Radioactive waste management
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The European political perspective

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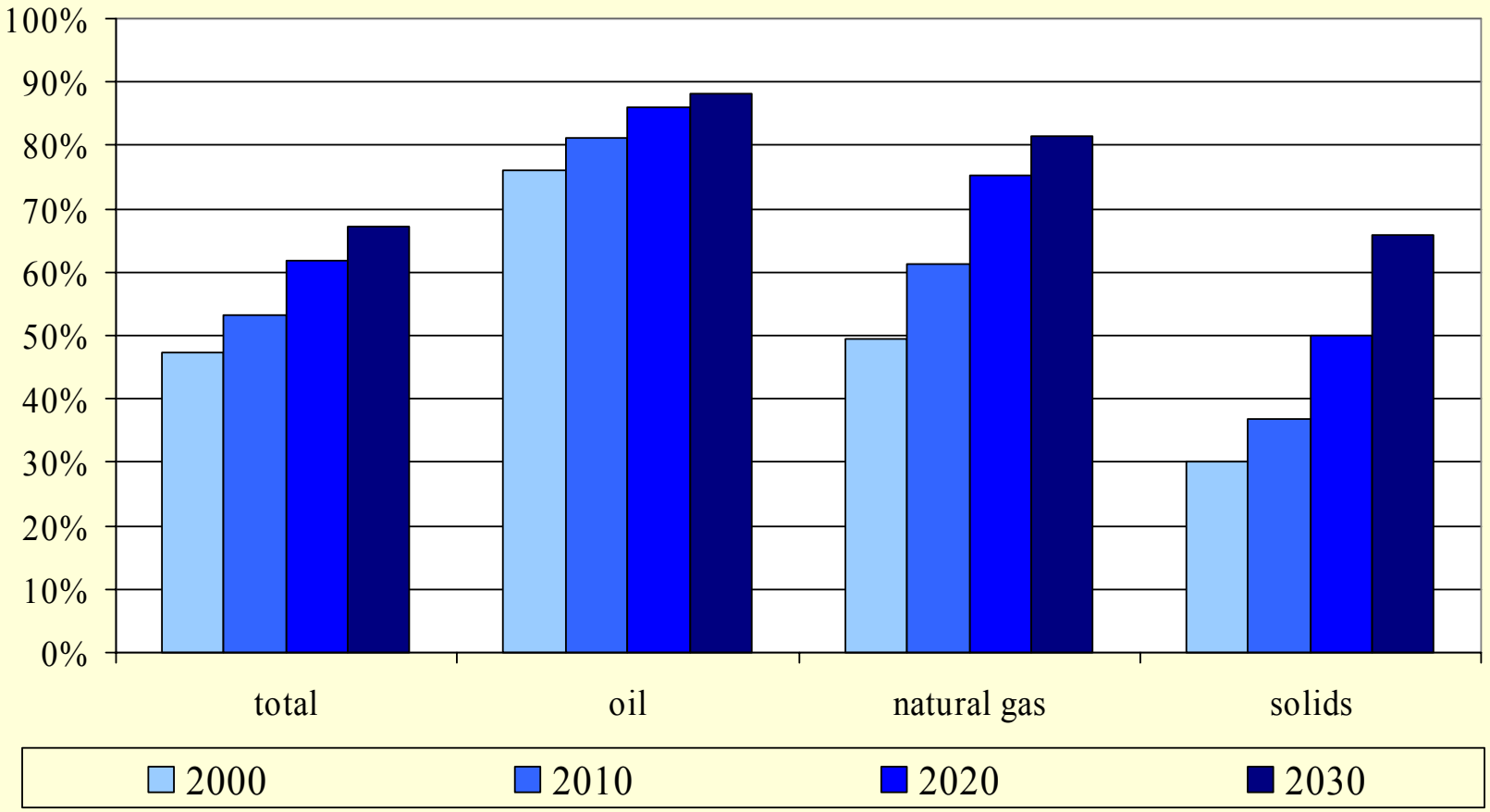
Summary

