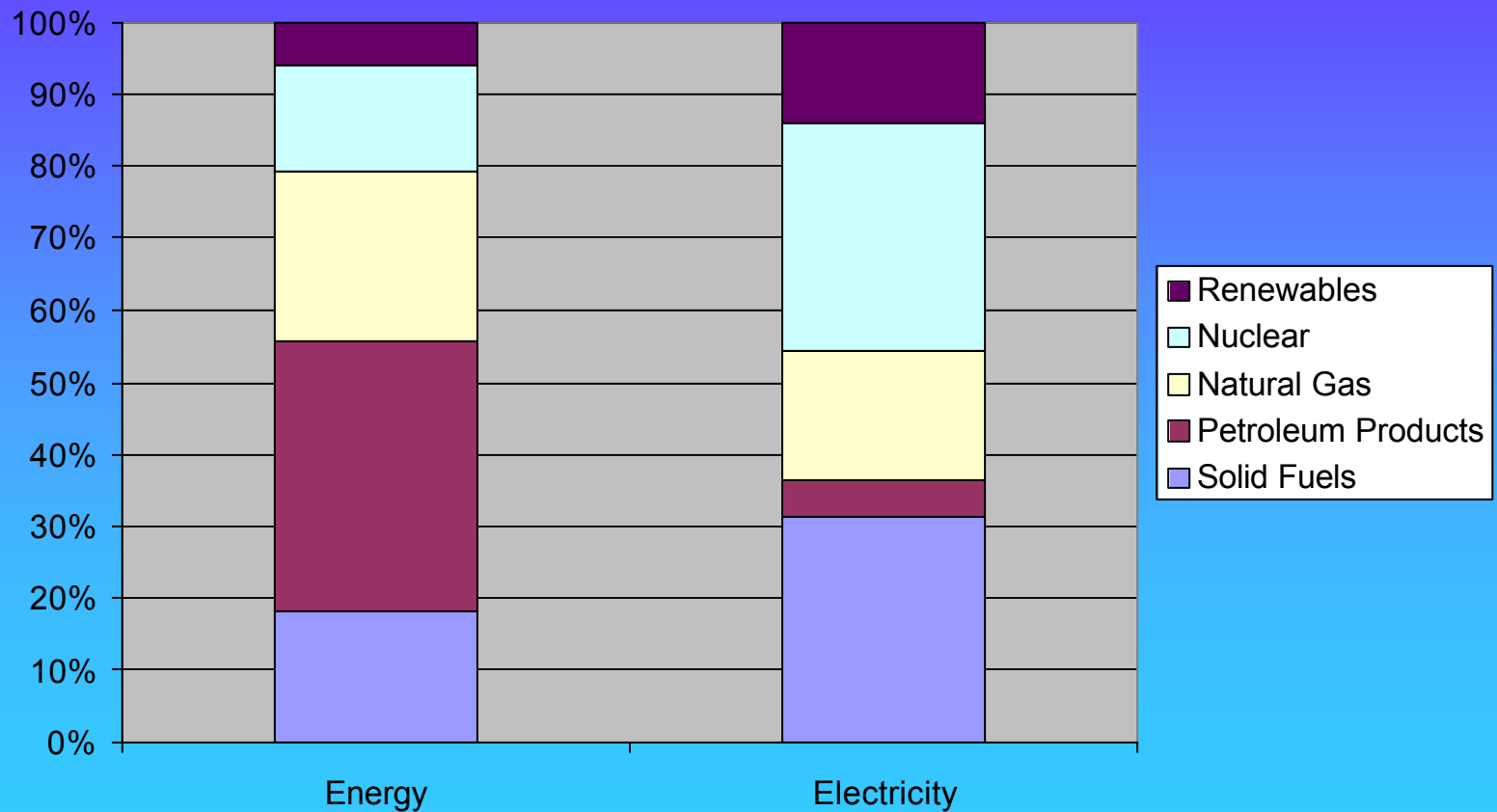


European Sustainable Energy Policy Seminar
Organised by
INFORSE-Europe, EUFORES & EREF
March 29th 2006, Brussels

