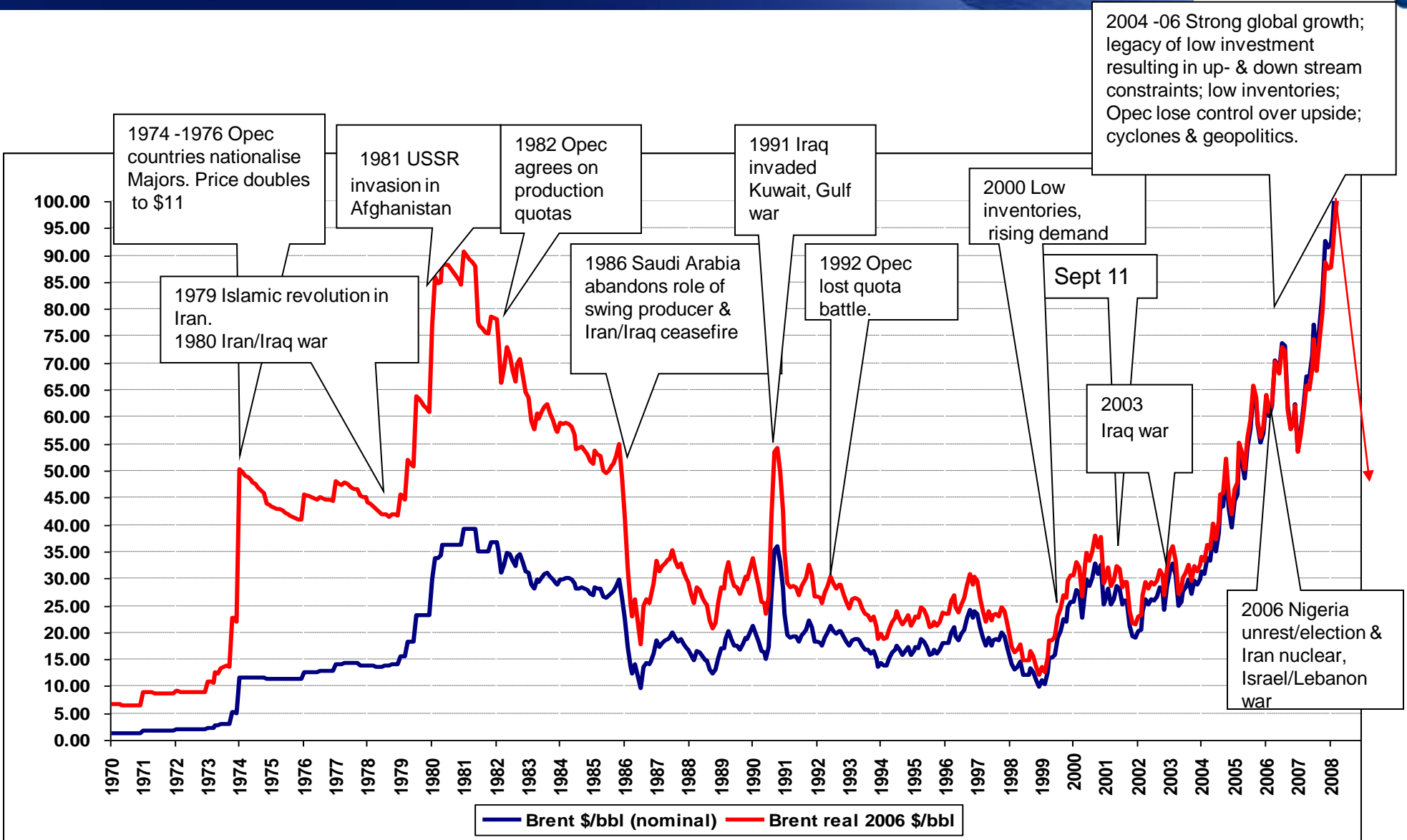
South African Fuel demand and supply (SA a net importer of fuel)



