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# Nuclear Power for South Africa ASAP?

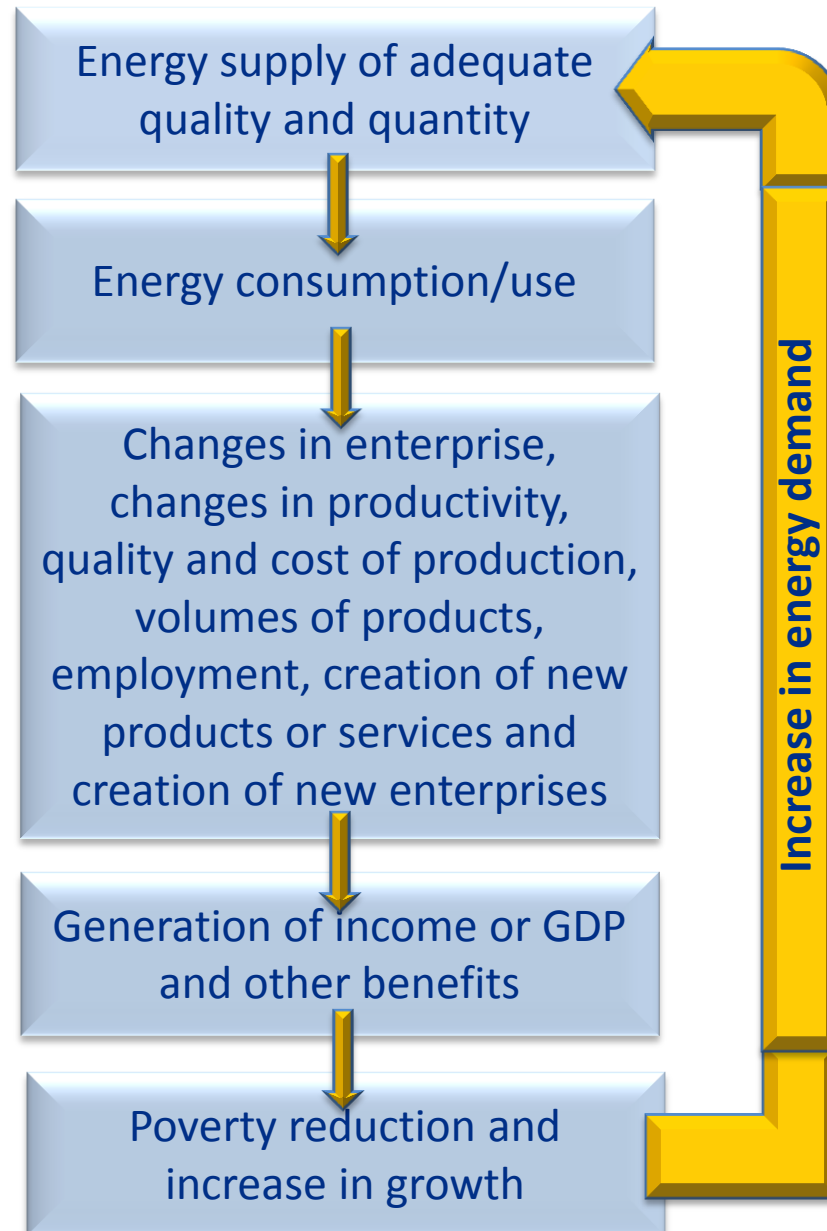
## Yes or No

Prof. Johan Slabber

13 December 2016



