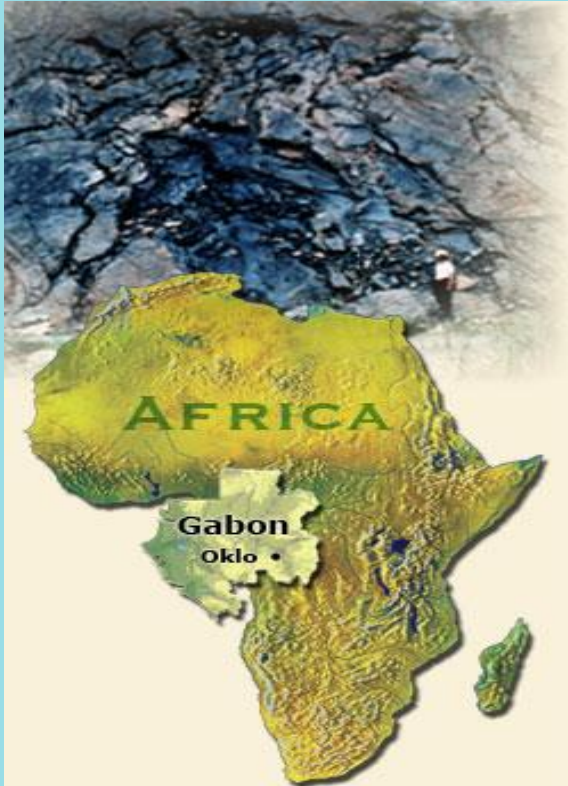


Nuclear Technology: Global trends and Local Possibilities

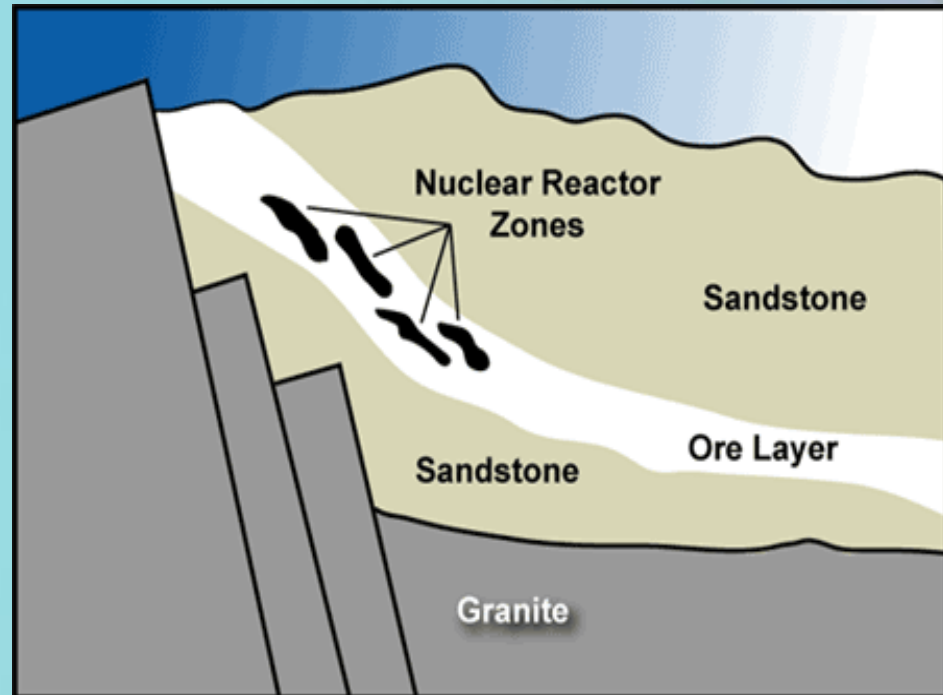
By
Rob Adam
CEO: Necsa

SAIP Conference, 12 July 2011

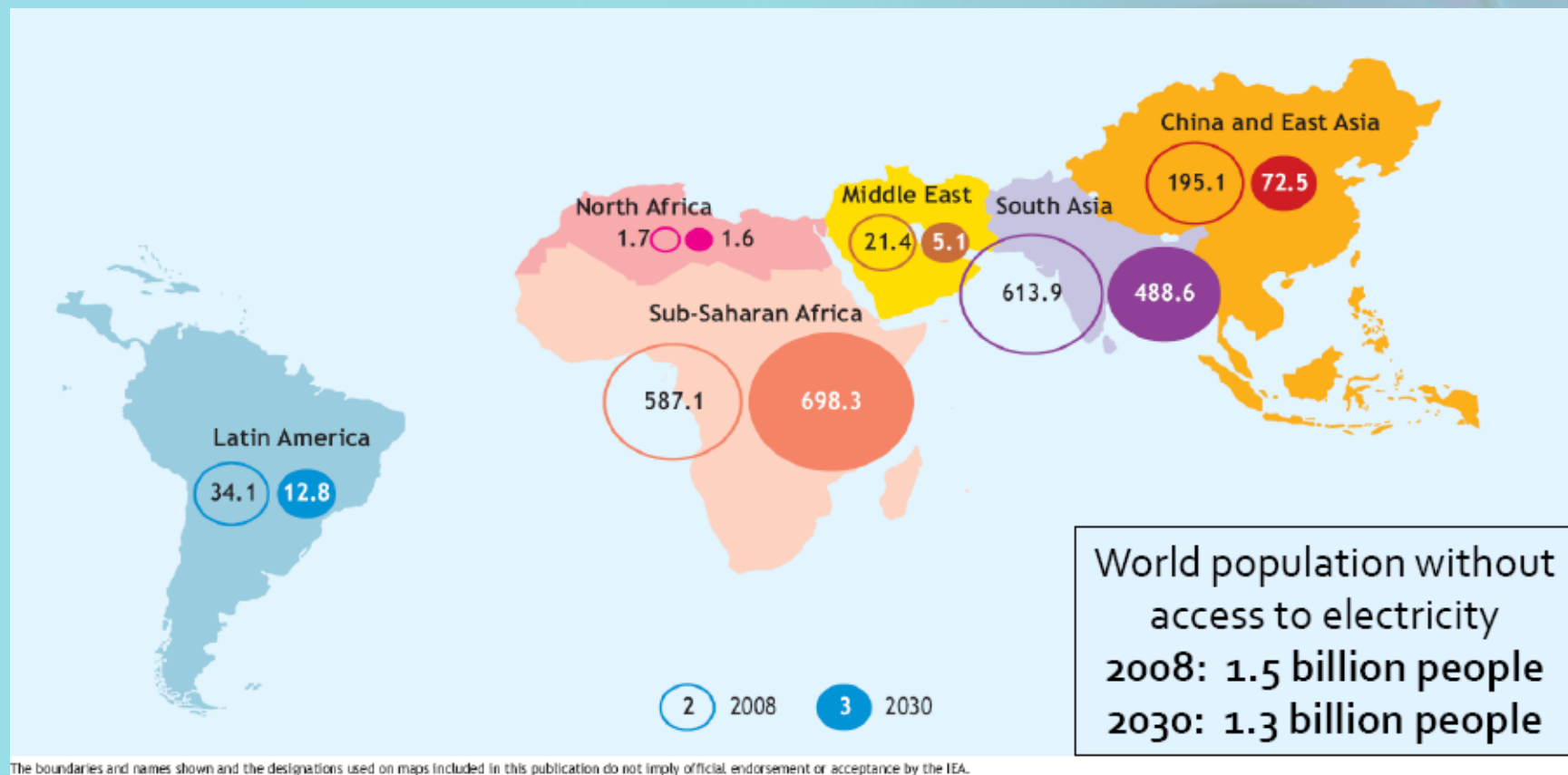
The first nuclear reactor in the world?



The uranium isotopes found at Oklo strongly resemble those in the spent nuclear fuel generated by today's nuclear power plants.