Existing SA refiners in South Africa – neither capacity expansion nor refinery closure



Historic volatile oil prices



A variety of options are available to close a fuel supply/demand imbalance



We can import refined product

It exposes us to supply risks in terms of product availability and transportation

Current account implications

It will not improve South Africa's energy security

We can expand our coastal crude oil refineries or invest in a new one or invest in biofuel

Built-up residential areas

Located in sensitive environmental areas

Current account implications

Increasingly expensive to import the correct crude oil

South Africa's energy security marginally improved

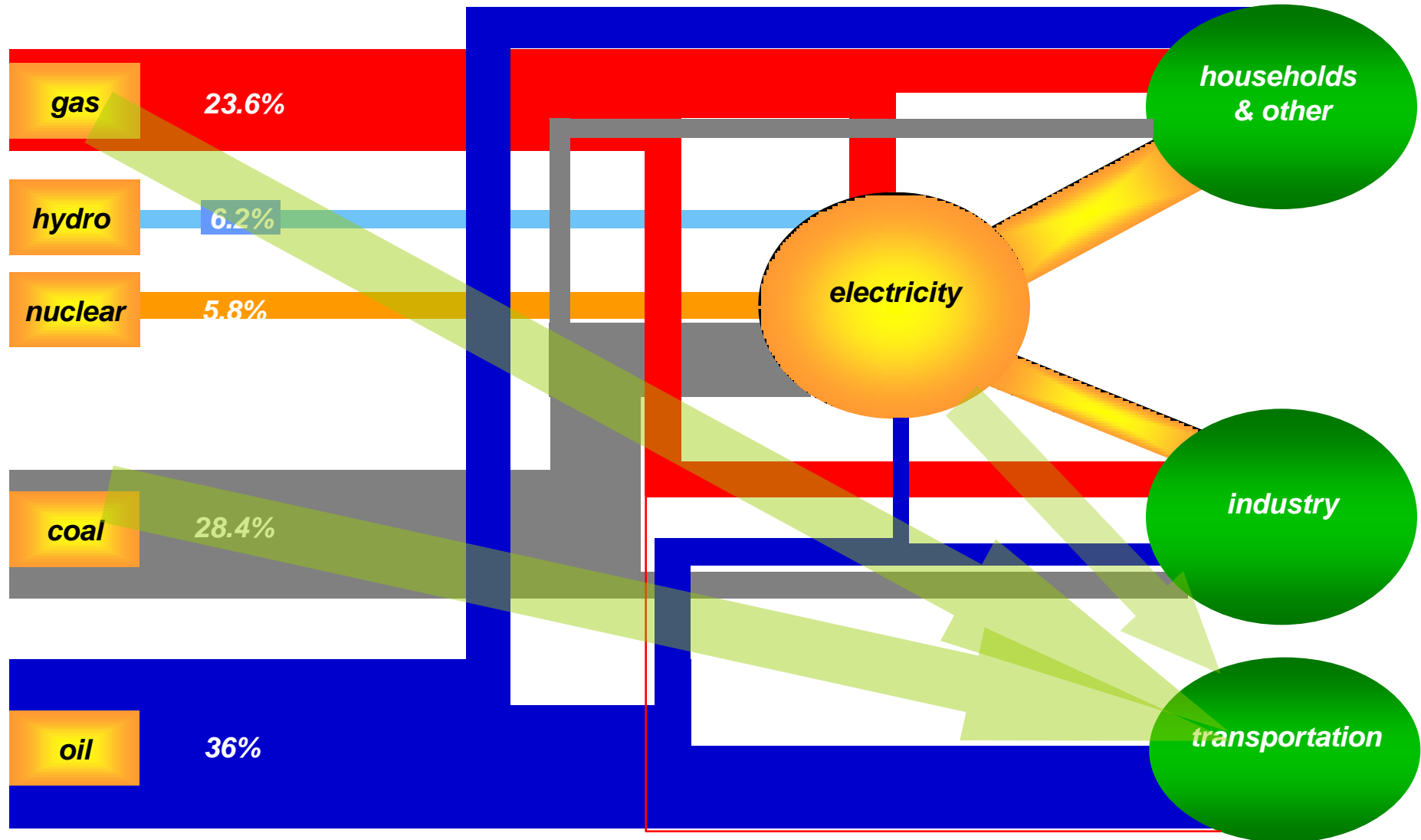
•Biofuel investment will improve but not totally close the fuel demand gap – impact on food inflation

