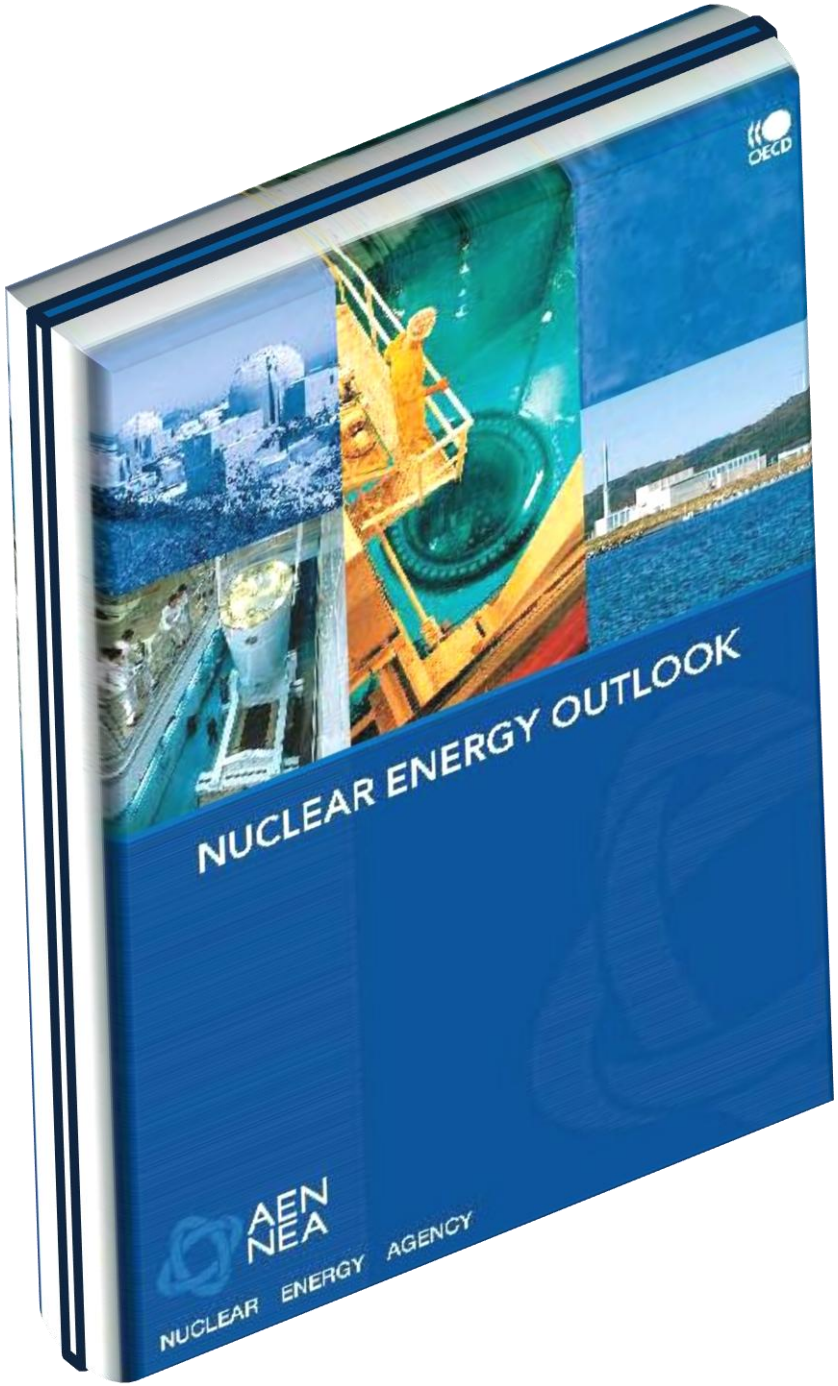


Nuclear Energy Outlook

Janice DUNN LEE
Deputy Director-General
OECD Nuclear Energy Agency

COP 14
Poznan, Poland
3-4 December 2008

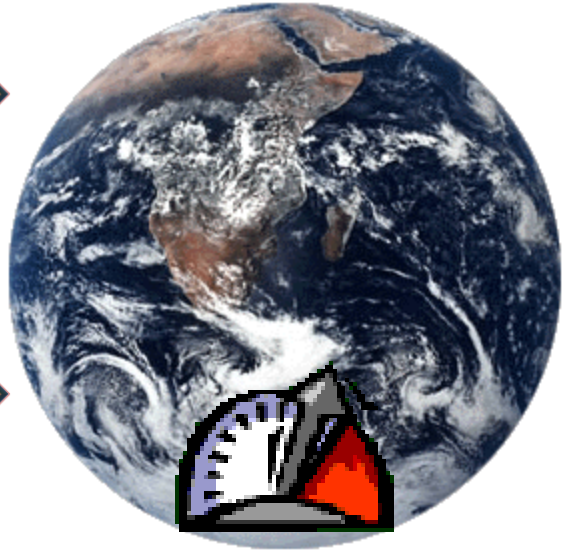
A lasting tribute to the NEA's 50 years

- First-ever NEA outlook
- Responding to renewed interest in nuclear energy
- Intention to inform the debate

Why the renewed interest in nuclear energy?