- Why is radioactive waste an important issue in Europe?
- Public opinion about waste
- Some facts about waste in Europe
- Proposals for European legislation
- The “Waste Directive”
- The way forward

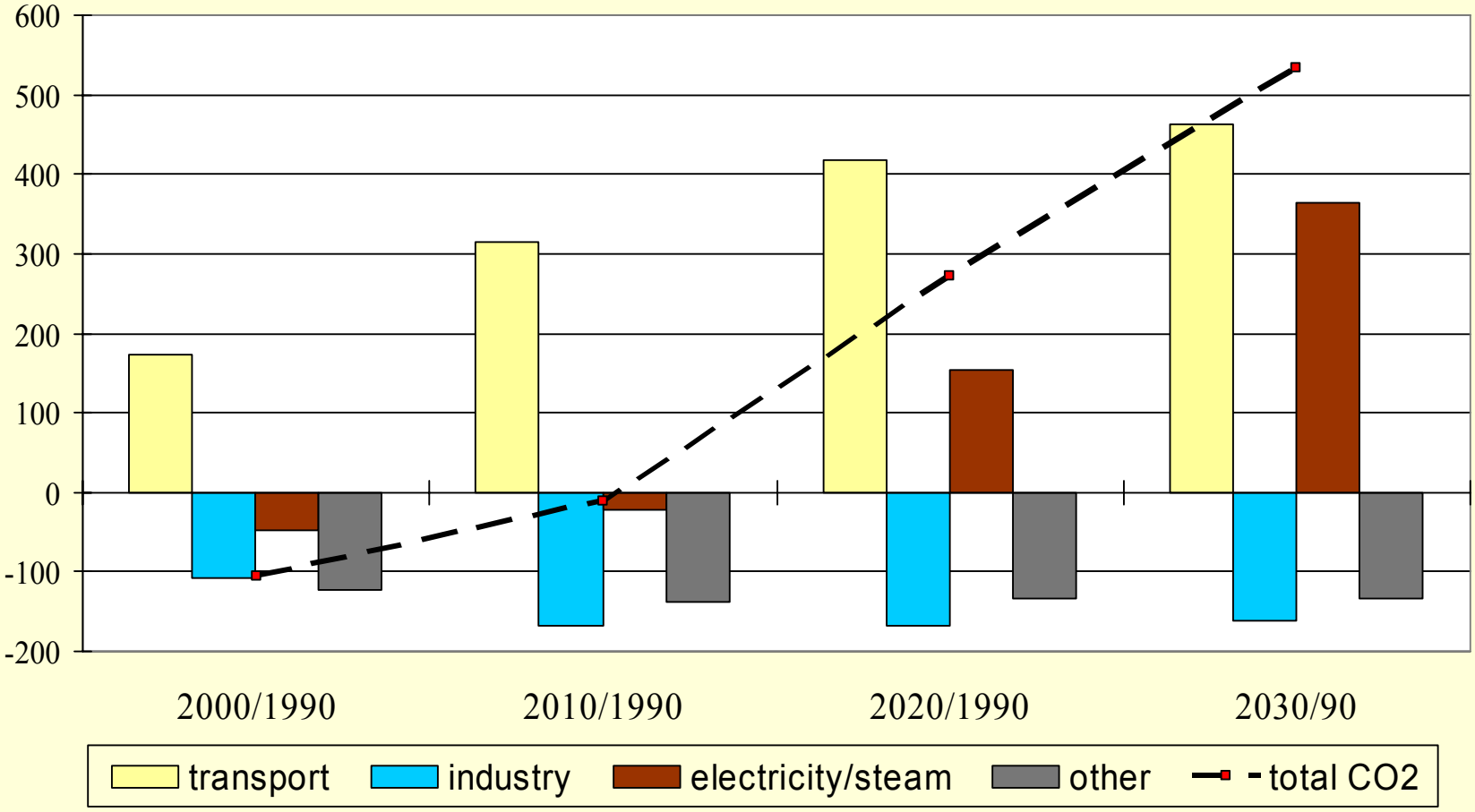
Energy demand

- By 2030, the demand for energy in the EU will increase by around 30% from its present levels.
- The demand for electricity may increase even faster
- A growing share of the demand will be met by imported fuels
- Burning these fuels will increase our CO2 emissions