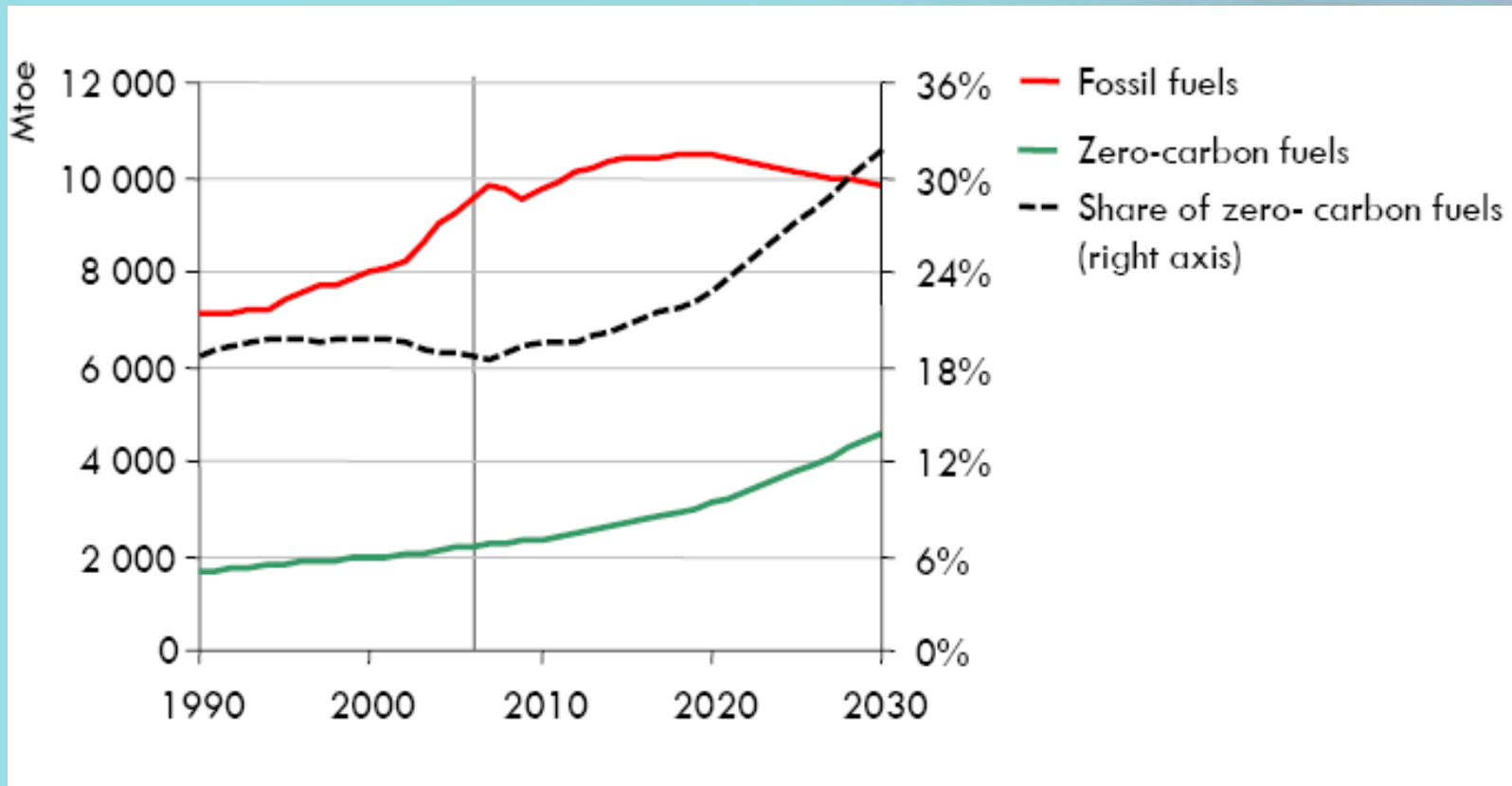


Number of people without access to electricity in Reference Scenario.