Growth in energy demand

Fossil fuel prices

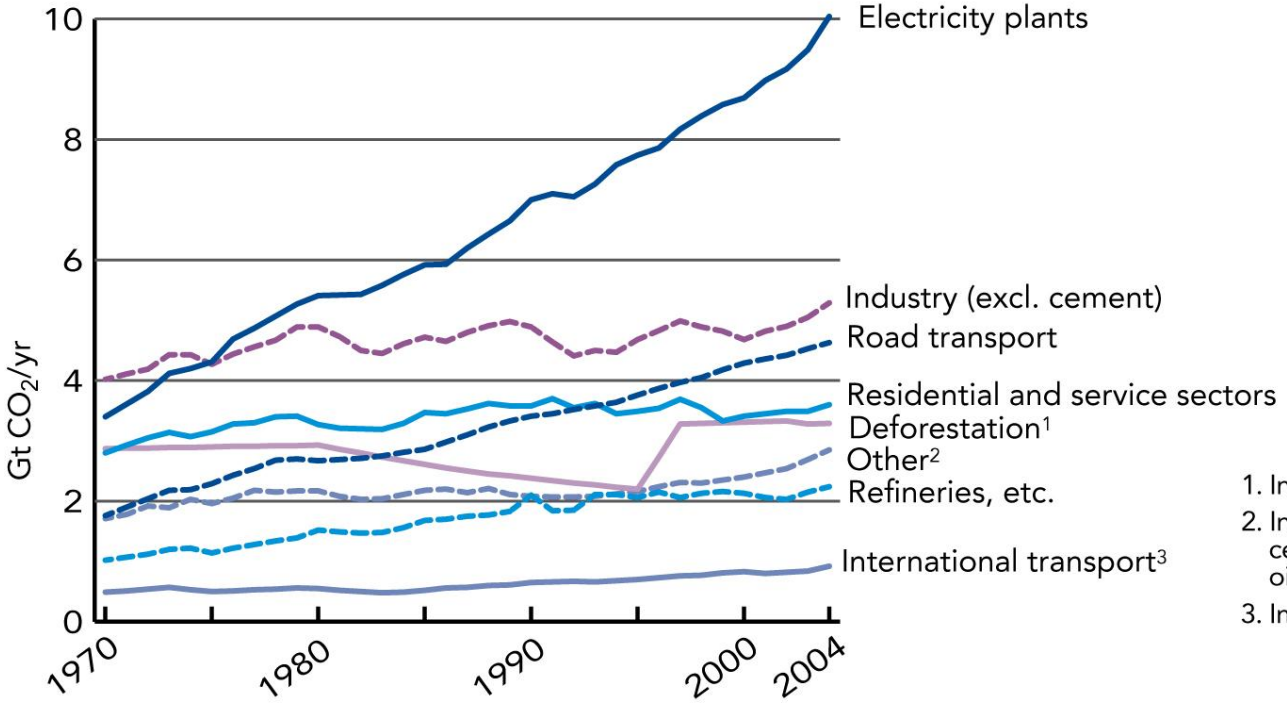


CO_2 emissions + climate change

Security of energy supply

Why the renewed interest in nuclear energy?

Figure 4.6: Sources of global anthropogenic CO_2 emissions



1. Includes fuel wood and peat fires.
2. Includes other domestic surface transport, cement making, venting/flaring gas from oil production, non-energetic use of fuel.
3. Includes aviation and marine transport.

Source: IPCC (2007b).

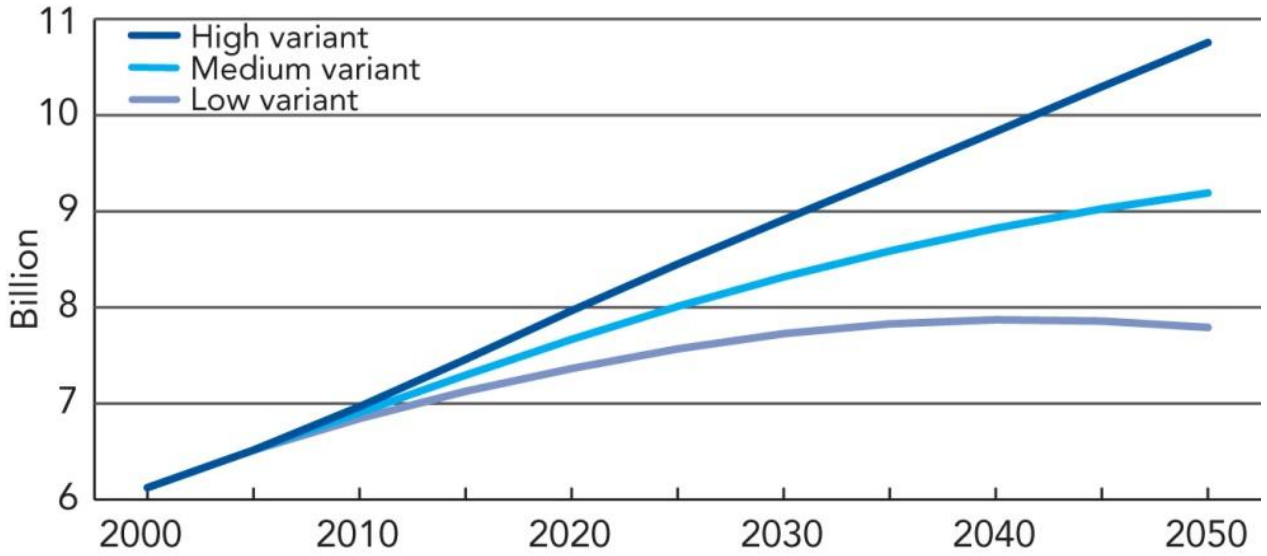
Why the renewed interest in nuclear energy?