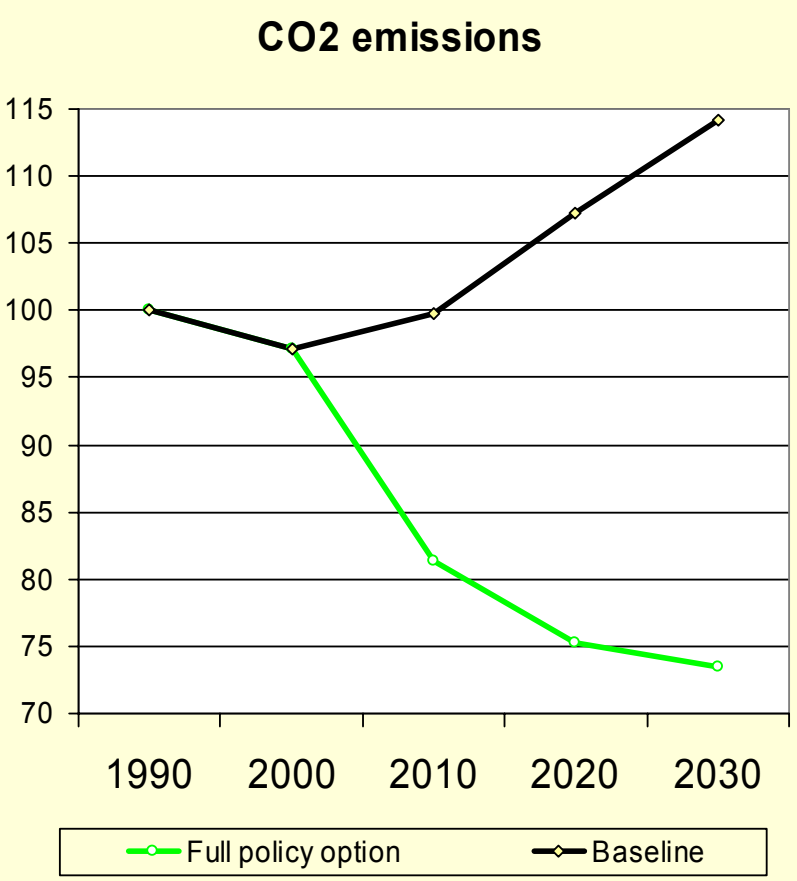
Import dependency (%) by fuel

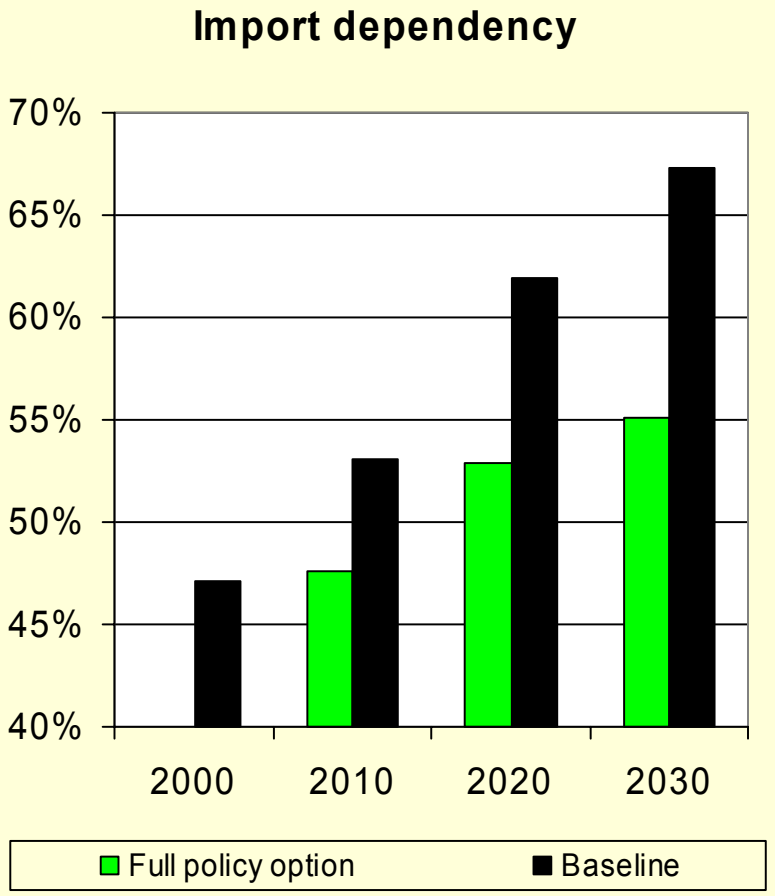


Change in CO_2 emissions



But with increased efficiency, more renewables ***and*** nuclear energy …





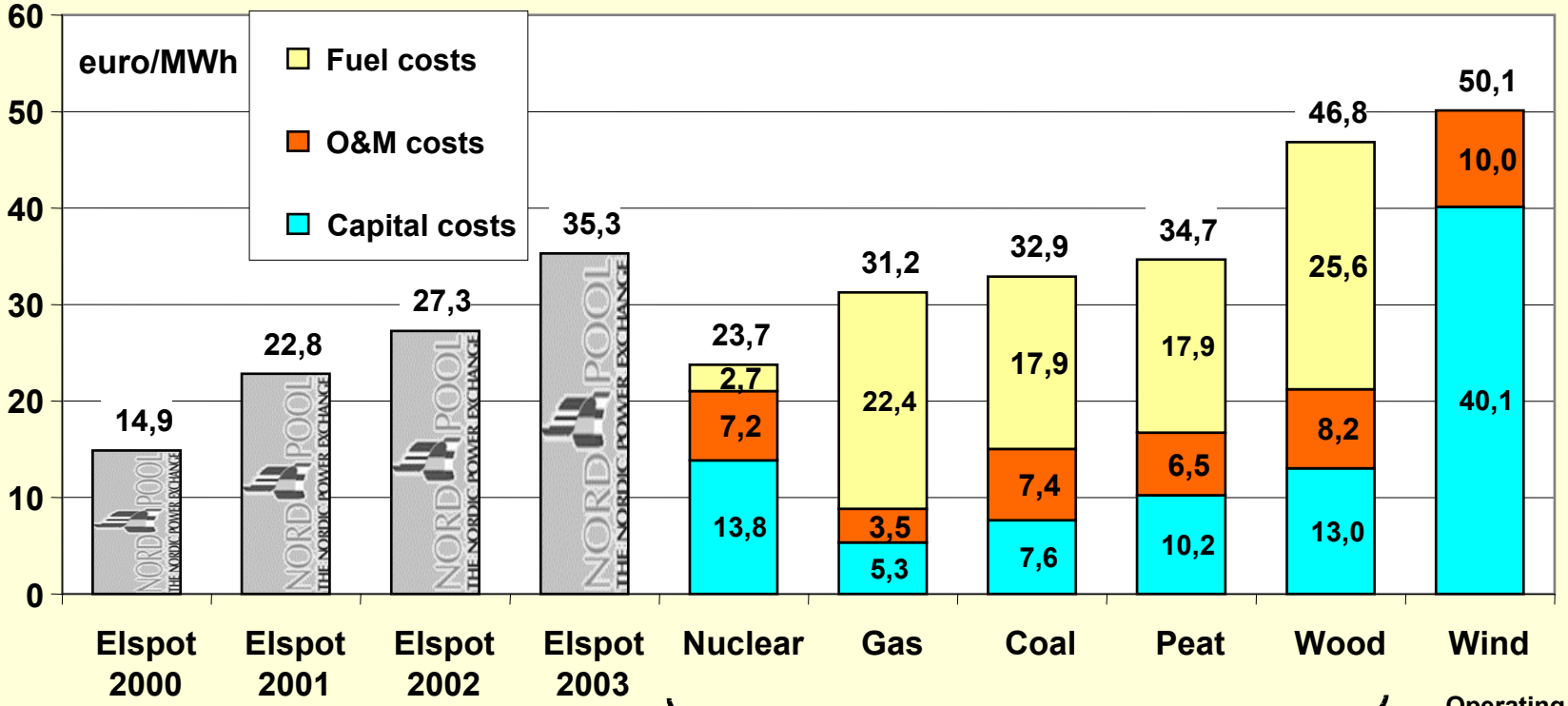
Nuclear energy in the EU

- In the European Union nuclear energy has produced, during the last few years, over one third of the total electricity generated and consumed.
- Nuclear energy plays an important role in the diversity and security of the European Union's energy supply.
- **As a direct result of its negligible emission of greenhouse gases, its use results in important environmental benefits**.

And a small question of cost ….

- We all know that the oil price is high – and may not come down rapidly without major new investment in production and refining
- The gas price has tracked the oil price in many regions.
- Even the coal price is well above what it was 2 years ago
- Fuel cost increases result in increases in electricity generating costs
- Emission trading also adds significantly to generating costs – and to prices of electricity

Projected cost of electricity from a new plant in Finland



Real interest rate 5,0%
March 2004 prices

Generation costs without investment subsidy and the return of electricity tax (wood and wind)

Source: R.Tarjanne & K. Luostarinen 06.04.2004
Lappeenranta University of Technology