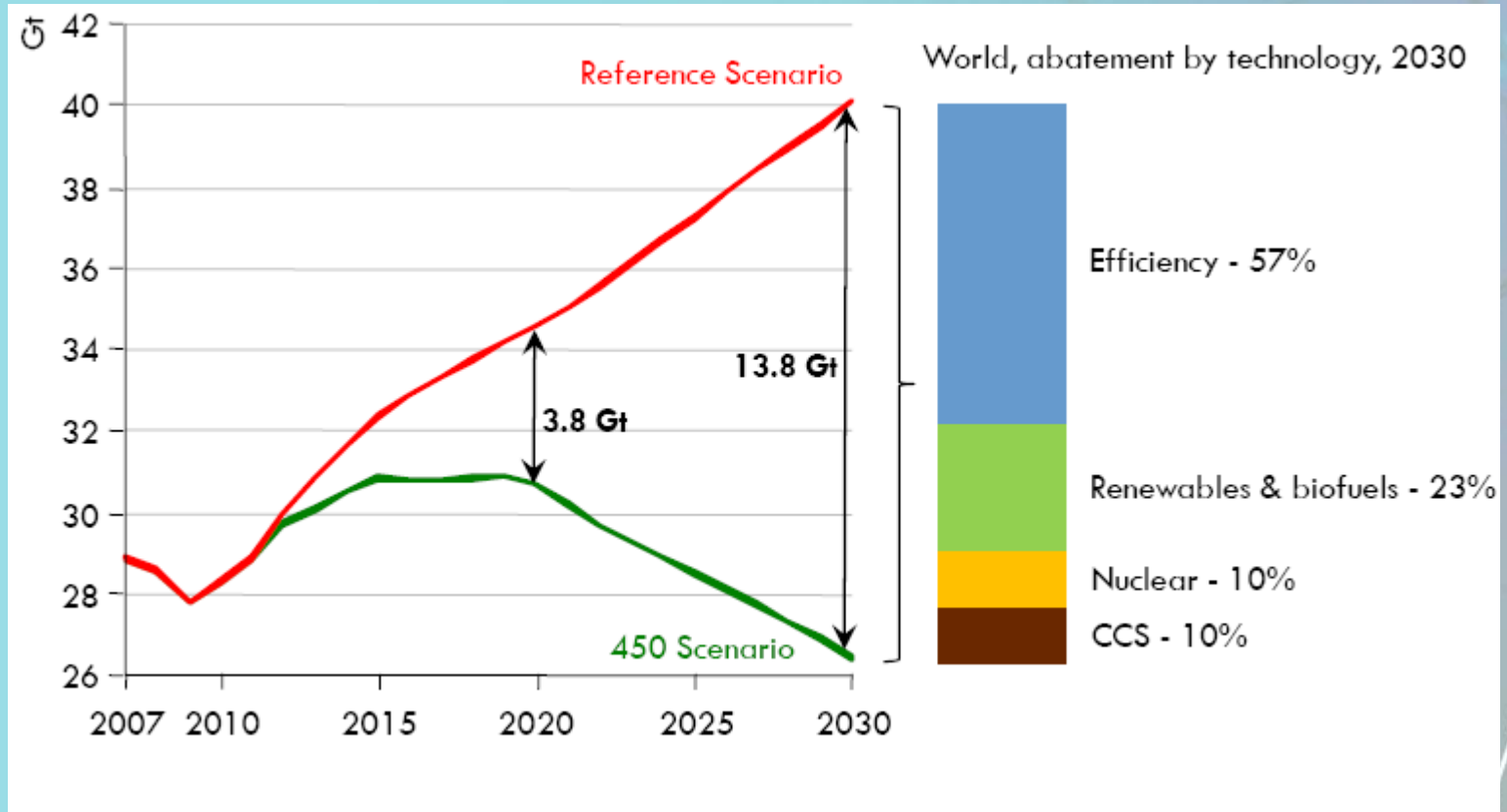
An investment increase of only 5% p.a. would secure universal access by 2030