Carbon-dioxide emissions from fossil-fired power plants by far the biggest and fastest-growing sources of CO_2

Business as usual to 2050

Population up by 50%...

Figure 3.1: UN projections of world population

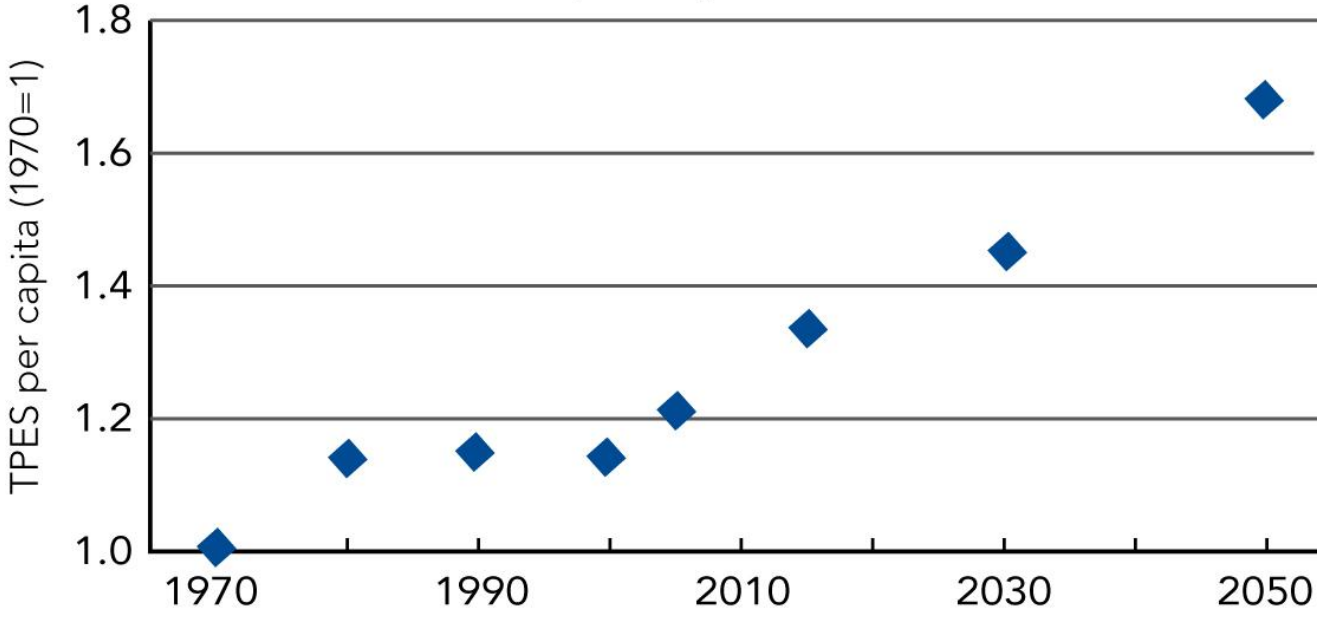


Source: UNPD (2006).

Business as usual to 2050

Energy demand up by 100%…

Figure 3.2: Increase in total primary energy supply (TPES) per capita

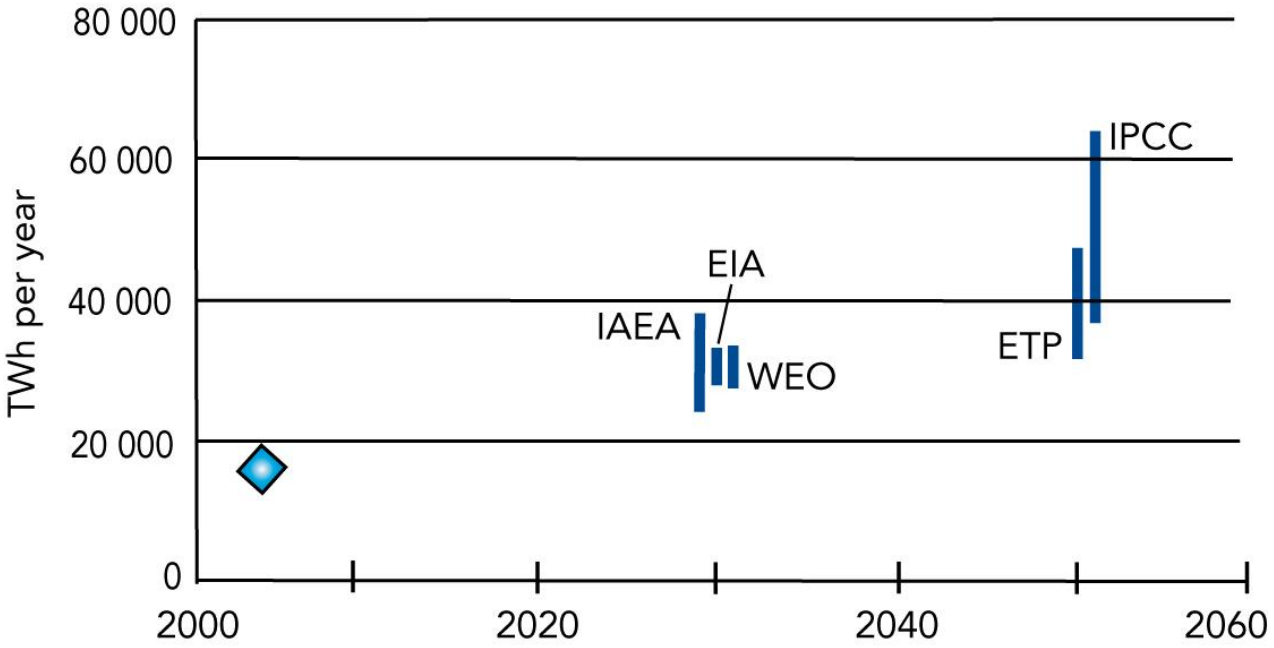


Sources: adapted from IEA data (2006a, 2006b).