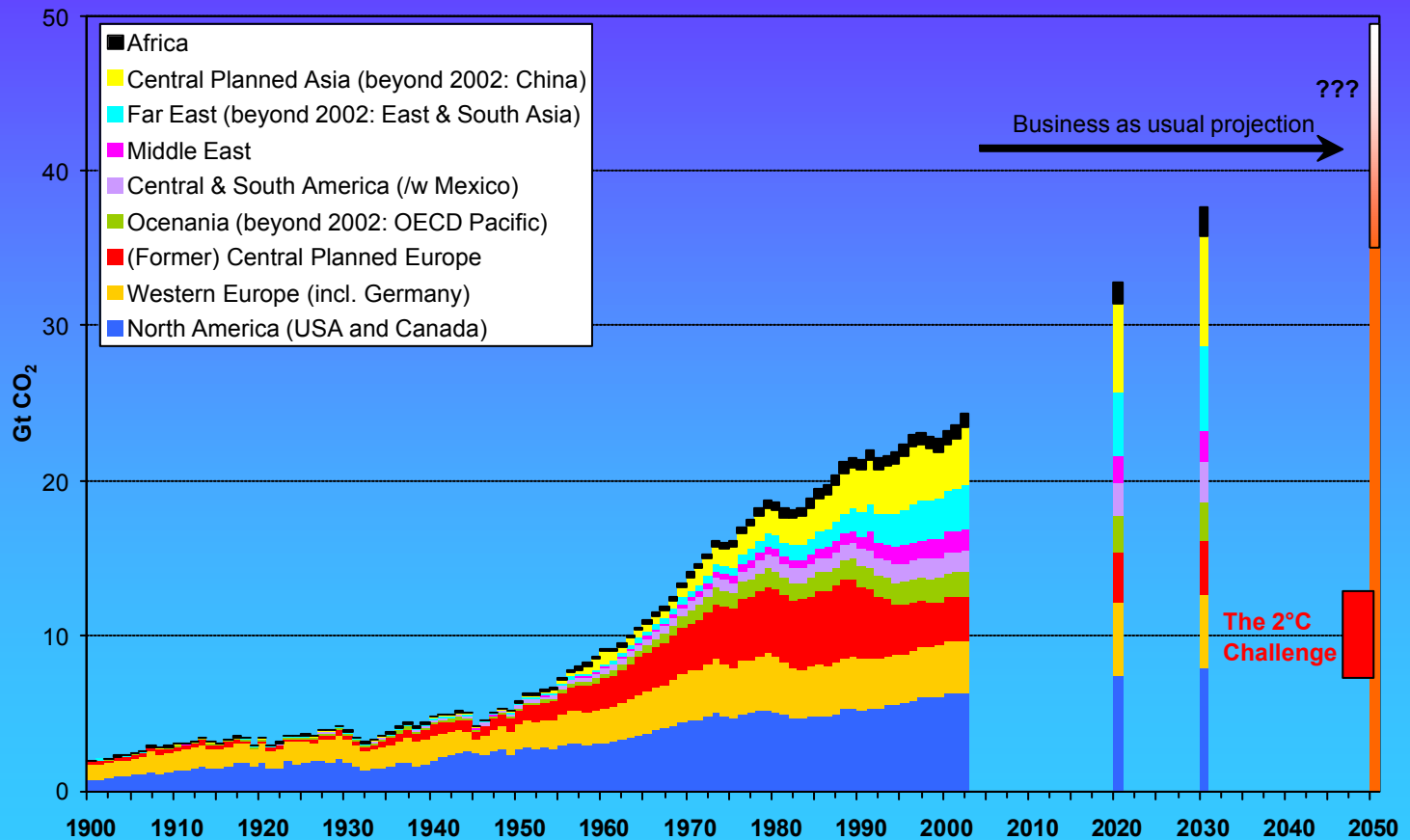
Public Funding For Energy

Antony Froggatt
Independent Consultant

Energy and Electricity Mix in Europe



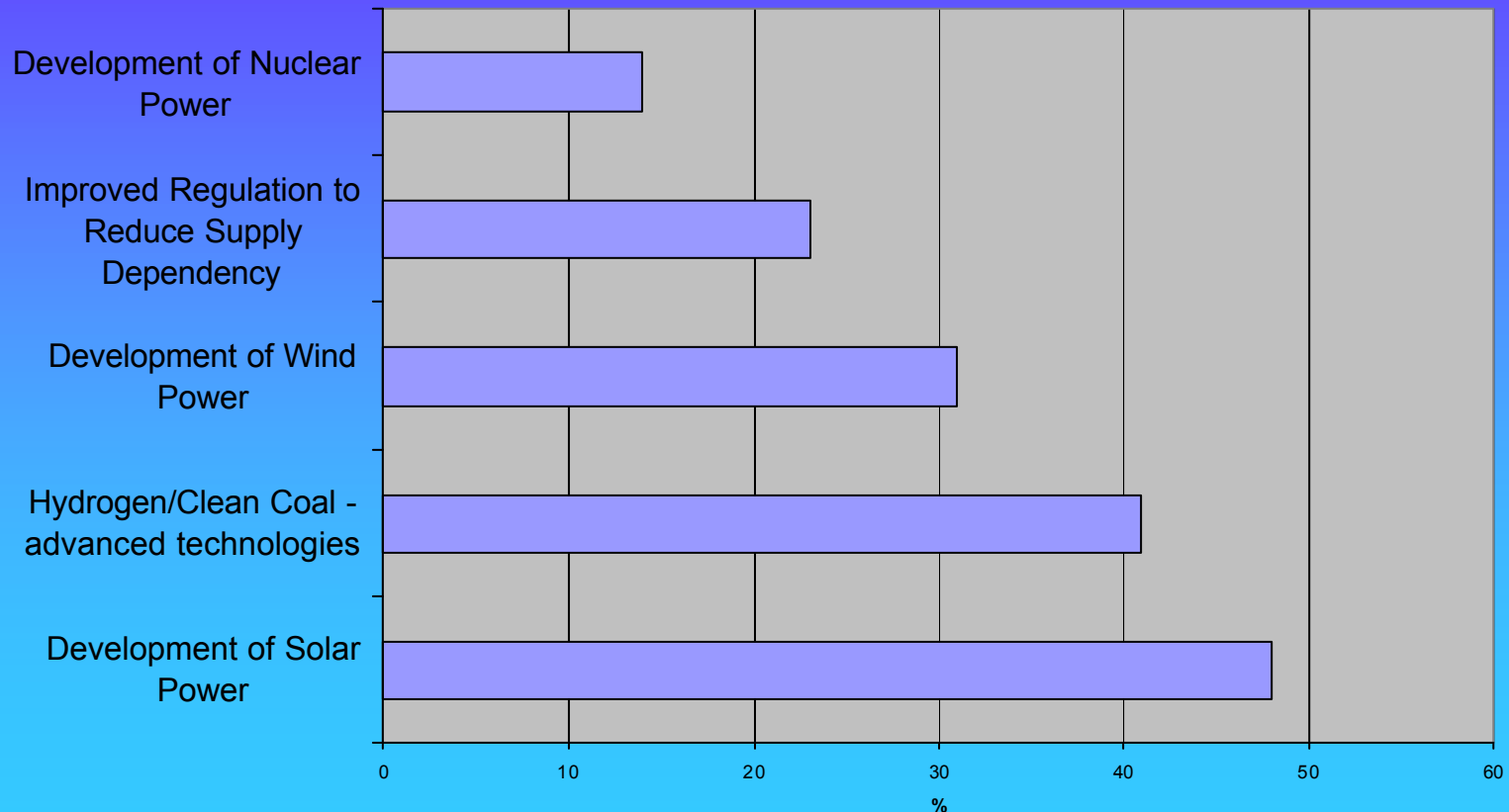
Expected CO2 Emissions Increase



Public View ?