WEO 450 Scenario (450 ppm CO₂ maximum)



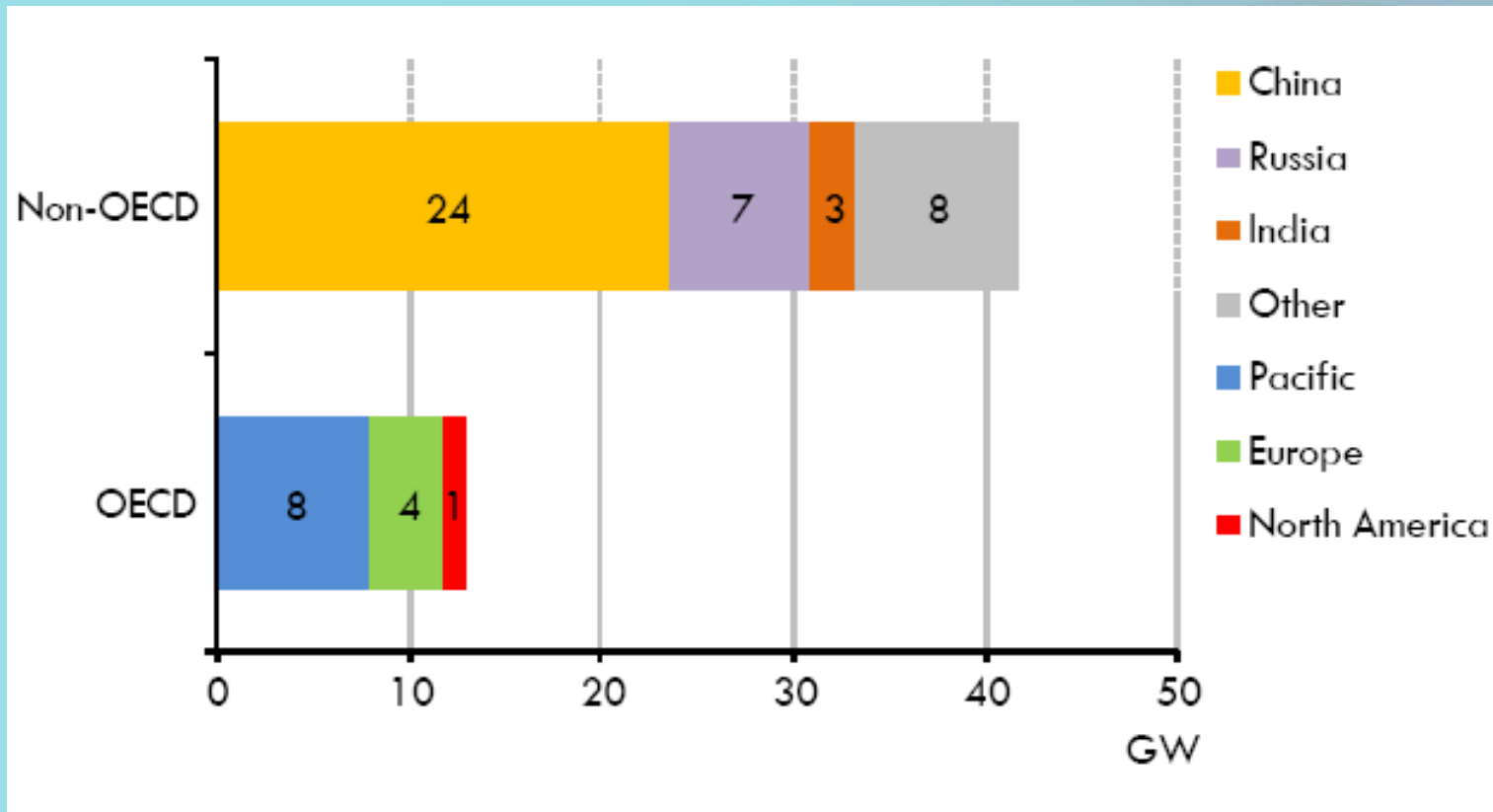
Fossil fuels peak by 2020

World abatement of energy related CO₂ emissions in 450 Scenario



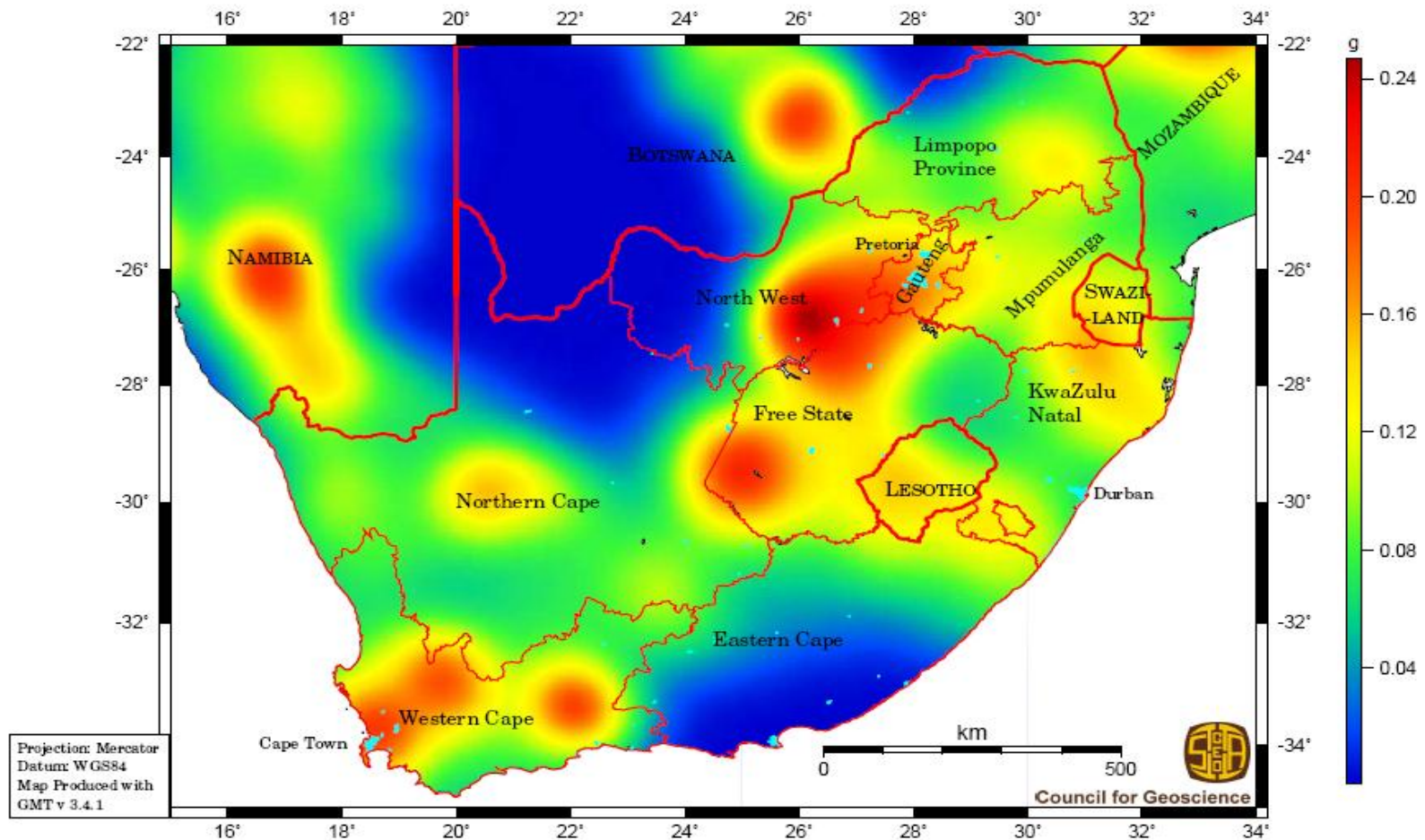
An additional US\$10.5 trillion needed until 2030