Business as usual to 2050

Electricity demand up by 150%…

Figure 3.5: Projected increase in electricity demand worldwide



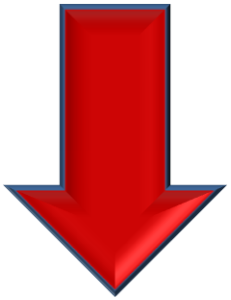
Note: The vertical bars at 2030 and 2050 have been separated for ease of reading.

Business as usual 2050

Population up by 50%...

Energy demand up by 100%...

Electricity demand up by 150%...

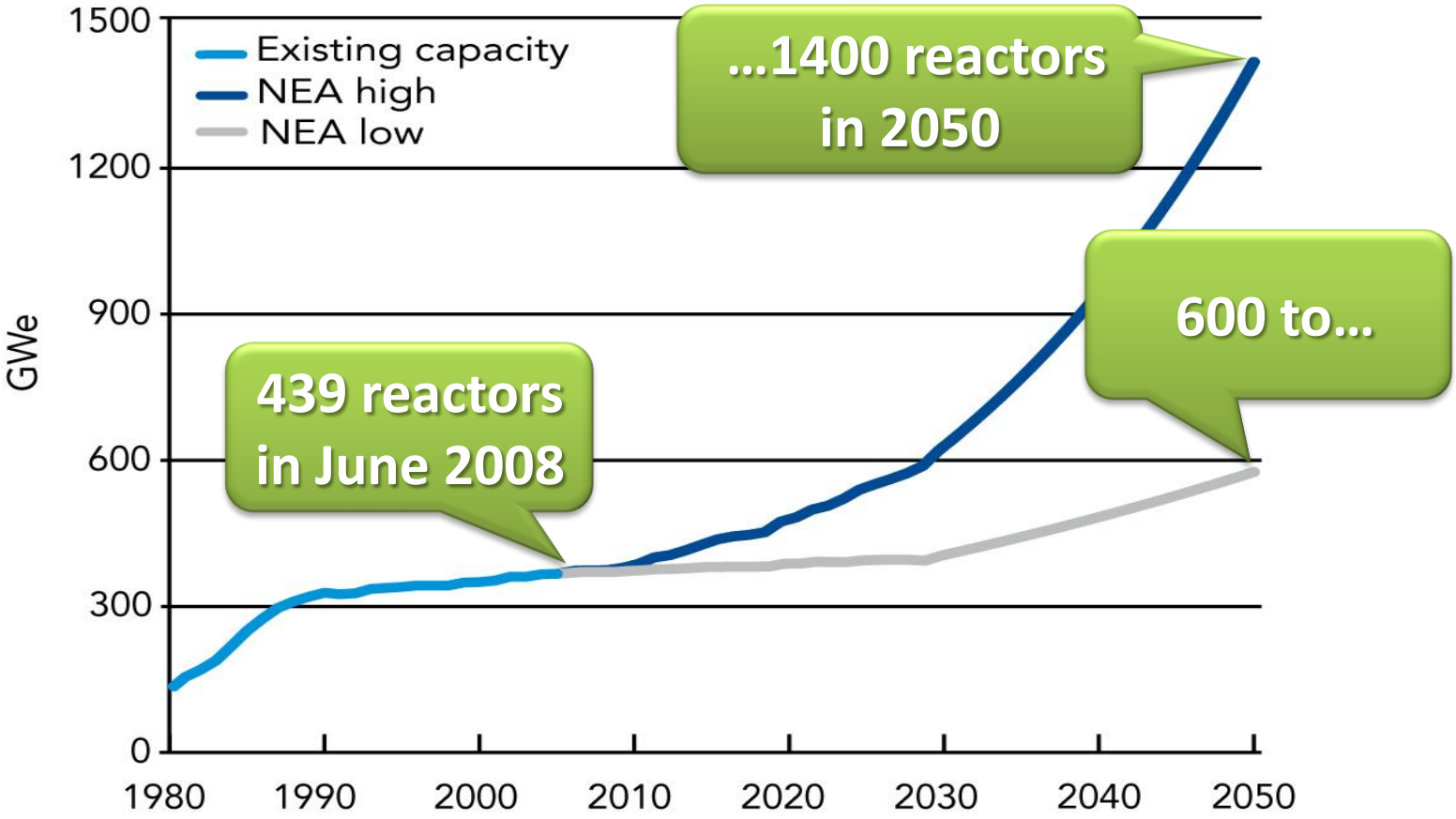


CO_2 emissions per unit of energy consumption must be reduced by a factor of 4