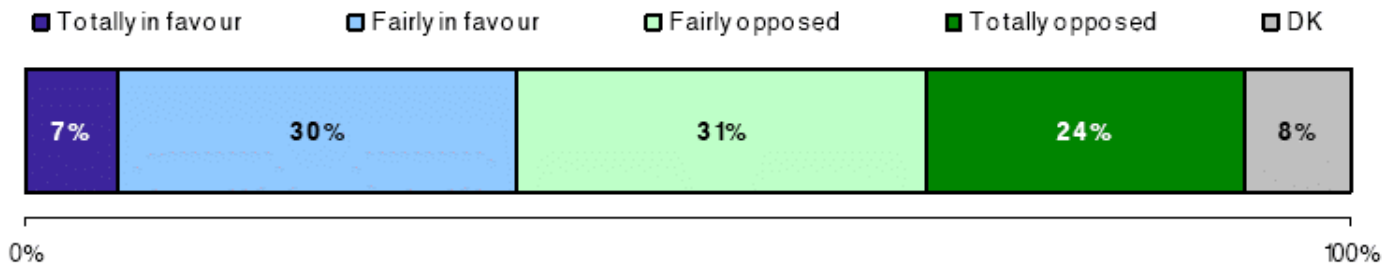


Which Technologies Should be adopted to increase security of Supply (2 choices)



Public Support For Nuclear Power

Q2. Are you ... to energy produced by nuclear power stations? % EU



Transparent Energy Sector

- All governments give financial support to their energy sectors and in particular to specific technologies.
- Historically and currently these have been given towards traditional energy sources. Through
 - Direct financial transfer (grants to producers and consumers)
 - Preferential tax treatment
 - Trade restrictions
 - Energy related services provided directly by government at less than full cost
 - Regulations of the energy sector

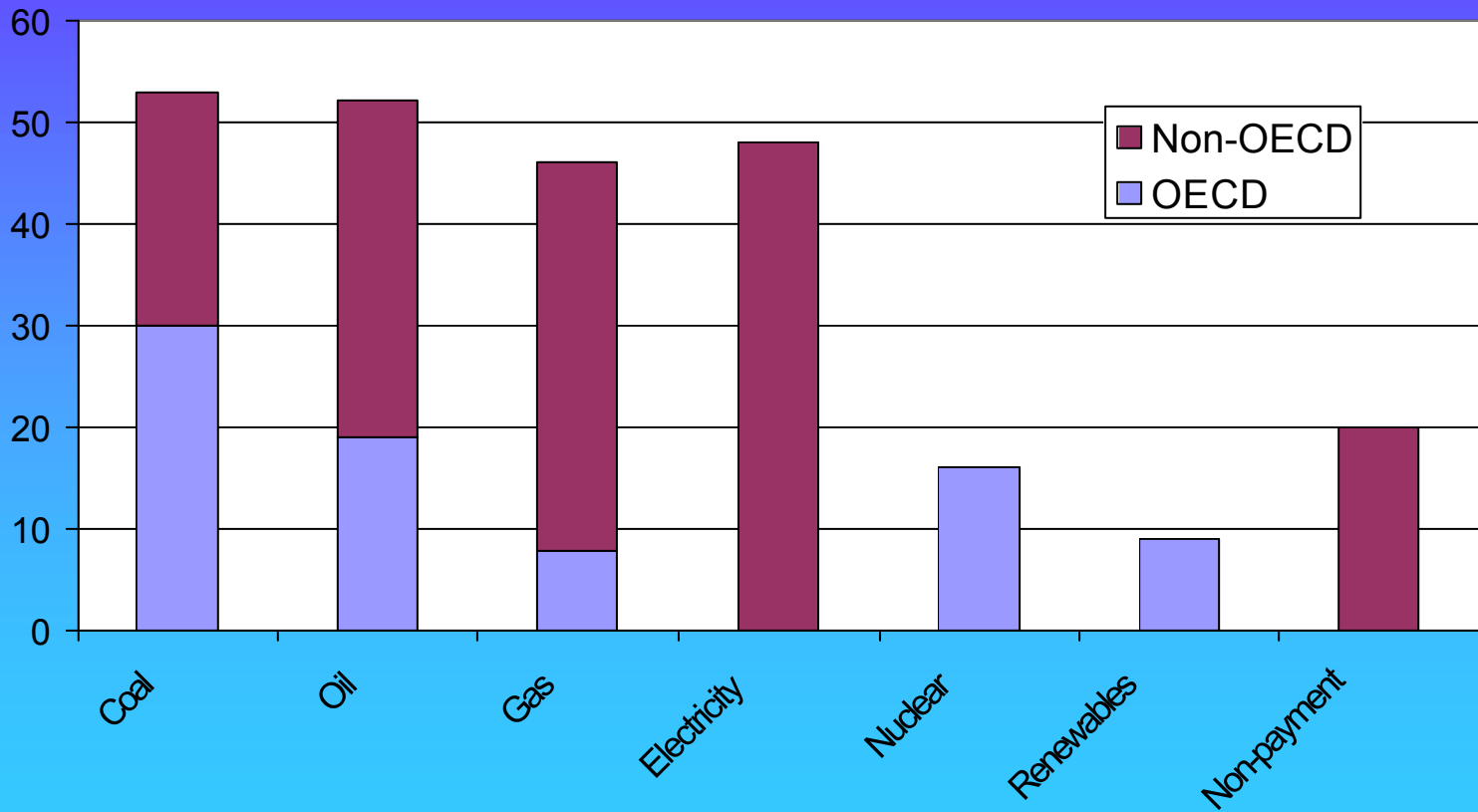
Targeting of Public Funds

- Analysis undertaken by Amory Lovins suggests:
 - Every \$0.10 spent on a new nuclear kWh could have resulted in:
 - 1.2-1.7kWh of Windpower
 - 0.9-1.7 kWh of gas fired
 - 2.2-6.5 kWh of co-generation
 - Several to 10+kWh of energy efficiency.
- There is an opportunity cost of different support schemes.

Subsidies

- The total revenues of the energy sector is approximately \$2 trillion per year.
- However, Governments continue to subsidise the sector.
- In 1998 global energy subsidies were approximately \$240 billion, of which 75% of fuel subsidies went to fossil fuels and 6% went to renewables and energy efficiency.