Nuclear capacity under construction



75% in non-OECD countries, 40% in China

A seismic map of South Africa



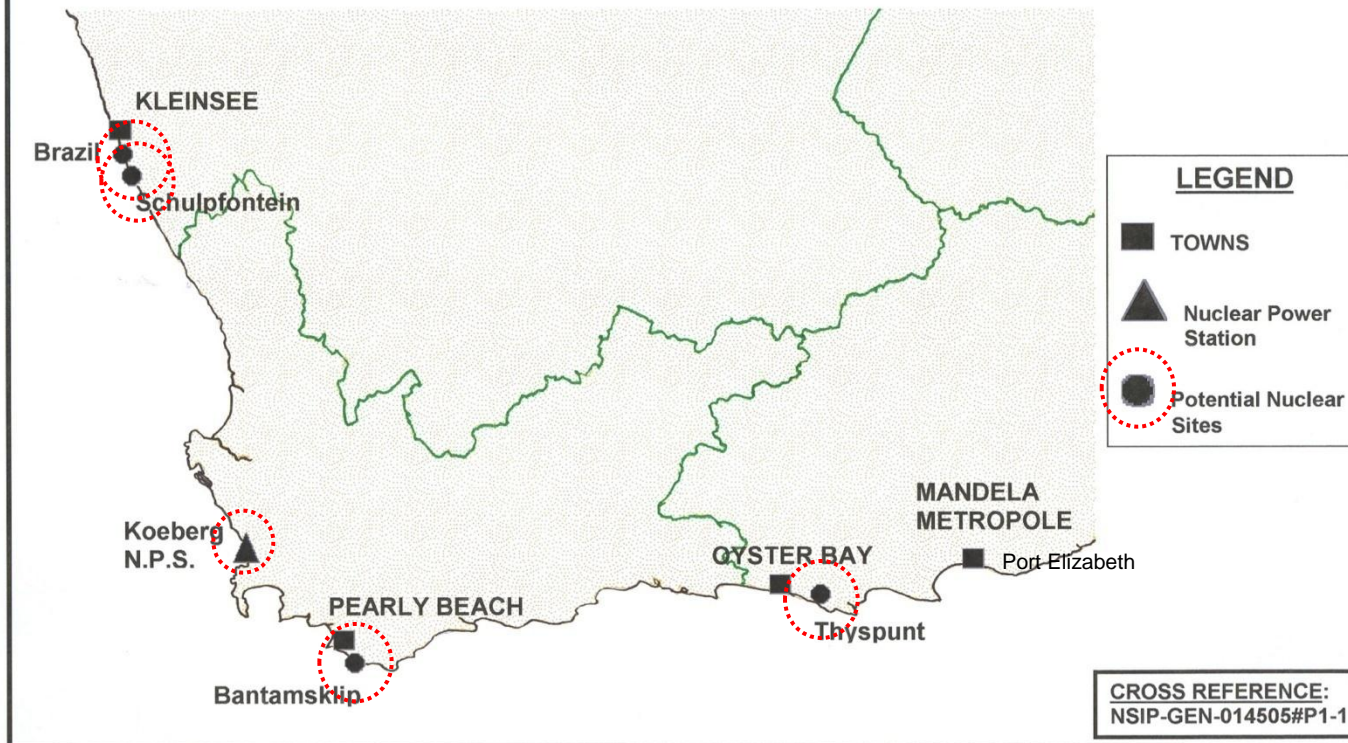
4.1 MAP 1: SEISMIC HAZARD MAP OF SOUTH AFRICA
(INCLUDING THE KINGDOMS OF LESOTHO AND SWAZILAND)