Nuclear power could make a significant contribution

Nuclear energy's potential role

Figure 3.11: Global nuclear capacity in the NEA high and low scenarios

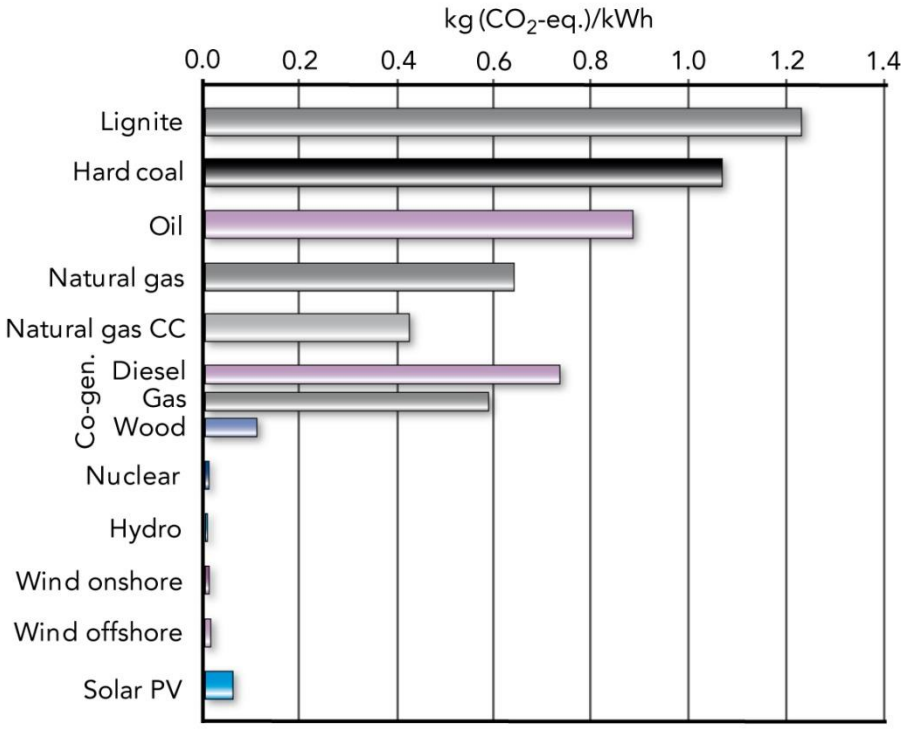


Nuclear power could expand by a factor of nearly 4

Potential benefits of nuclear power

Virtually CO_2-free

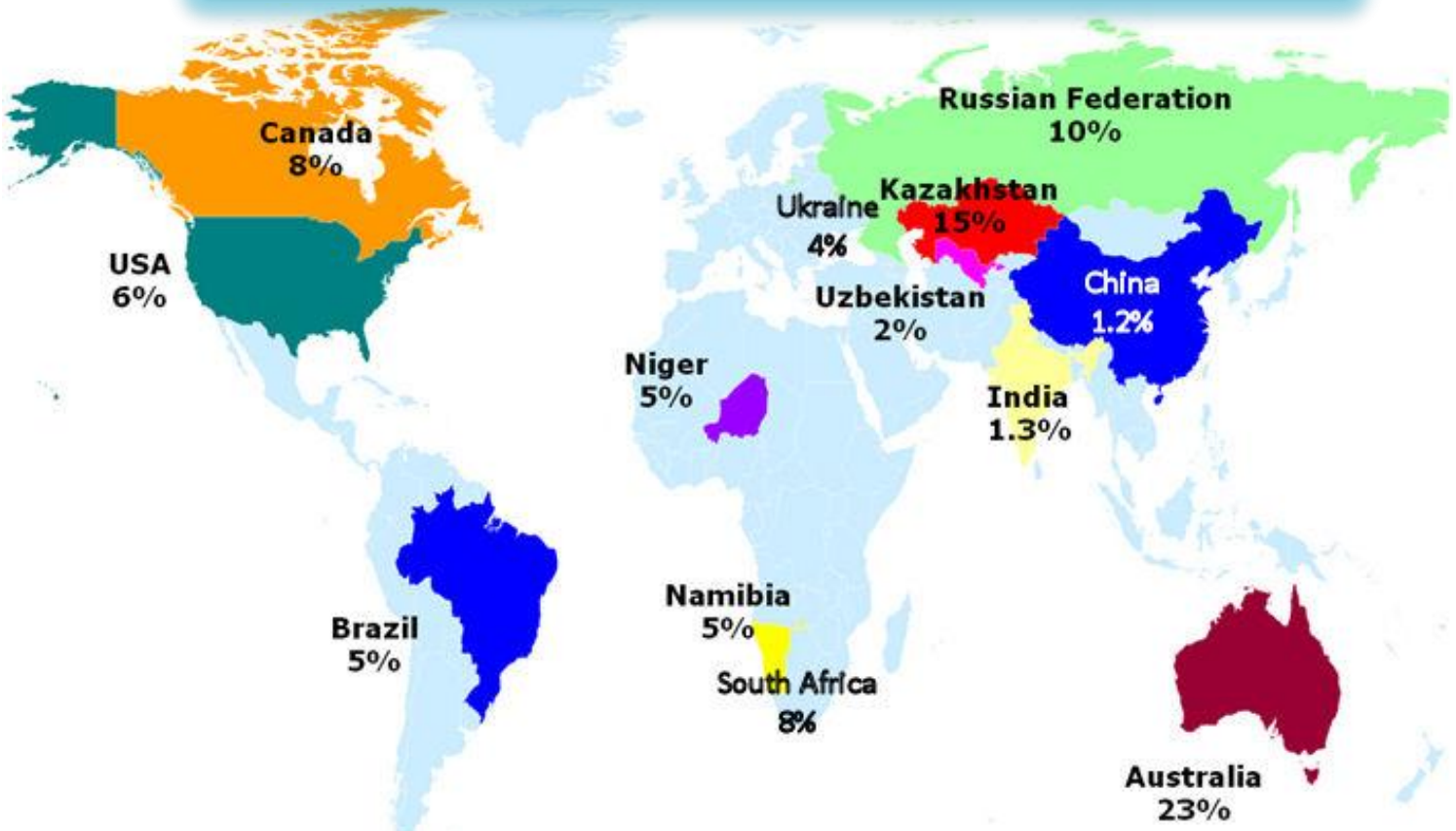
Figure 4.7: Greenhouse gas emissions of selected energy chains



Average UCTE emissions. Source: based on Dones *et al.* (2004).