We can invest in SA's competitively advantage in Coal/Gas-to-Liquids technology

Coal/Gas-to-Liquids provides energy security and contributes significantly to the economy

Although local investment is a preferred option we also strive to capture international opportunities

The world's energy market is segregated: CTL and GTL provide opportunity for arbitrage



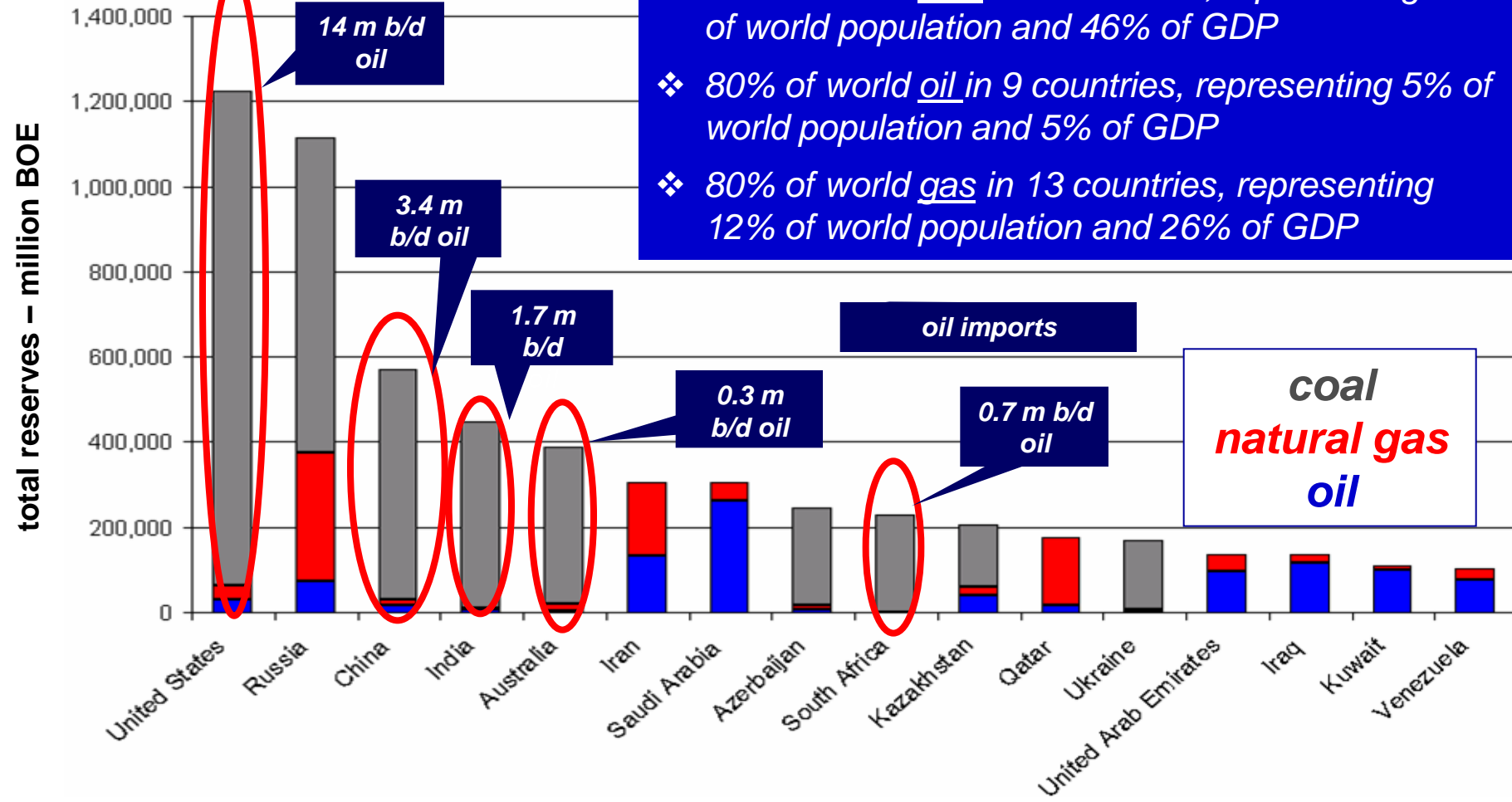
Total = 10 878.5 million tons oil equivalent per annum