# Steps from electricity production to growth in economy and poverty reduction (2)

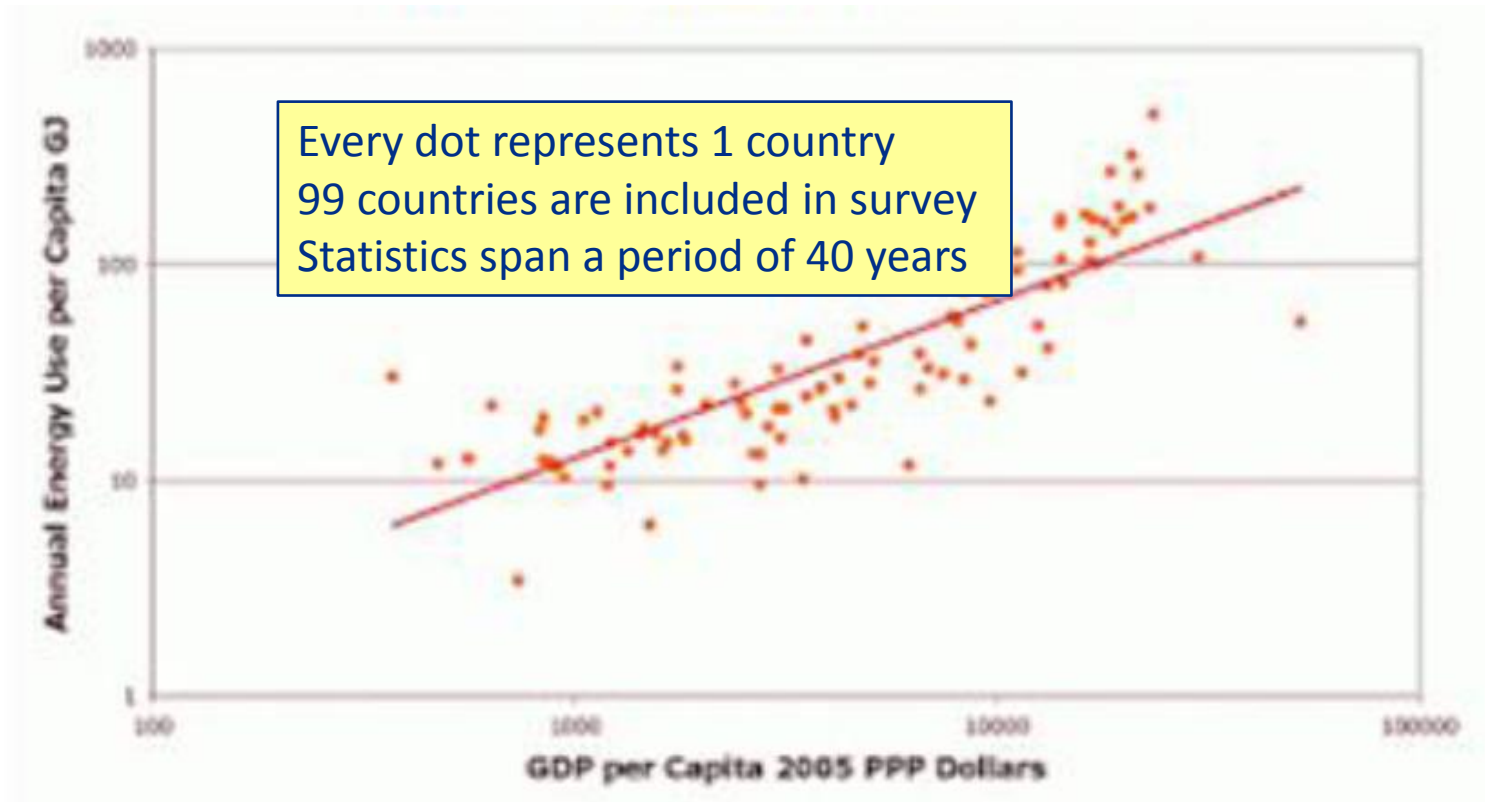


*Adapted from Kooiman-van Dijk (2008)*