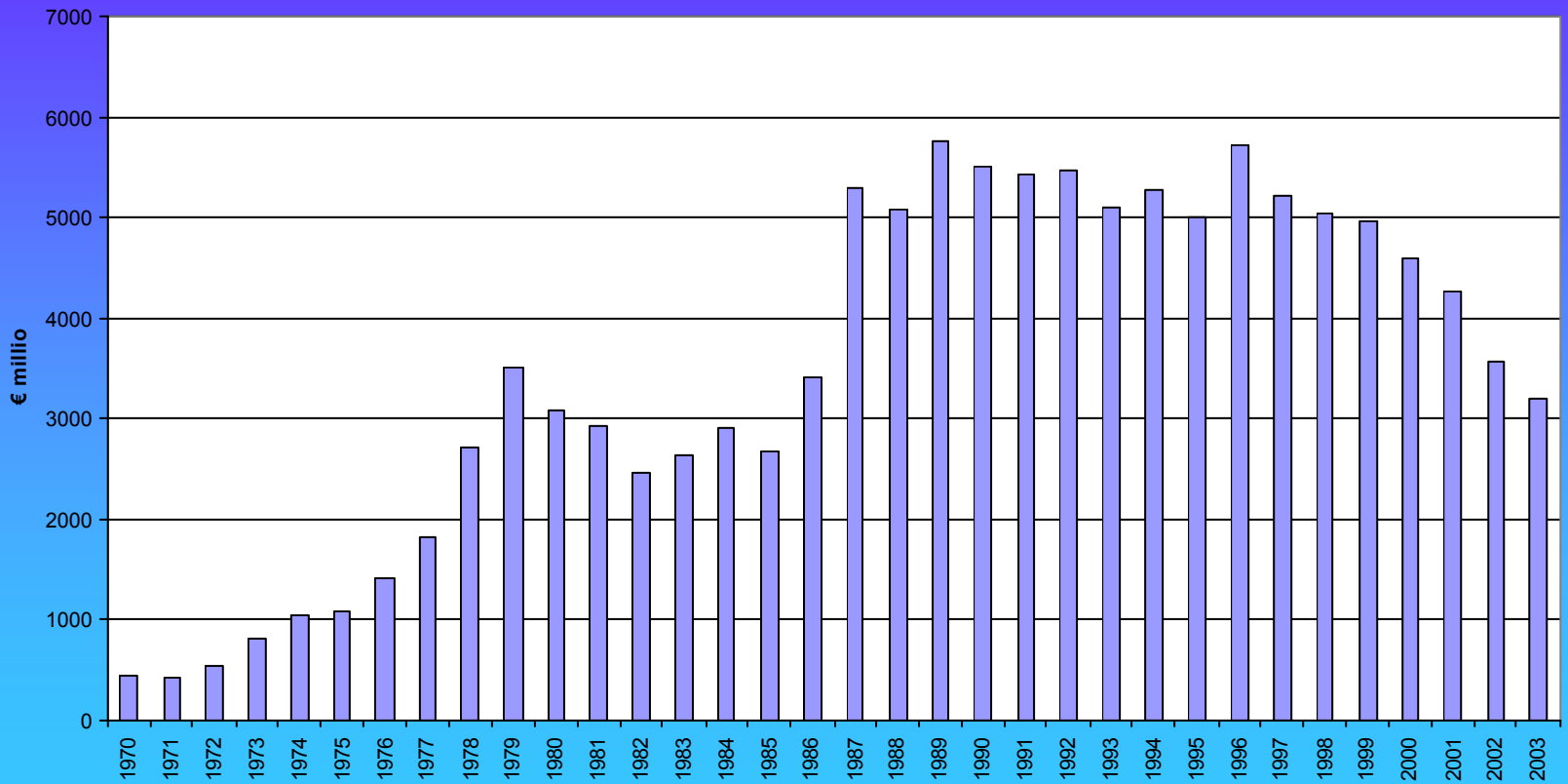
Energy Subsidies/Year (\$ billion)



Coal

- Over the last decade four 'old' Member States (France, Germany, Spain and UK) granted approximately €70 billion in aid to their industry for both production subsidies and to help phase out the industry.
- On average it cost EU tax payers an average of €40 000 per worker per year each coal worker between 1998-2000.
- In Germany alone around €120 billion was given to the coal sector between 1970 and 2003.
- The enlargement of the European Union has lead to additional State Aid claims for the coal sector with four new Members granting aid to the coal sector, and in particular Poland that granted €3.8 billion in 2003