Peak ground acceleration (g) with a 10 % probability of being exceeded in a 50 year period

Potential Nuclear Sites

NSIP-GEN-014510#P1-1

POTENTIAL NUCLEAR COASTAL SITES



Mike
Cep 12

He's grown a foot since I
saw him last.....



Fukushima –the wave arriving



Fukushima - sea water rushing into the plant



Submerged...

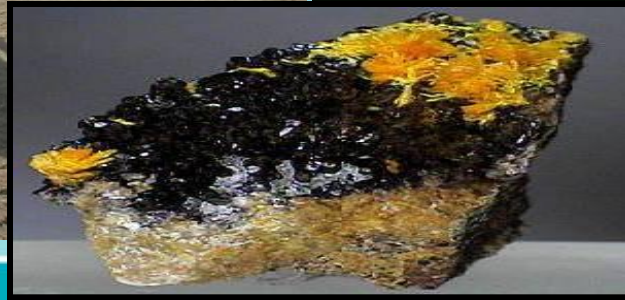


Where & when were these pictures taken?

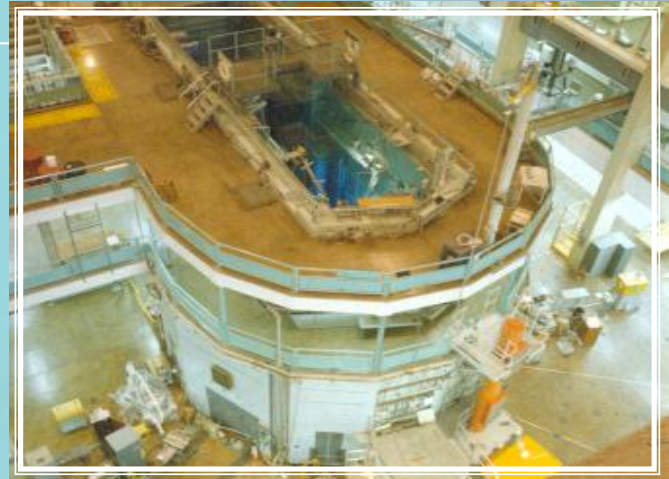


Answer: Chernobyl, 2006

Mining.... 4th largest uranium reserves in the world are in South Africa



SAFARI-1 Research Reactor



Historic Strategic Programme



Uranium Enrichment



Weapons programme

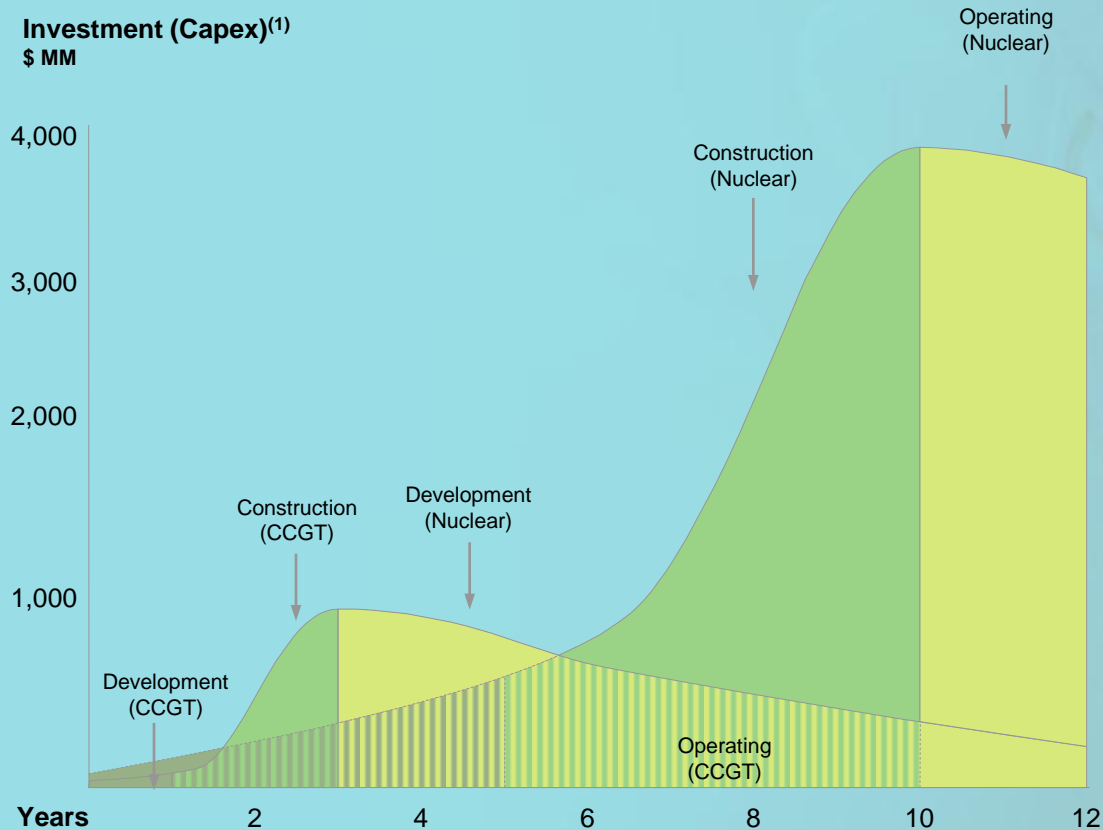


Fuel Fabrication

Two PWR Reactors at Koeberg (1800 MW)