# Global energy consumption

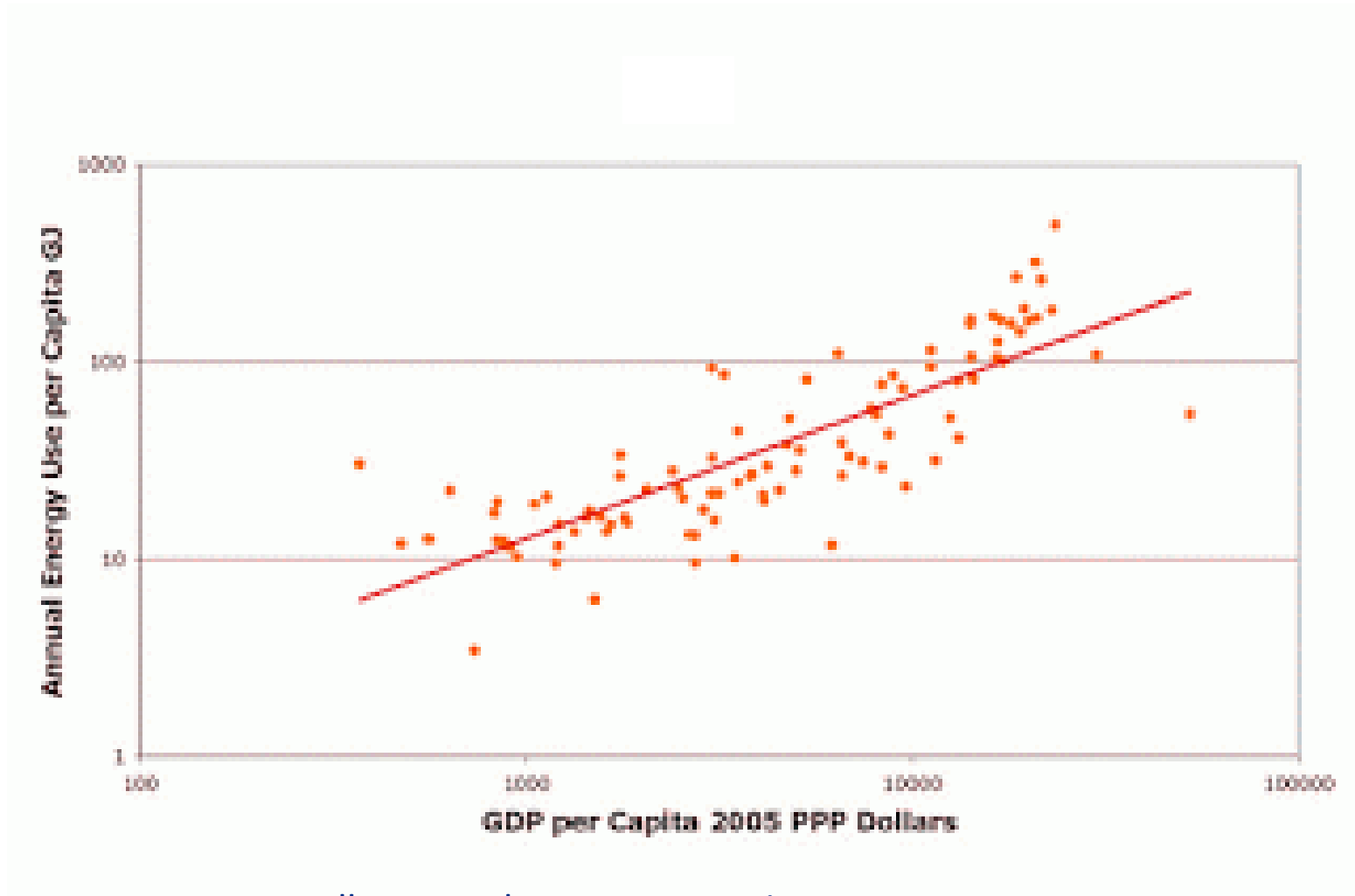
Status of various countries in 1971



PPP Dollars: Purchase Power Parity  
(Typically the “Big Mac” normalization)