Federal and State Support for Hard Coal Industry in Germany



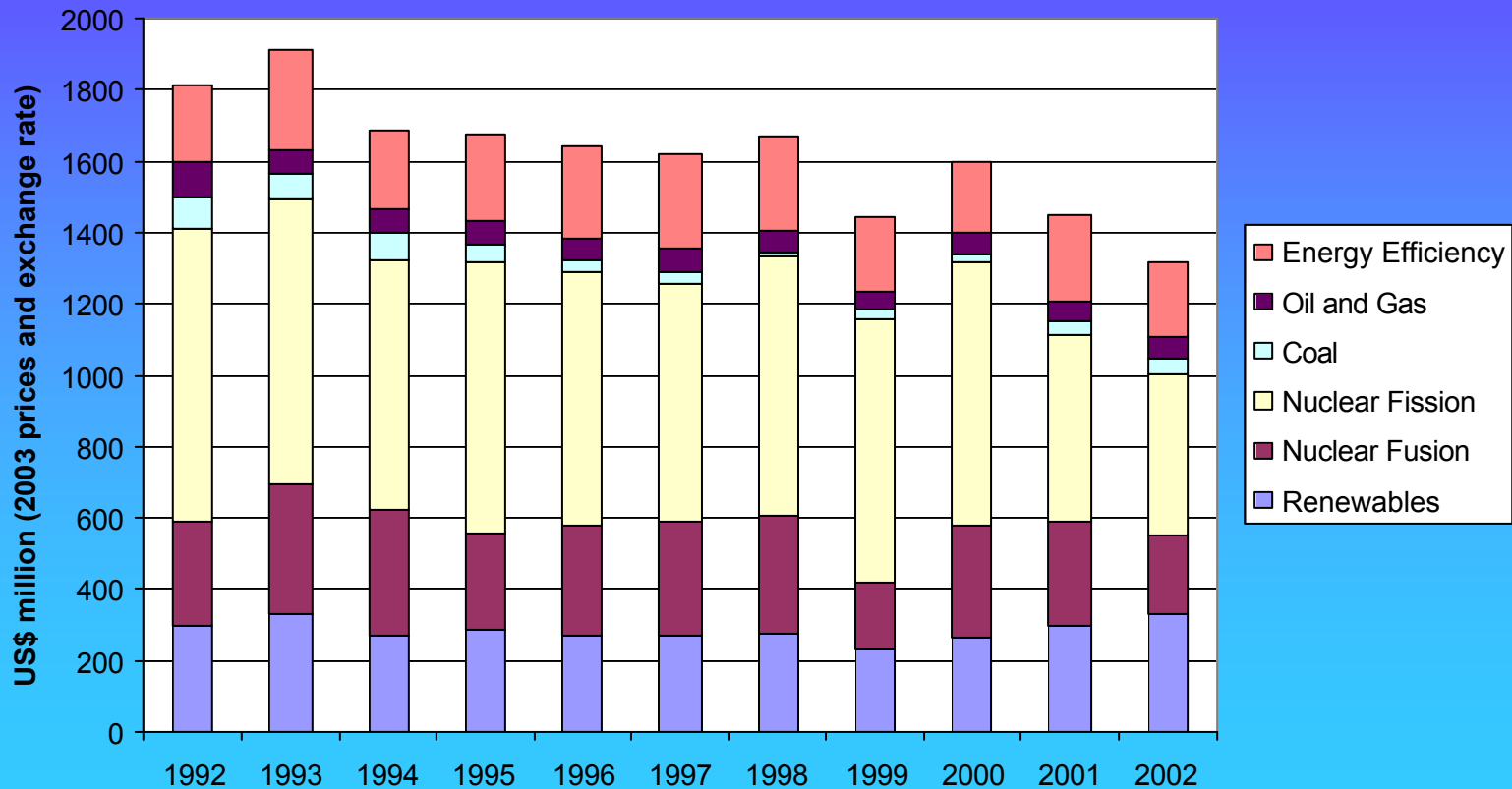
Specific Subsidies/Support for Energy

- Research and Development
- Financing
- External Environmental Costs

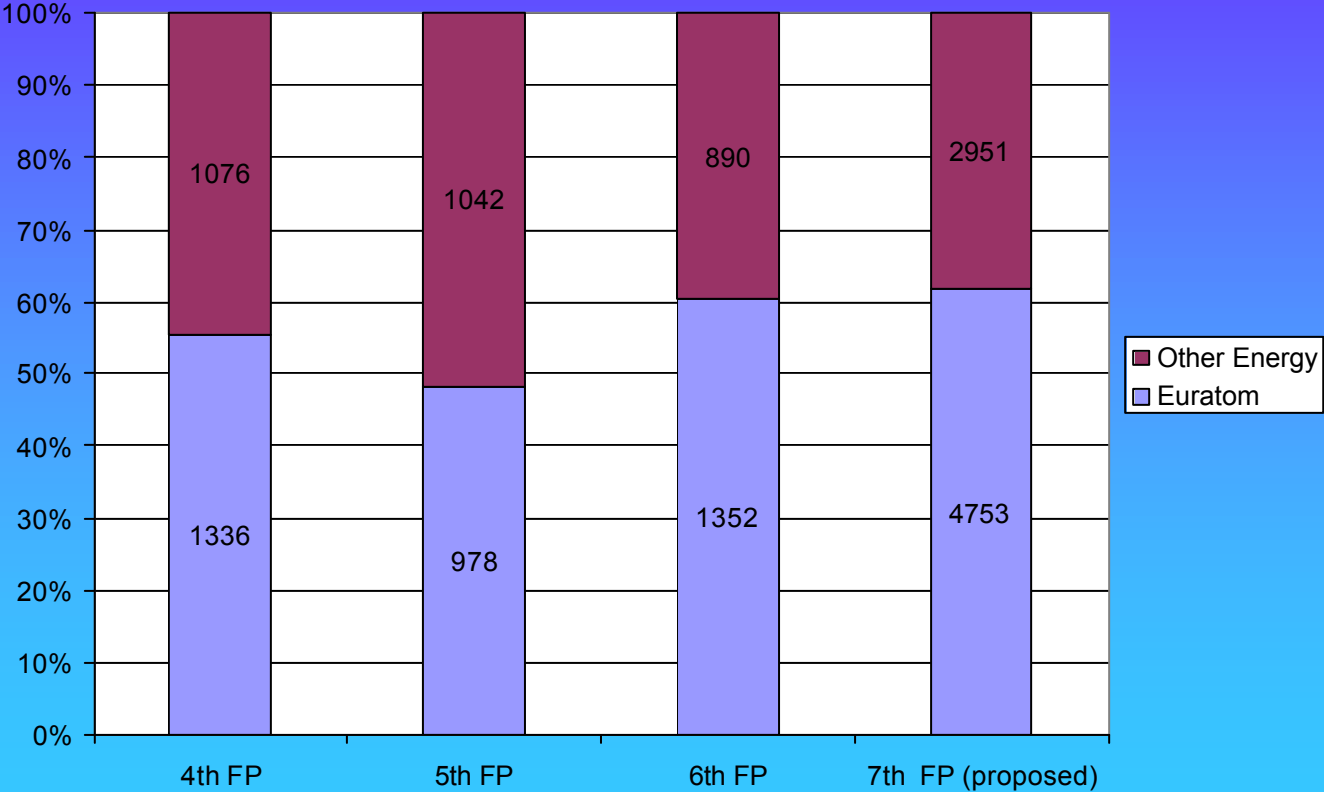
Research and Development

- Limited Government research and development funding must be allocated towards:
 - infant technologies
 - those in which the private sector is unable to fund the work
 - Expected to reach commercialisation soon, and
 - Widespread applicability
- Between 1974-2002, nuclear (fission and fusion) received \$169 billion in Government R and D grants from countries in the International Energy Agency, compared to \$24 billion for renewables.
- In 2002, Japan allocated more funding for nuclear fission (\$2.8 billion) than all the countries of the IEA combined allocated for energy conservation and renewable energy (\$2.4 billion).
- In their first 15 years of commercial operation, nuclear and wind technology produced a comparable amount of electricity in the United States, but the subsidy to nuclear was 40 times greater than that given to wind (\$39.4 billion to \$900 billion).
- The European Commission has estimated that between 1974 and 1998 Member States granted approximately \$55 billion for nuclear