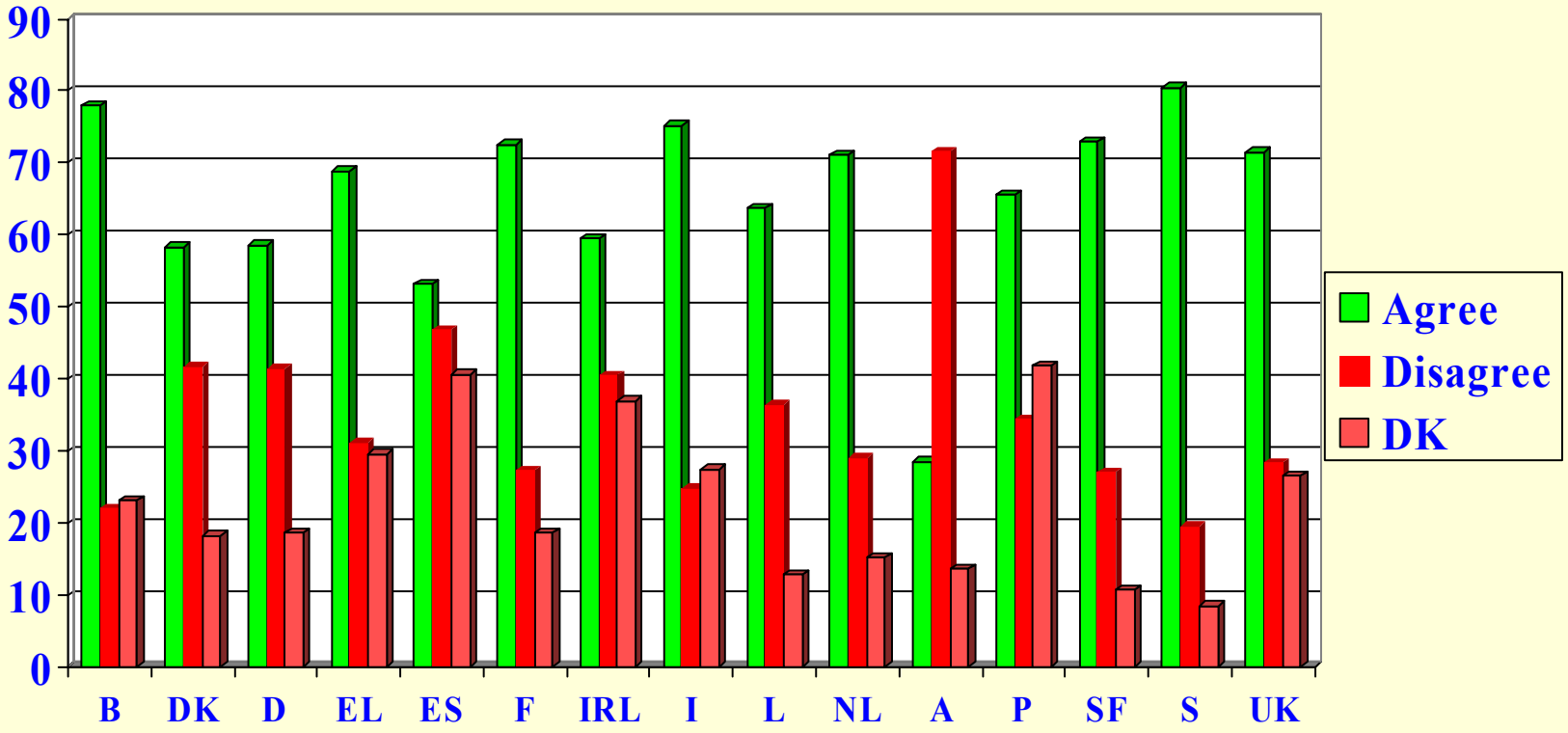
Need for nuclear

- Nuclear energy:
  - Is an economic form of electricity generation (it can result in long periods of price stability)
  - It has important environmental benefits, in particular the CO2 avoidance – but also it can contain and manage all its wastes
  - It increases our security of supply by reducing our dependence on imported fossil fuels
- Therefore we ***need*** it as part of our energy mix – <u>at least</u> at the same level as now …

Public acceptance

- It is widely ***perceived*** that nuclear has a major problem of "public acceptance"
  - Some people attack nuclear about it costs
  - Others even attack it as a contributor to climate change, ***but***
- The main issue ***seems*** to be nuclear safety and, in particular, the safe management of radioactive wastes

Should the option stay open – if waste can be safely managed?



The importance of the waste issue

- We need nuclear energy as part of our energy mix
- However, nuclear is ***perceived*** to have a problem with public acceptance
- One of the deciding factors regarding public acceptance of nuclear ***appears*** to be the safe management of the wastes
- Therefore we need to make progress - and be seen to make progress – on the safe long-term management of radioactive waste

A few facts about waste in the EU

- The EU-25 produces around 45 000 m3/year in total
  - Equivalent of 1 small wine-glass/person (<100ml)
- Between 95 and 99% of this is “Low-level” or “Short-lived”
  - Over 2 million m3 already disposed of in the EU