Potential benefits of nuclear power

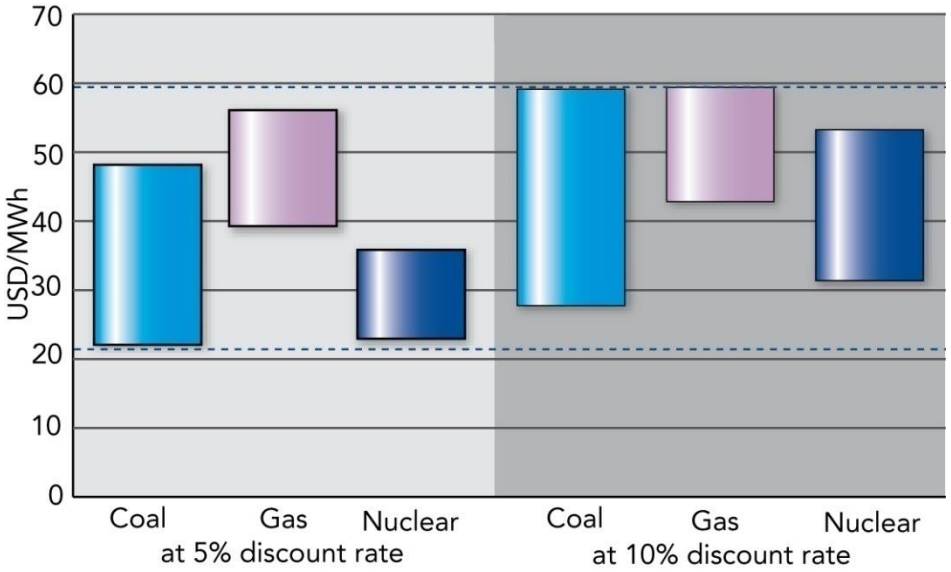
Diverse, politically stable sources of plentiful uranium



Potential benefits of nuclear power

Cost competitive and very insensitive to price of uranium

Figure 6.8: Range of levelised costs for nuclear, coal and gas power plants at 5% and 10% discount rates
(USD/MWh)

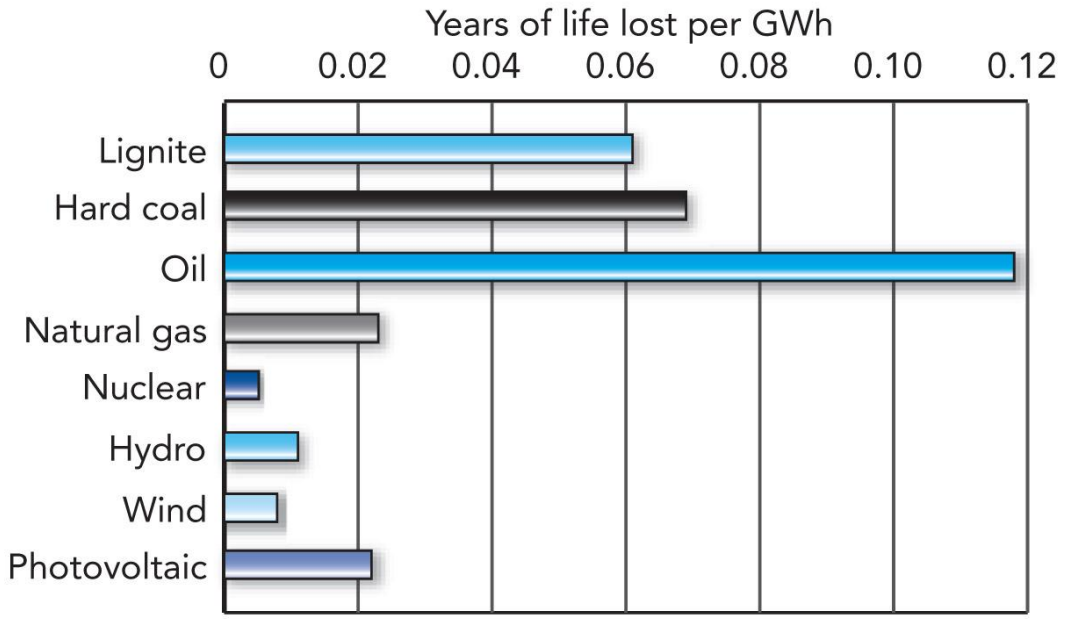


Note: the 5% lowest and highest values of levelised generation costs have been excluded from the ranges shown on the figure.