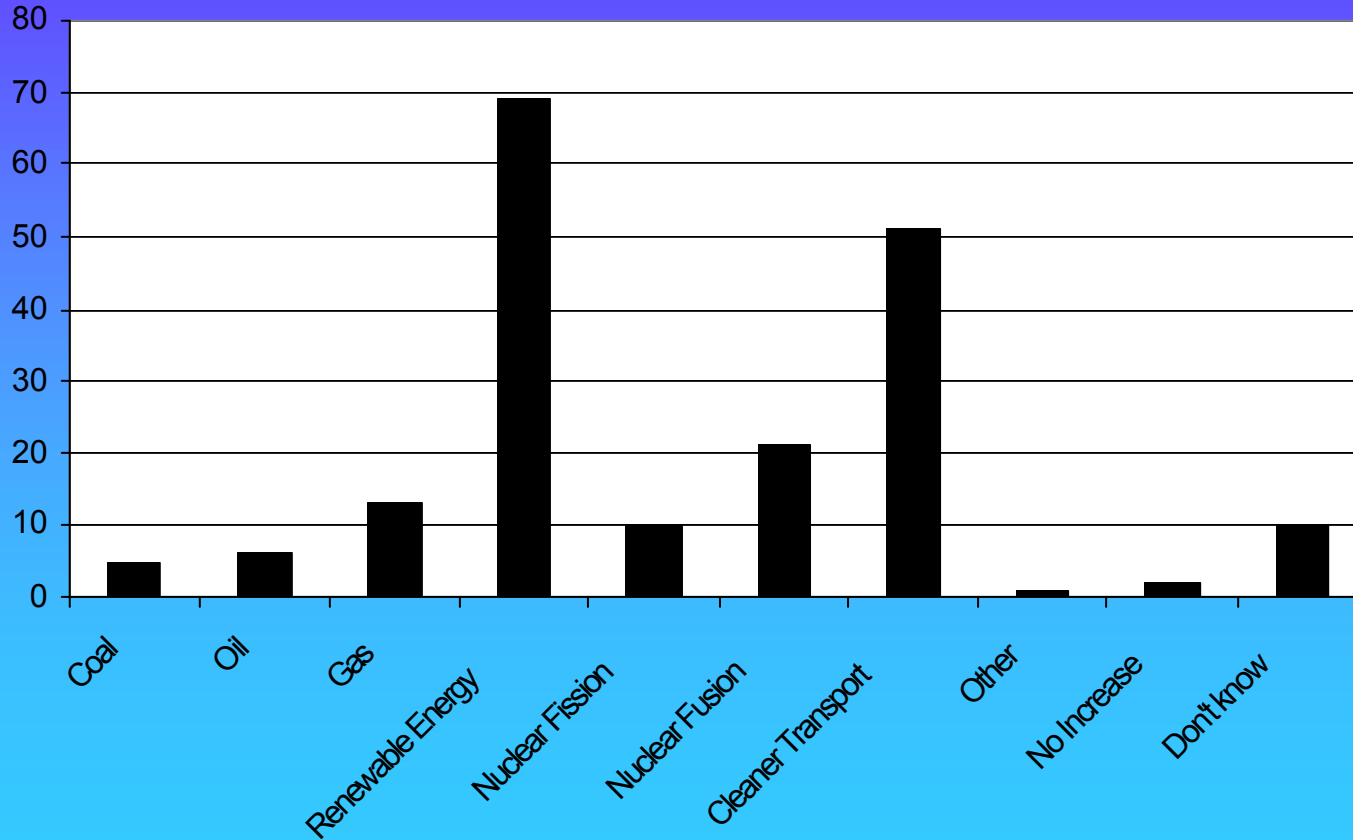
IEA-Europe Research and Development Funding