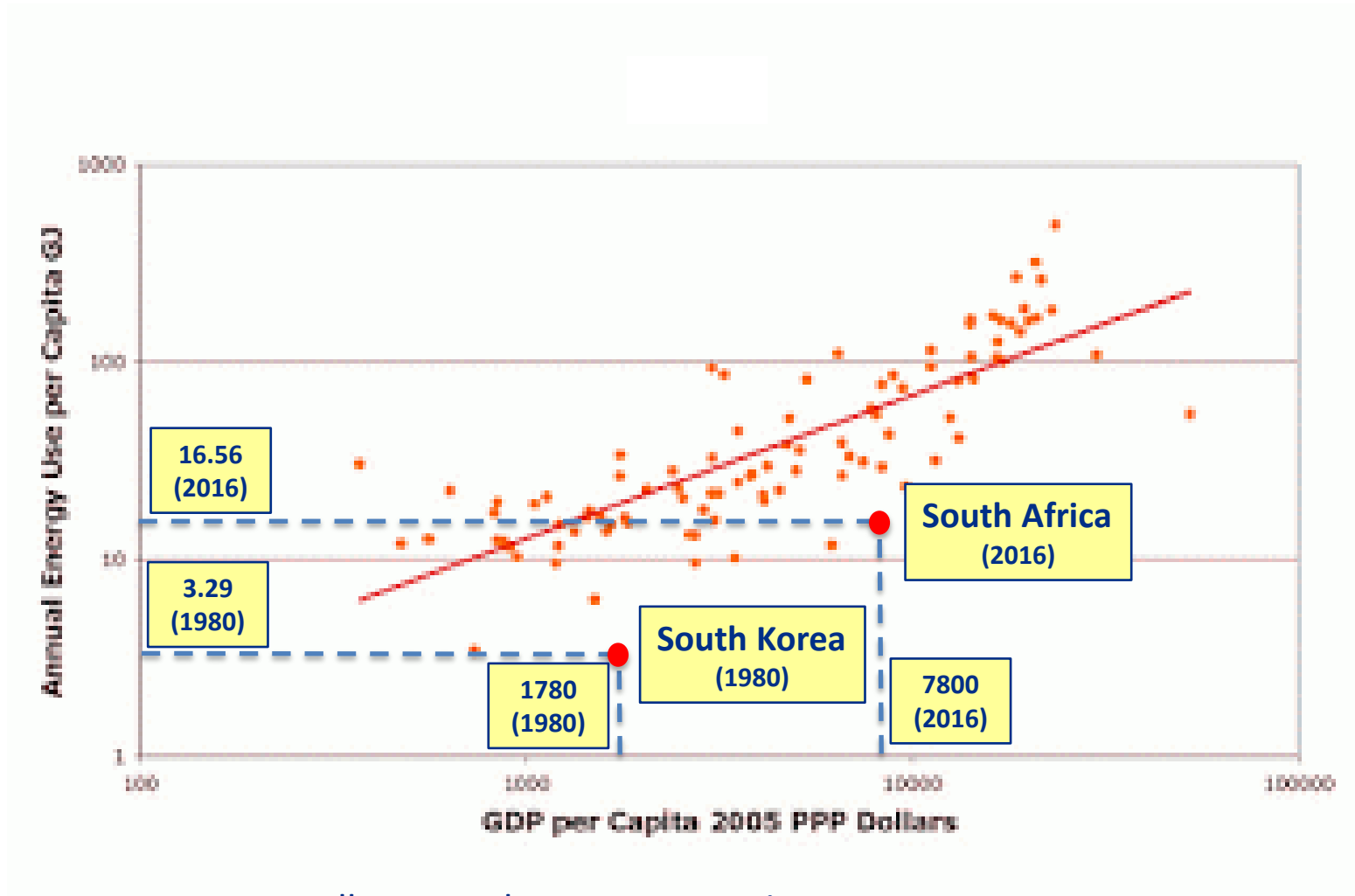
# Global energy consumption



PPP Dollars: Purchase Power Parity



