

# Competitive advantages and disadvantages of nuclear energy in the EU low carbon economy and a global energy security context

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# Situation today:

Increasing CO<sup>2</sup> emission

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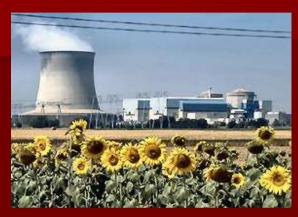
Global warming

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Global problem

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We need a common solution



















# Current key topics in the EU:

ENERGY, ENVIRONMENT and R&D POLICY

#### **Objectives:**

- balanced energy mix guaranteeing a secure energy supply for EU
- increasing efficiency of power plants with clean use of fossil fuels

#### Focus:

- European energy and climate packages
- SET-plan



# Nuclear energy – what does it mean for Europe?

- major role in the fight against climate change
- one of the largest and cheapest low-carbon energy sources in Europe
- less vulnerable to changes in the cost of primary fuel source, reduces import requirements
- Delivers energy to customers at competitive and affordable prices
- individual Member States decide on its use
- Commission gives priority to nuclear safety and security, decommissioning and waste management

# Nuclear energy – what does it mean for Europe?

- CLEAN
  - no CO<sup>2</sup> emission
- EFFICIENT
  - cost effective energy supply
- FLEXIBLE
  - high controllability and flexibility
- HIGH SECURITY OF SUPPLY
  - no critical import dependency, enough uranium resources



# S&D Characteristics of new built

- Extensive period of planning and construction
- Large units with high investment
- In general, joint ventures needed
- Increased know-how and resources are needed from manufacturers, service industry, licensing authorities, external experts and investors

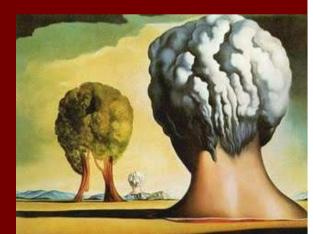
# Nuclear investments and the changed climate

- Issues surrounding nuclear technology:
  - Limits of uranium supply
  - Finance
  - Maintaining and improving safety performance standards
  - Technology and workforce
  - Used fuel disposal and management
  - Non-proliferation and physical security

# Key issues

## Resource management

- Financial resource management
- Natural resource management
- Knowledge management



### Financial resource management

#### Long time return investment is an issue

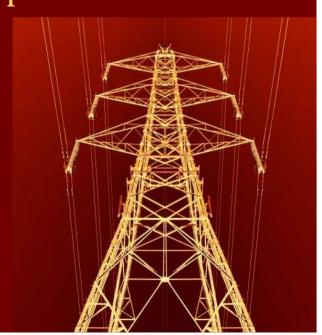
- Last pick for energy investment: in 60s
- Average age of POWERPLANTS in Europe: 37 years old, PIPELINES aren't much better
- INVESTORS had better sectors to move in
- Obtaining the necessary funding through guaranteeing safety, security and political support
  - focus on the role of nuclear energy in the low carbon future
  - focus on storage facilities for used fuel on the long run

## Financial resource management

Answer of European decision-makers

guaranteeing reliable and predictable political climate:

- Third Energy Package
- Climate Package

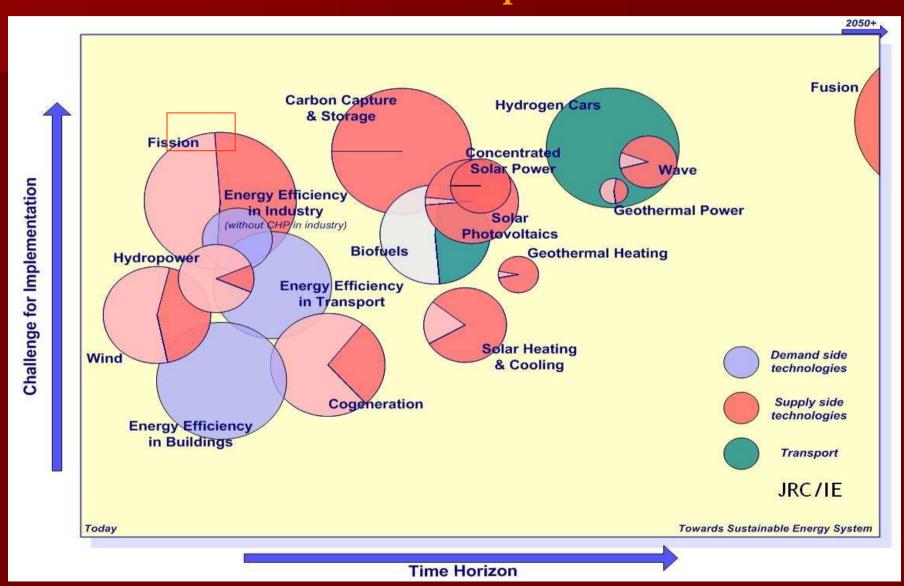


### Natural resource management

#### SUPPLY INDUSTRIES are bottle-necks

- Uranium from politically stable countries
  - Australia, Canada and Kazakhstan are among the largest producers
- Cost of uranium is very low in the total cost of power generation
- Used fuel management: SET plan

# Supporting nuclear research: SET-plan



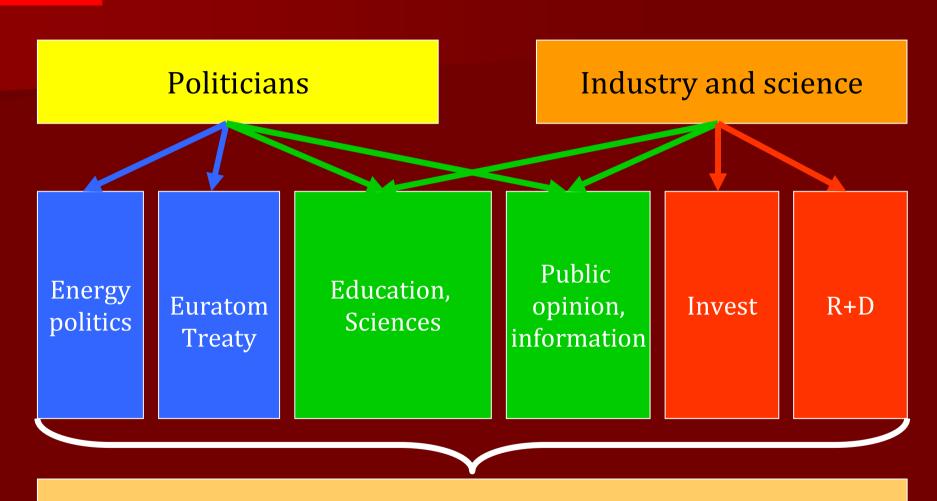
# Knowledge Management

#### **HUMAN RESOURCES** are bottle-necks:

- Skilled workforce
  - Training of skilled craft workers
  - Engineers and operators
- Digital turnover
  - Enhanced safety and risk management
  - Advanced technology
  - Emphasis on qualified engineers and technicians
- Cyber security
  - Feature to provide improved security



#### How to achieve this?



European and global cooperation the continued production and delivery of end-use



If you are serious about doing something about climate change you can not ignore nuclear energy!

Nuclear energy needs public tolerance and political support!

High time for cooperation, solutions, investment and responsible thinking

Many thanks for your attention!

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