Sources: Energy Information Administration, BP Statistical Review of World Energy 2006, New Scientist-world energy use

gas and coal resources beat oil for energy security creating opportunities for gas and coal-to-liquids



- ❖ 80% of world coal in 6 countries, representing 45% of world population and 46% of GDP
- ❖ 80% of world oil in 9 countries, representing 5% of world population and 5% of GDP
- ❖ 80% of world gas in 13 countries, representing 12% of world population and 26% of GDP



Source: BP Statistical Review of World Energy

Listed on JSE in South Africa and NYSE in USA

Market capitalisation of over US\$ 39bn (2008)

Pioneer in gas-to-liquids (GTL) and coal-to-liquids (CTL) technology

World's largest producer of synthetic fuels

Current production capacity

Coal [mostly for conversion into fuels] - 43 million tons per annum (mtpa)

Liquid fuels [from coal & gas] ~ 7,5 mtpa (160 000 barrels per day (bpd))

Liquid fuels [from crude oil] ~ 3,5 mtpa (108 000 bpd)

Gas to liquids projects being developed outside SA

Oryx GTL in Qatar in operation

Escravos GTL in Nigeria under construction



- **Domestic turnover R67 billion in 2008**
- **Indirect and induced influence of Sasol on GDP amounted to combined contribution of about R64b or 4,71% of national GDP in 2005**
- **Our influence on national employment amounted to 198 211 jobs (30 457 direct, 5 240 indirect and 116 514 induced) in 2005**
- **Sasol's activities enabled the South African Government to generate annual revenue of about R18 billion in 2005**
- **Exports accounted for about 2% of all goods and services exported from South Africa**