- Remainder – around 500 m3/year – is “High-level” or “Long-lived” waste.
  - None of this disposed of so far

Compared with “other” wastes

- About 2 billion tonnes/year in EU – about 4 tonnes/person (EU-15)
- 35 million tonnes of “hazardous waste” – 80 kg/person (EU-15)
- Disposed of in 55 000 sites – around half in a “critical state” (EU-15)
- ***PLUS:*** 3.75 Billion Tonnes of CO_2 – *from energy use* (EU-25) (over 9 t/person)

The Commission's view in 2002

- The most important problem faced by the nuclear industry regarding greater development of nuclear energy was that of Public acceptance.
- This was related to two main issues
  - the **safety and security of nuclear installations**
  - the absence of a clearly defined and established route for the safe, long-term management of some of the more **hazardous radioactive wastes**

The Nuclear Package

- In late 2002 and early 2003 the Commission adopted a package of policy documents and legislative proposals known as the “Nuclear Package”
- This included two pieces of legislation to specifically address the safety and waste issues
  - The “Safety Directive”
  - The “Waste Directive”

The “Safety Directive”

- Takes the methodology that the Member States used to evaluate the level of nuclear safety in the candidate countries in 2001
  - This methodology is based mainly on national reports and peer reviews by nuclear regulators
- Formalises the methodology into European law
- Then it can be routinely applied to all Member States – both old and new - in an enlarged European Union.