Potential benefits of nuclear power

Avoids significant health effects

Figure 4.16: Mortality resulting from the emissions of major pollutants from German energy chains during normal operation in 2000



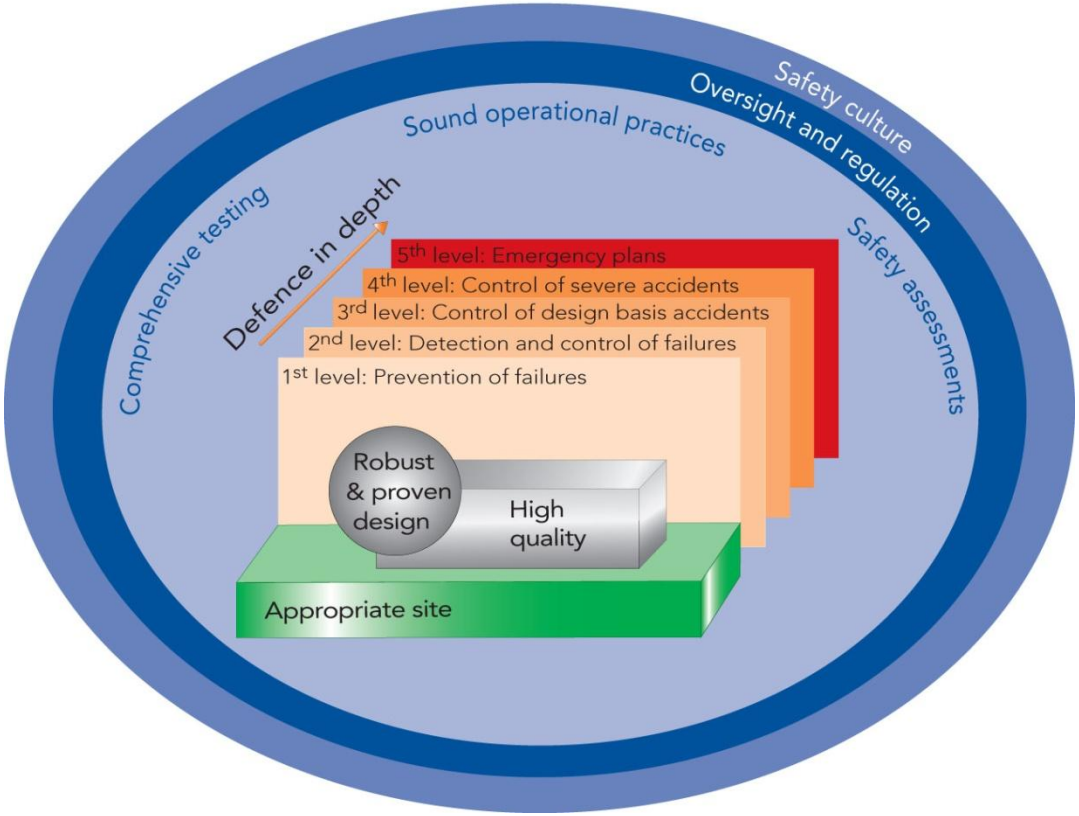
Source: based on Hirschberg *et al.* (2004).

Managing current and future challenges

Unsafe?

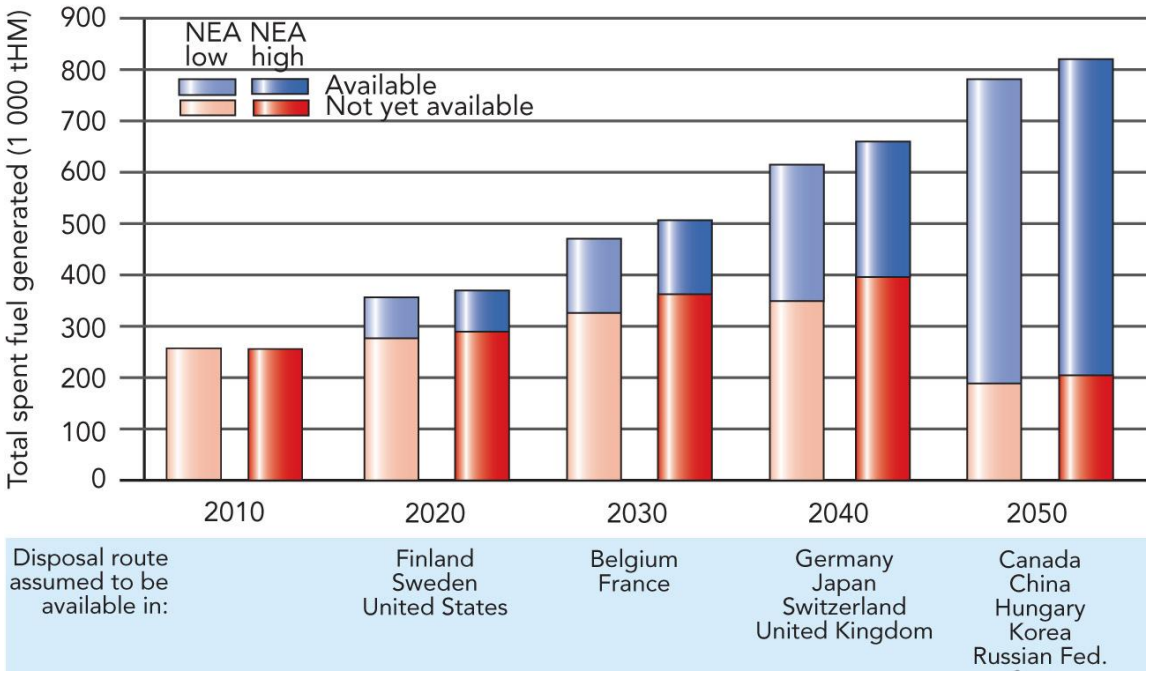
Actually, safer than baseload alternatives

Figure 7.1: Elements of nuclear safety



Managing current and future challenges

Figure 8.5: Availability of disposal routes for HLW or SNF from nuclear electricity generation



Radwaste?