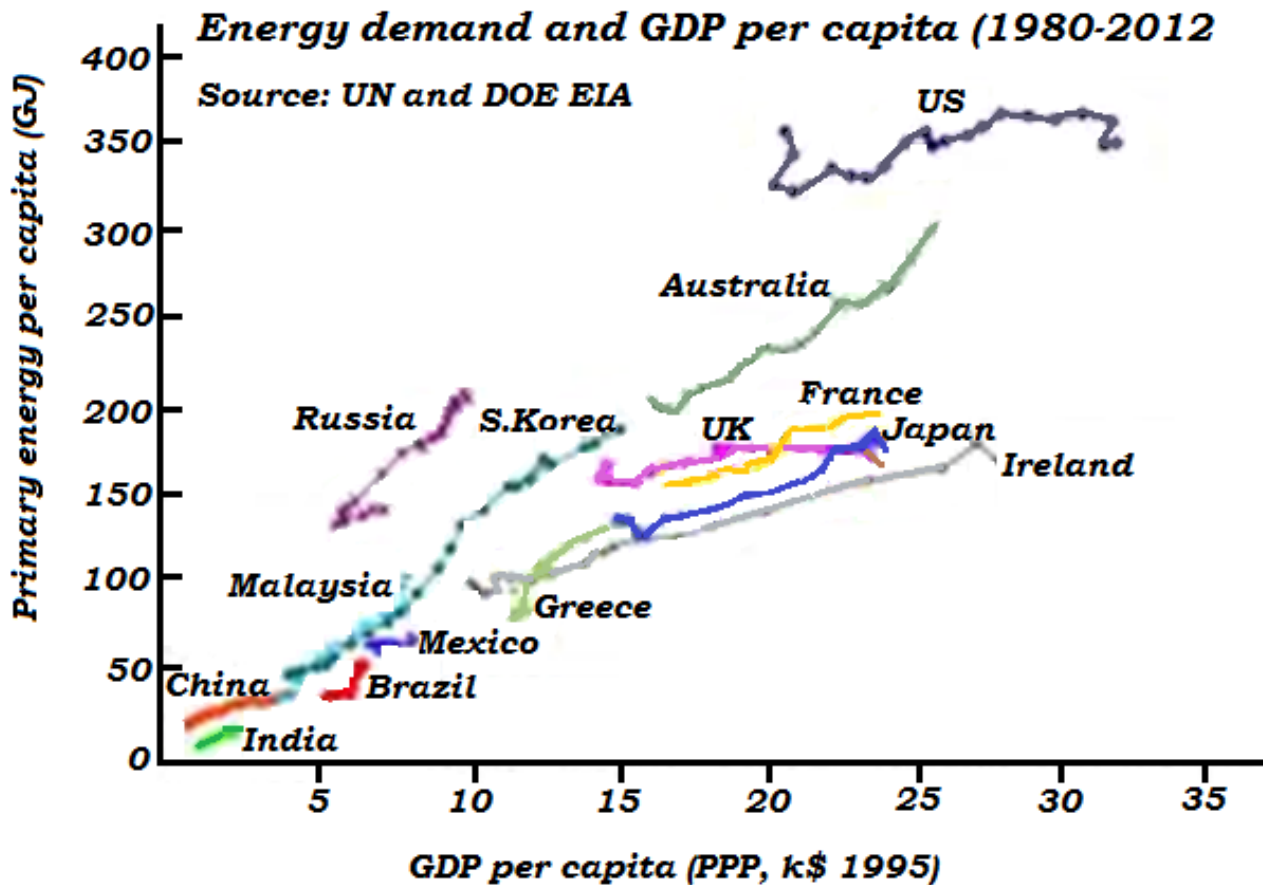
# Global energy consumption



PPP Dollars: Purchase Power Parity



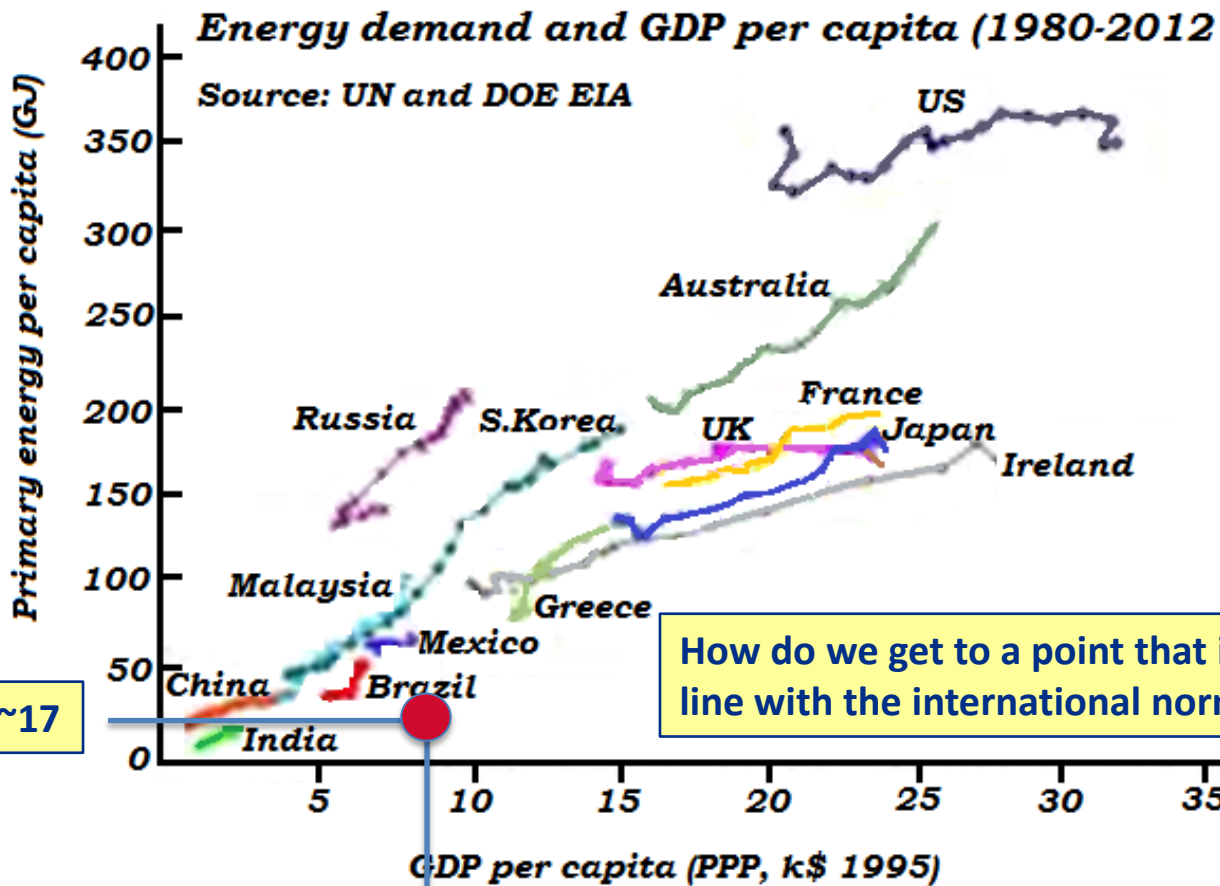
# Global energy consumption per Capita vs GDP per Capita (1)



Where is South Africa now in 2016?