The “Waste Directive”

- Objective to bring about progress on safe long-term management of waste
- Covers all waste forms – but emphasis on HLW
- Requires Member States to set up programmes – with specified timetable
- Regular reports subjected to Peer Reviews by experts from other States

Some criticism and changes

- Over-emphasis on geological disposal
- Problems of shipments to third countries
  - "Threat" of regional repositories
  - Risk of dumping of wastes

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- *Inclusion of "deadlines" for choosing sites and starting disposal*
- *Over-emphasis on research*
  - *Setting up "Joint Undertaking"*

Geological disposal

- In the Commission's view, geological disposal is both a safe and available technology
- In fact, geological disposal is presently the ***only*** safe ***and*** sustainable technology available today.
- At or near surface storage is not a safe ***and*** sustainable solution for the long-term. It is an interim measure.
- Partitioning and Transmutation (P&T) should continue to be researched – but there is no certainty that it (especially "T") will be – *or even could be* - used extensively.
- It is regarded as very unlikely that many of the present day waste forms – in particular vitrified high-level waste – will ever be subject to P&T. Therefore a route is needed for them. Geological disposal will be that route.

Where are we now?

- Proposals have been reviewed, discussed, analysed, debated, criticised, praised …
- By The European Parliament, the Member States – separately and in the European Council, by industry, nuclear societies, waste management agencies, NGOs..
- The **large majority** have been in favour
- But by Summer 2004 the Council had failed to adopt the proposed legislation.
- The Council then set up a Working Party (the WPNS) to review the proposals
- The Working Party will report towards the end of 2006 after which a decision ***should*** be taken on the way forward.

The need for progress

- In the Commission's view, the Waste Directive should be adopted quickly.
- Adoption of the Directive would be an important step forward – especially in those States that have so far made little – or too little – progress on waste.
- It is very difficult to justify the extension or expansion of nuclear programmes without addressing in an open and transparent manner the waste issue.
- The fact that Finland has already selected a site for its geological repository was a key factor in the Commission giving a positive opinion on the investment in the fifth Finnish plant (Olkiluoto-3).

A few facts ….

- Nuclear power provides the EU with one-third of all its electricity
- I would expect nuclear to at least maintain this share in the medium to long term
- We will certainly have NPPs operating well into the second half of the century – and probably well beyond
- They will still be producing waste
- So waste management will continue to be an inevitable consequence of electricity production
- Fortunately, the long term management of waste is technically achievable to a high level of safety

….and some misconceptions!

- What the Public might want - or expect - cannot be guaranteed to happen!
- Several of people's expectations concerning the future of energy supply are somewhat unrealistic. For example: by 2030 or even by 2050:
  - Renewables are **very unlikely** to produce most of our energy
  - Renewables are **very unlikely** to be the cheapest form of energy
  - Nuclear fusion **will not** produce more energy than nuclear fission.

The need for decisions

- *We must NOT expect the Public to demand nuclear energy.*
- *Nuclear power is an area where policy makers and decision takers need to listen to the Public – but to* ***take the lead*** *rather than be led.*
- ***My personal feeling from reviewing over 20 years of public opinion surveys is that the public are not – in general – that agitated about the issue of nuclear energy.***
- *Therefore, politicians should not regard nuclear energy as a "vote loser" – and should take their decisions on the basic of* ***energy security, environmental impacts and cost.***

Conclusions

- Nuclear energy **can** (and, at least for ***many*** States in the EU ***will***) provide:
  - increased security of supply
  - a means to protect the environment, especially against climate change
  - the most economically competitive form of electricity (and, in many instances, increased employment) – with predictable prices
- Future generations could come to thank those who have worked hard to develop and improve nuclear technology - ***but only if we do not compromise on our commitment to its safe management - especially of its wastes.***