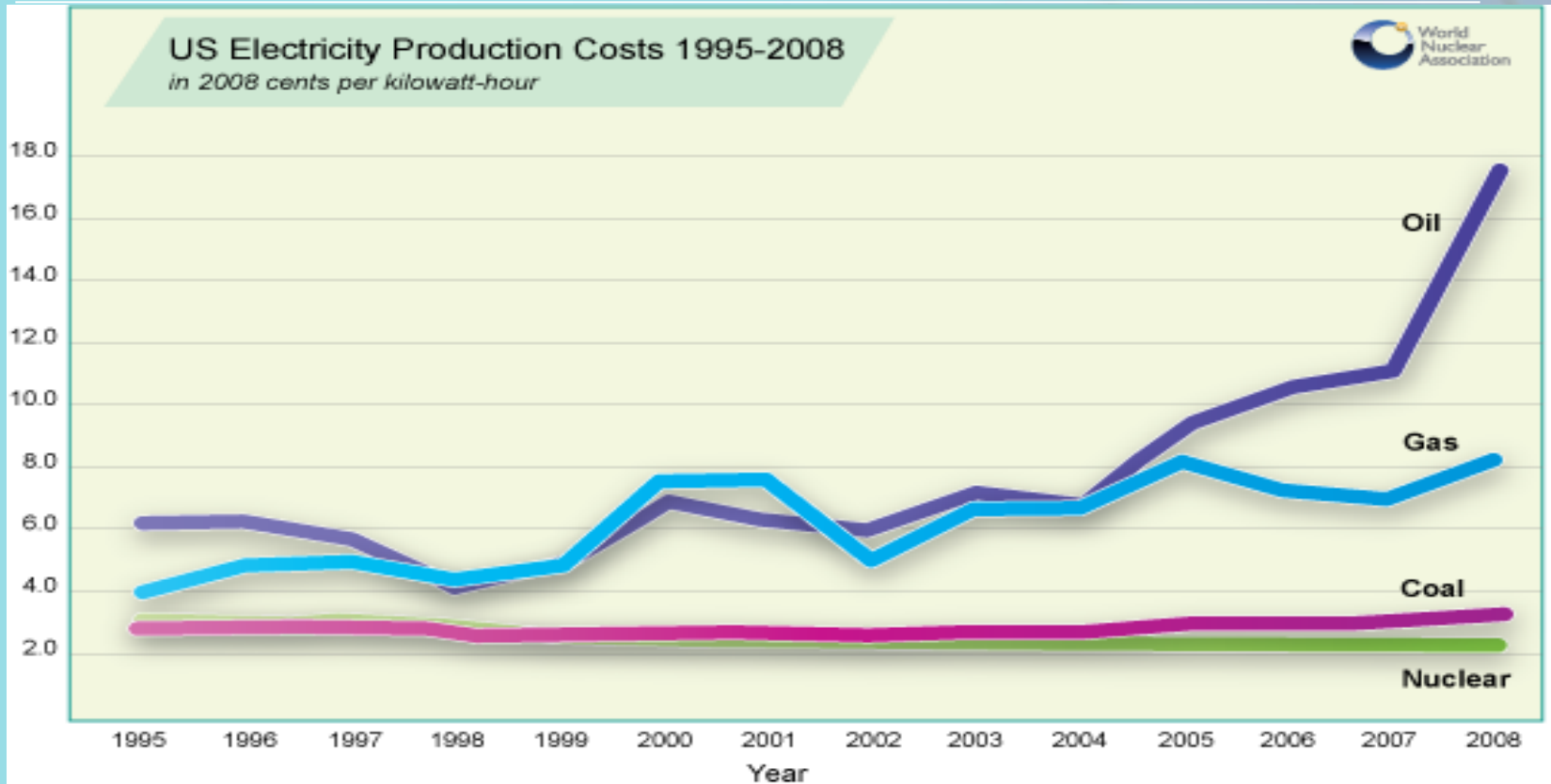
Financing Concerns



Assuming 1,000 MW plant

Recent Industry Developments

US Electricity Production Costs



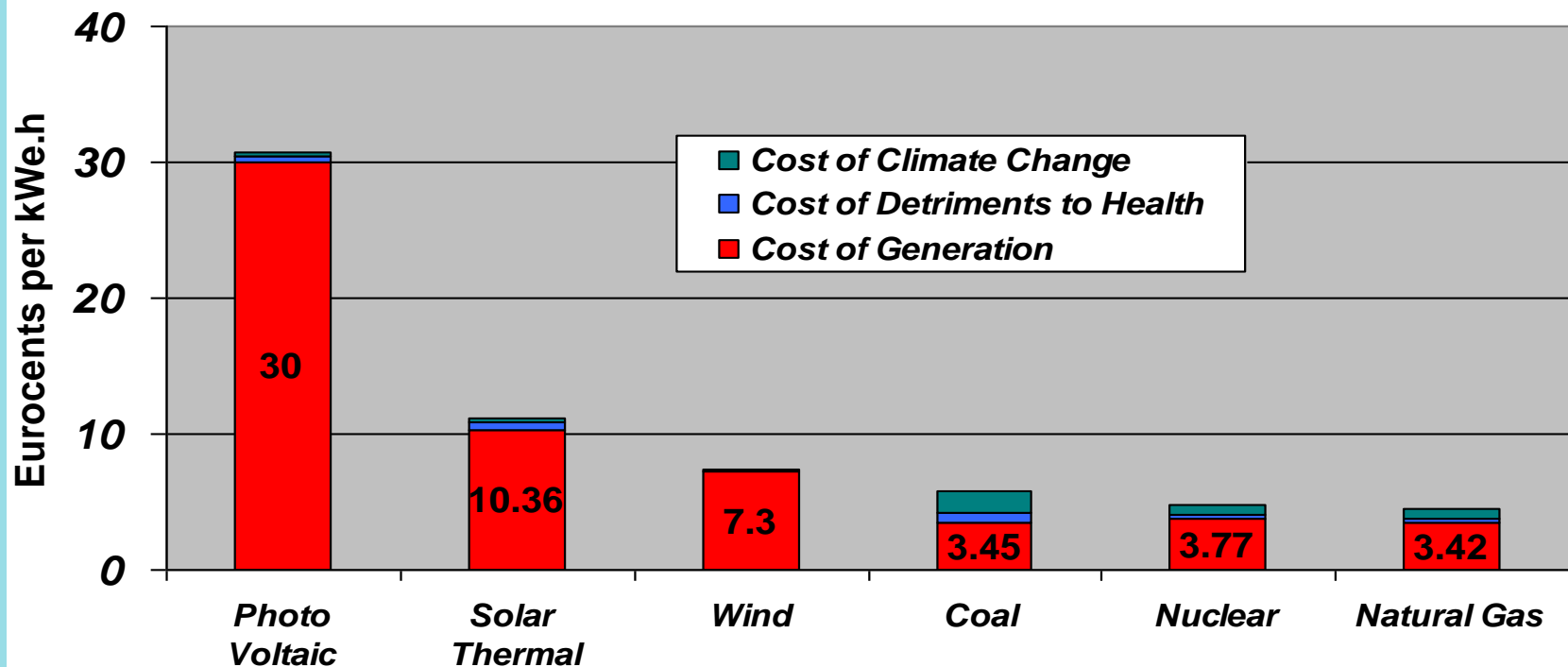
Production Costs = Operations & Maintenance + Fuel. Production costs do not include indirect costs or capital.

Source: Ventyx Velocity Suite, via NEI

Recent Industry Developments

Cost of producing electricity from new power stations

(European Union estimate, 2008)



But the fundamentals remain unchanged...

Diversification from reliance on coal must lead to more nuclear because of absence of other baseload options. If we don't diversify, our carbon strategy will be to plead for special treatment as a developing world nation to avoid penalties.

Geographic factors in Western Cape & Eastern Cape rule out local coal or hydro, and gas prices are very volatile. Transporting millions of tons of coal to these regions is impractical and prohibitively expensive.

But the fundamentals remain unchanged...

Costing over the 60 year life time of power stations, in a world that is rejecting unsequestered carbon, introduces large cost uncertainties into fossil fuel generation.

Long term price trajectories means nuclear fuel cycle investment is attractive and may be needed to underpin security of supply.