# Global energy consumption per Capita vs GDP per Capita (2)

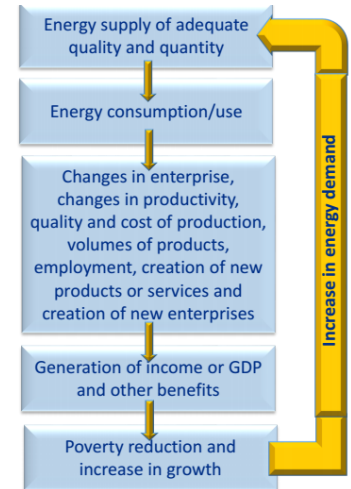
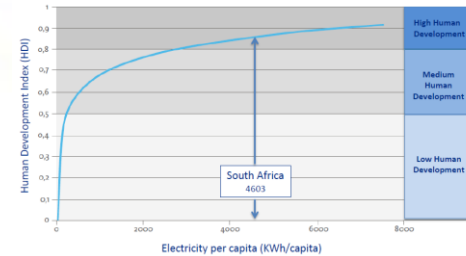
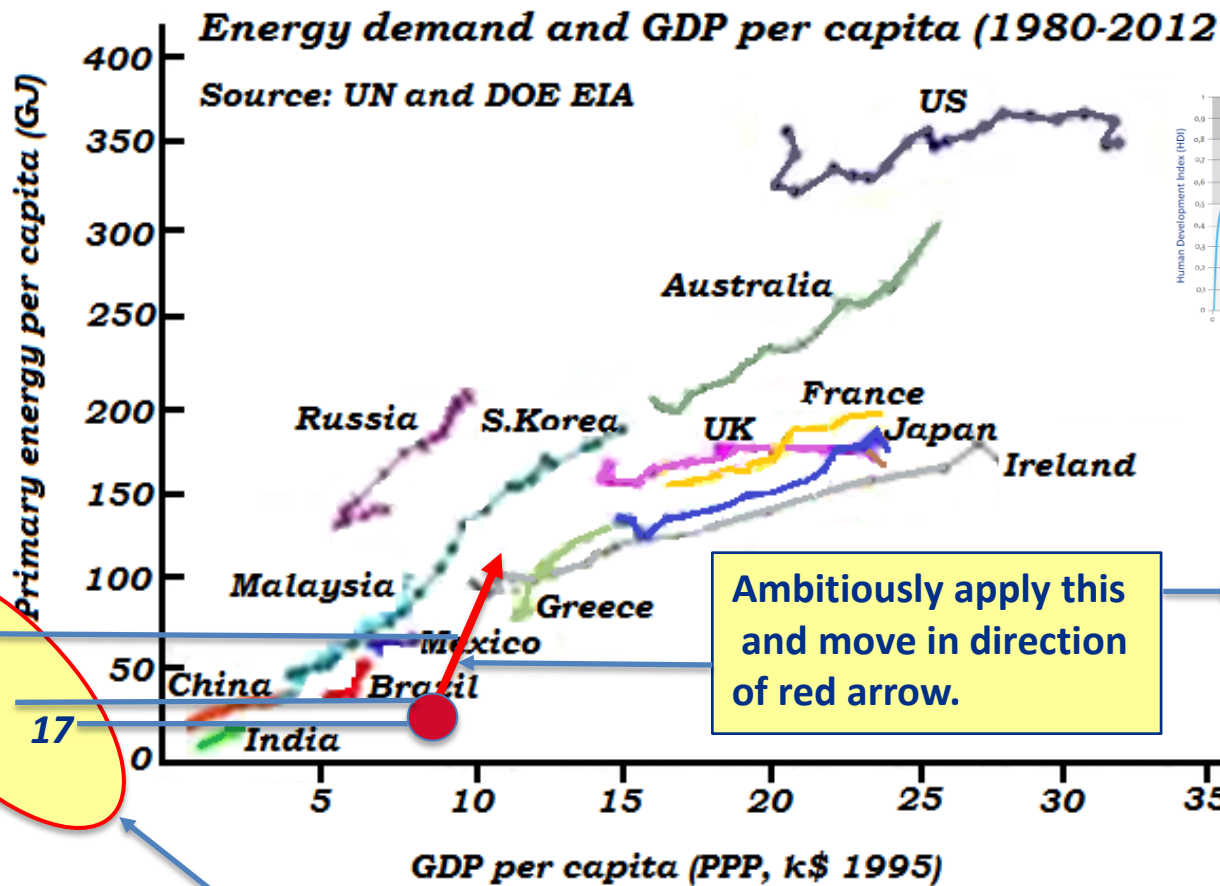


SA Energy ~17

How do we get to a point that is in line with the international norm?

SA GDP ~ 7800

# Global energy consumption per Capita vs GDP per Capita (3)



Ambitiously apply this and move in direction of red arrow.

68  
34  
17

This can ONLY be supplied by large base-load power stations (fossil or nuclear).