Comparison of EU Research and Development Funding



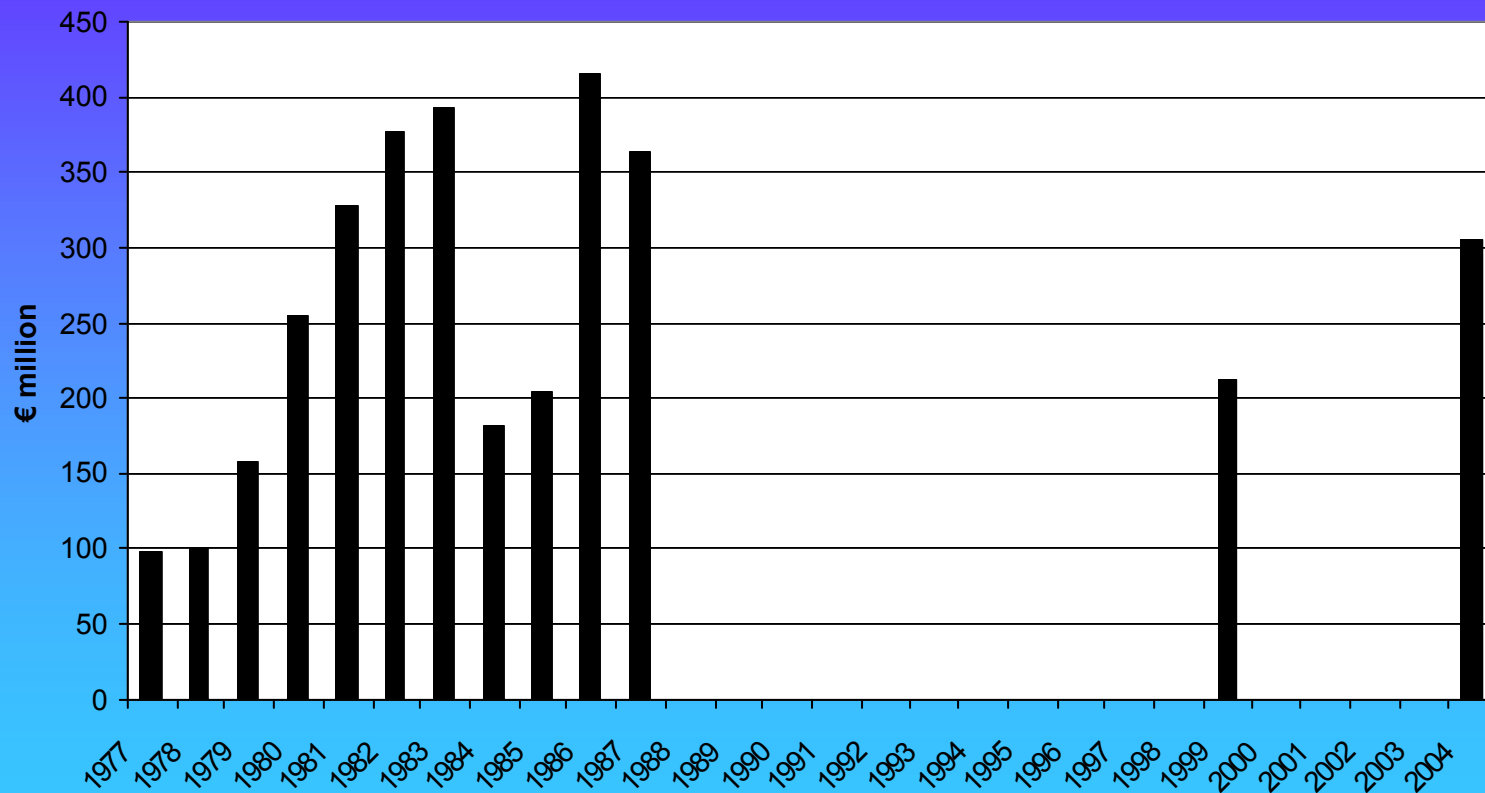
Public Suggestions for Additional Energy Research and Development



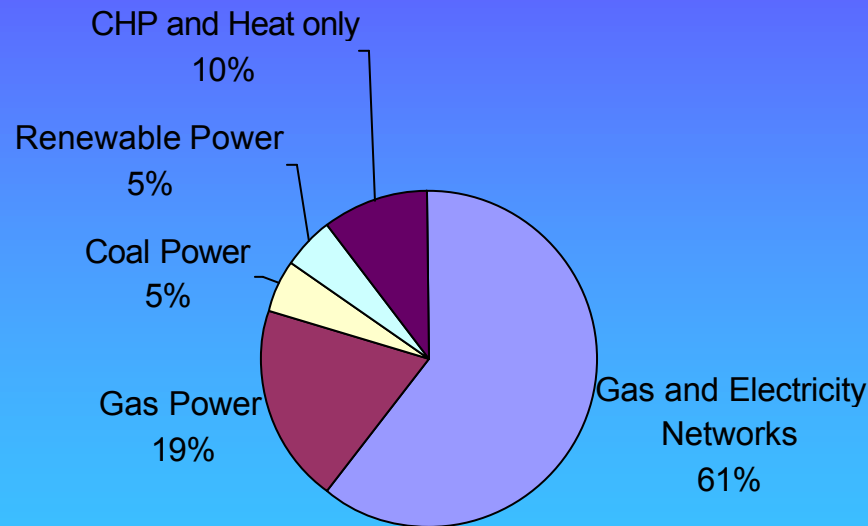
Financing

- Large Centralised generation tends to receive most funding from the large financial institutions, this is due to:-
 - To the lending structures – cheaper for them to give larger loans.
 - History of individuals – come from large utilities
 - Political mandate of organisations.
 - Lack of imagination and creativity.

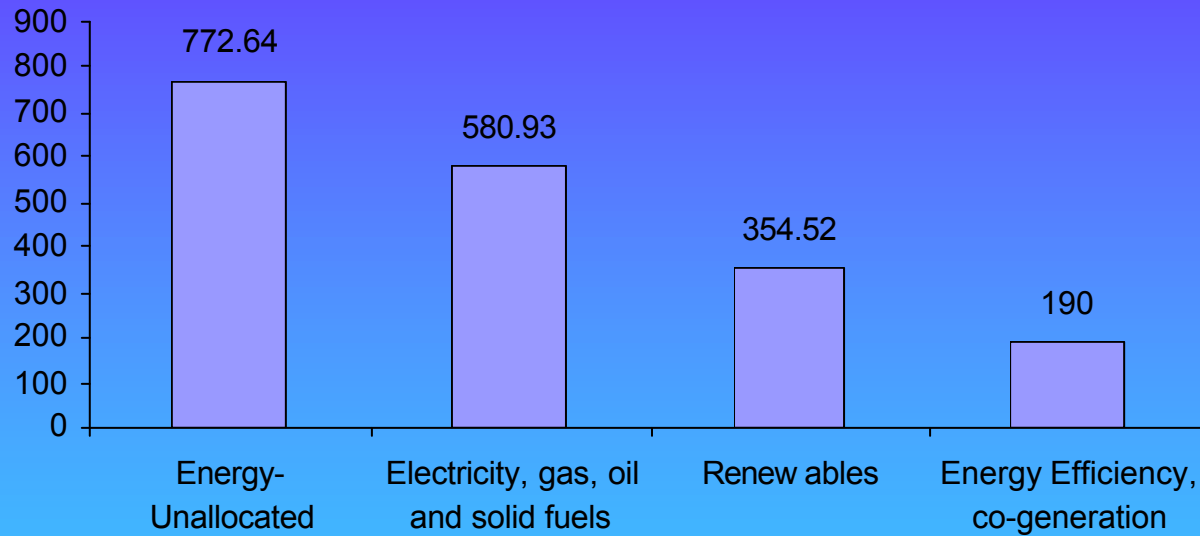
Euratom Loans



EIB Energy Sector Lending (1990-2004)