Actually, most disposable by 2050

Managing current and future challenges

Proliferation?
NPT largely successful,
improved regime under discussion

1400 reactors in 2050?

Today's reactors are fit for purpose and could provide for a significant expansion to 2050

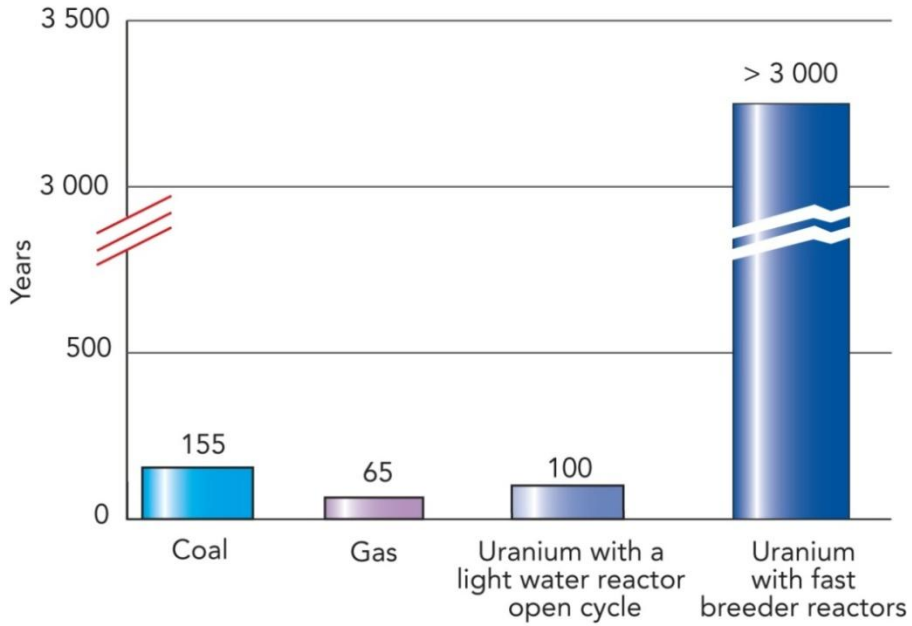
Significant CO_2 alleviation now

Tomorrow's fast reactors can expand the energy available from uranium by up to 60 times

Vast resources of virtually CO_2-free energy

1400 reactors in 2050?

Figure 6.11: Lifetime of energy resources
(years of present annual consumption rates*)



* Uranium resource lifetimes have been calculated using estimated consumption at present nuclear electricity generation rate.

Vast resources of virtually CO_2-free energy

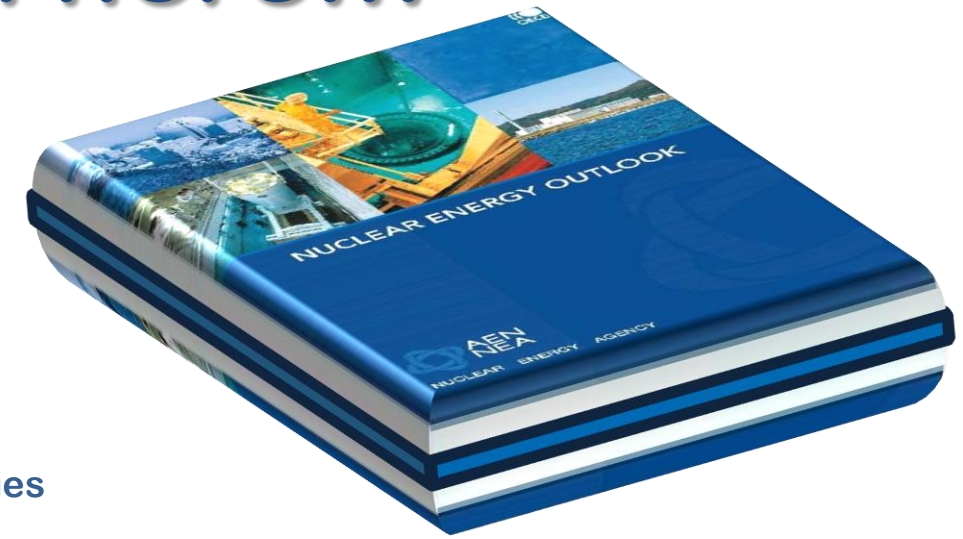
But!…

Governments have clear responsibilities:

- ensure maintenance of the skills base
- maintain continued effective safety regulation
- foster progress on facilities for waste disposal
- maintain and reinforce international non-proliferation arrangements
- provide the stability (policy, regulatory, fiscal) investors require

to enable nuclear energy's role in future sustainable energy mixes

The facts are all here…



Chapter 1. Current Status
Chapter 2. Programmes and Government Policies
Chapter 3. Projections to 2050
Chapter 4. Environmental Impacts of Energy Use and Power Production
Chapter 5. Uranium Resources and Security of Supply
Chapter 6. Providing Electricity at Stable and Affordable Costs
Chapter 7. Nuclear Safety and Regulation
Chapter 8. Radioactive Waste Management and Decommissioning
Chapter 9. Non-proliferation and Security
Chapter 10. Legal Frameworks
Chapter 11. Infrastructure: Industrial, Manpower and R&D Capability
Chapter 12. Stakeholder Engagement
Chapter 13. Advanced Reactors
Chapter 14. Advanced Fuel Cycles