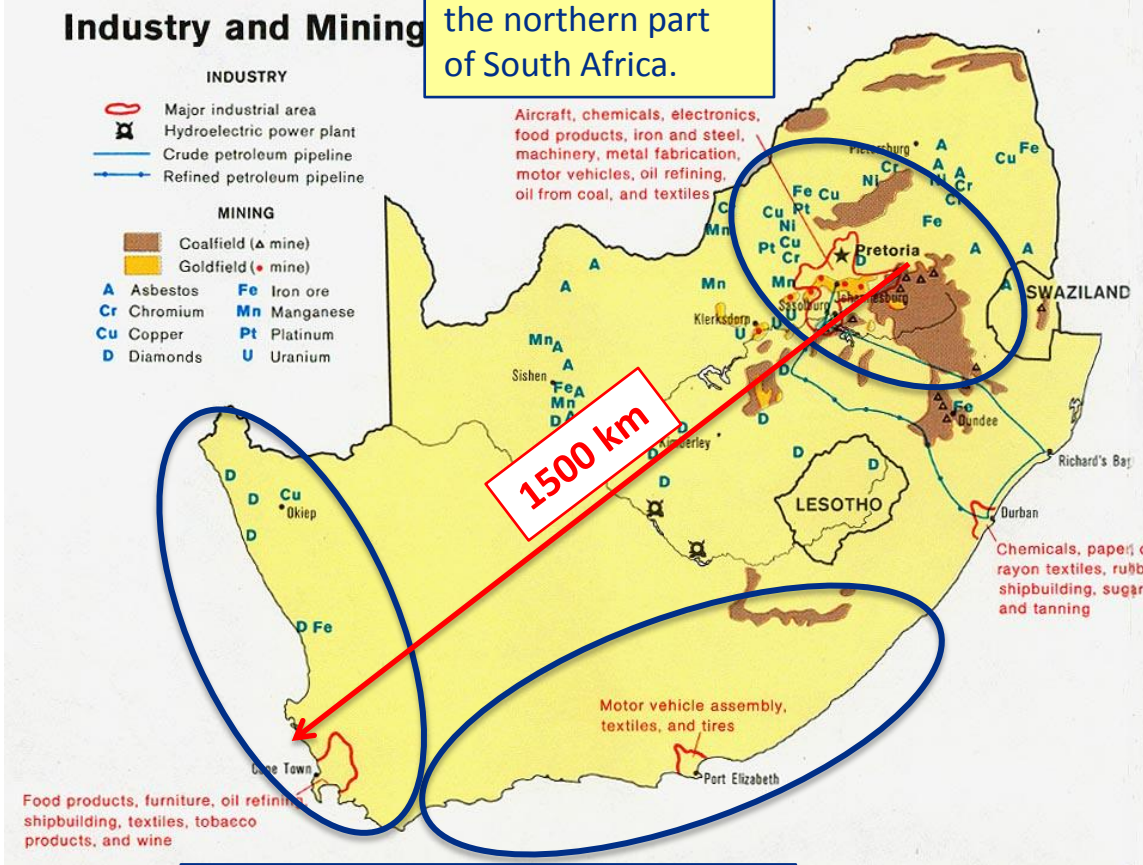
# Can South Africa afford NOT to have nuclear power?

## Industry and Mining

- INDUSTRY**
- Major industrial area
  - Hydroelectric power plant
  - Crude petroleum pipeline
  - Refined petroleum pipeline
- MINING**
- Coalfield (▲ mine)
  - Goldfield (● mine)
  - A** Asbestos
  - Fe** Iron ore
  - Cr** Chromium
  - Mn** Manganese
  - Cu** Copper
  - Pt** Platinum
  - D** Diamonds
  - U** Uranium

Coal fired base-load power stations in the northern part of South Africa.

1500 km



Nuclear power stations for base-load and designed for future addition of desalination installations.

Answer is NO because :

- South Africa is in need of additional reliable base-load electric power;
- Coal fired power stations are not feasible at the coast due to excessive fuel transportation cost;
- Losses are high if power is transmitted over 1500 km. (For 1000 MW at power station only 950 MW will be available at the power take-off point);
- LCOE is comparable with fossil fired power stations;
- Desalination of seawater will utilize the waste heat of reactor and thereby will increase the total efficiency of power generation.

# The last words

**South Africa needs to implement its nuclear power expansion program AS SOON AS POSSIBLE!**

Henry Kissinger once said: “ In decision after decision policymakers have failed to grasp the significance of the problem of conjecture, sometimes underestimating the benefits of pre-emption and sometimes underestimating the **COSTS** of in-action.”

*(My emphasis added)*

Thank you for listening.



Thank you once again