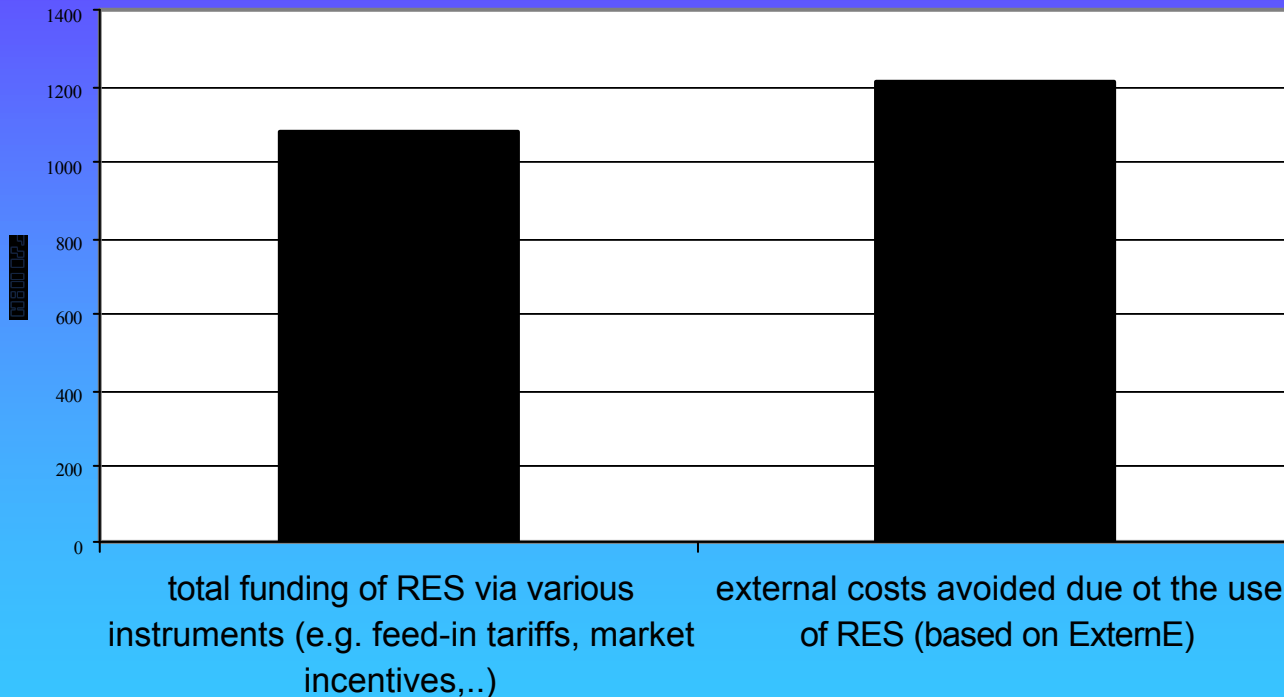
Structural Funds



External Costs

- The full environmental impacts of energy sources are not all included into the final cost of energy.
- The energy sector is a major contributor to climate change, the cost of which may well be up to \$300 billion per year.
- A joint EU-US study which assessed the economic cost of the environmental impact of different energy options concluded that *'cost of producing electricity from coal or oil would double the cost of electricity from gas would increase by 30% if external costs such as damage to the environment and health were taken into account.'*

Externalities Vs Renewables Support Schemes



Nuclear External Costs

- Nuclear external costs are often excluded, “Reliable values of accident, high level wastes impacts, nuclear proliferation and impacts of terrorism have not been developed in ExternE. These omissions may well be significant and therefore should be clearly noted in any assessment” – ExternE.
- If Electricité de France, were required to fully insure their power plants with private insurance but using the current internationally agreed limit on liabilities of approximately €420 million, it would increase EdF’s insurance premiums from 0.0017c€/kWh, to 0.019 c€/kWh, thus adding around 8% to the cost of generation. However, if there was no ceiling in place and a operator had to cover the full cost of an worst cost scenario accident it would increase the insurance premiums to 5 c€/kWh, thus increasing the cost of generation by around 300%

New Subsidies

- Fears about climate change and security of supply have lead to renewed interest in nuclear.
- The industry is promoting itself, with higher oil and gas prices, as competitive.
- However, current experience suggests new subsidies will be needed.

US Support Program

- Production Tax Credits: 1.8 cent tax credit for each kWh from new reactors for 8 years for six reactors: cost to US treasury \$5.7 billion.
- Loan Guarantees for first 6-8 reactors. Congressional Research Service estimate taxpayer liability would be \$14-16 billion.
- a support framework against regulatory or judicial delays, worth up to \$500 million for the first two reactors and \$250 million for the next four.
- Further research and development funding worth \$850 million.
- Assistance with historic decommissioning costs (up to \$1.3 billion).
- It is thought that the total cost of this nuclear support programme is around \$12 billion (£7 billion).

New Energy Policy For Europe

- Published by European Commission, 8th March 2006.
- Calls for Strategic EU Energy Review, which could.
 - Aim for a minimum level of the overall EU energy mix originating from secure and **low-carbon energy sources**.
 - Such a benchmark would reflect the potential risks of import dependency, identify an overall aspiration for the long term development of low carbon energy sources and **permit the identification of the essentially internal measures necessary to achieve these goals**.

Conclusion

- The traditional industries have received and continue to receive vast direct and indirect subsidies
 - Research and Development
 - Tax breaks
 - Lack of accountability of environmental costs
- Renewables current are receiving funding, but this at best covers the external environmental costs.
- A new nuclear build programme will require additional Government financial support or guarantees.
- If allocated these funds or resources will not be available for other technologies.