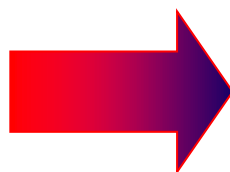
resource



natural
gas



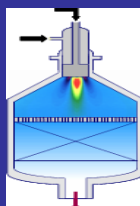
coal



enabler



coal
gasification



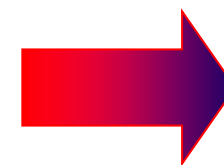
gas reforming



Fischer Tropsch
process

FT fuel
refining &
blending

Chemical
extraction &
distillation



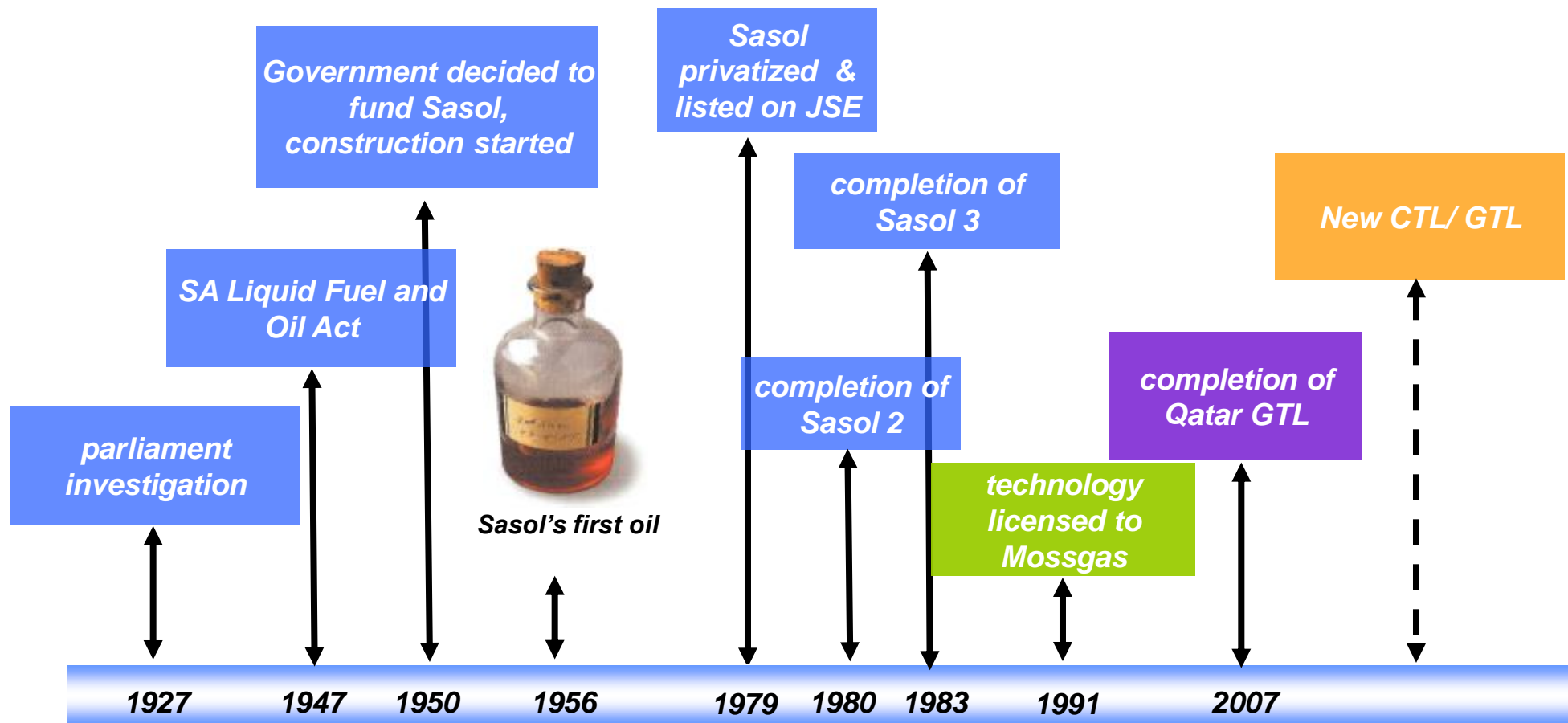
market



fuel



chemicals



commercialisation has progressed over 50 years



Dimensions

160,000 bbl/day CTL

**CTL Plant, Mines, Town and
Associated Infrastructure**

**Approx 12000 employees
including Mining**

Benefits of a CTL

- CTL significantly contributes to GDP
- Balance of payment improvement
- CTL provides SA with a platform to competitively compete in a global economy
- Higher employment rate compared to a crude oil refinery



- South Africa needs to continue intensifying its energy security
- Active role of PPP in investment
- Drivers for CTL are in place and improving
- Positive economic spin-offs for South Africa
- Economic stimulation and job creation
- Cooperation with all stakeholders and partners, including government, is essential to deliver on environmental commitments
 - we know from our environmental roadmap, that the following is critical for future sustainability:
 - energy efficiency initiatives
 - pursuing CO₂ mitigation
 - addressing water constraints (quality and quantity)

thank you

sasol
reaching new frontiers



sasol
reaching new frontiers