

## Intervention Paper No 9

### Challenges and key questions about European energy policy

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*This series of 'intervention papers' is hosted by SERI in order to give a platform to individual experts for giving a personal contribution to on-going review debates of the EU Strategy of Sustainable Development. As a rule, they have been inspired by debates within the thematic network 'Sustainability Strategy', funded within the 5th Framework Program. As a personal contribution of their authors they do not engage SERI or the network in any way.*

#### **Thematic Network 'Sustainability Strategy'**

The objective of the Thematic Network is to use the diversity of scientific approaches to the problems of sustainability as a resource for improving the European sustainability strategy, especially its further elaboration and implementation. This requires the creation of a trans-disciplinary network focused on sustainable development, bringing together technical, economic and political science insights, and capable of monitoring the European sustainability strategy, while building a bridge to experts and civil society networks committed to European policy co-ordination. The creation of such a thematic network would not only contribute to the achievement of sustainable development in Europe, including the policy co-ordination objectives of dynamic economic development, full employment and stronger social cohesion and of integration of environmental issues into all policies. Its functioning as an integrated discursive space would furthermore strengthen the governance structure of the European Union, by making it more accessible to its citizens, and reinforce the basis for a constructive role of the EU in global partnership.

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## Introduction

Fossil fuels still dominate the energy sector in the European Union and elsewhere as can be seen in Fig. 1 where the fuel sources of electricity generation are indicated.

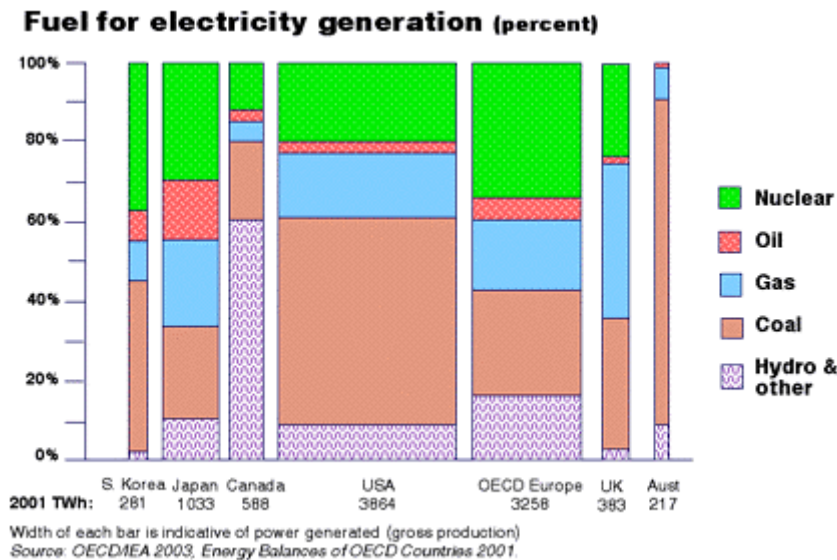


Figure 1. Electricity generation sources in selected countries/areas.

The greening of electricity industry in Europe is characterized by a multiplicity of challenges and contradictory patterns such as (Midttun, 2003):

- A mixture of global, regional and local environmental problems to be solved.
- Competition between national and EU based regulation to solve them.
- Additional rivalry between public regulatory and private commercial initiatives for shaping and providing green electricity.
- Rivalry between specialized niche-oriented and broader price-based commercial approaches.

The ecological challenges and the rapid de-regulation of energy markets set new requirements for the European Union energy policy formulation. In the White Paper of 1997, the EU laid down clear objectives for renewable energy by 2010: a share of 12 % of renewables in gross inland energy consumption. This was confirmed in 2000 in the Green Paper on the security of energy supply. The most important point in the White Paper was to set out a strategy to double the share of renewable energies in gross domestic energy consumption in the European Union by 2010, including a timetable of actions to achieve this objective in the form of an Action Plan. This intervention papers includes policy suggestions taking into account the ecological, economic and social dimensions of sustainability.

## European renewable energy strategies

In 2001 the European Union issued the Directive on the promotion of electricity produced from renewable sources (RES-E directive). This Directive sets out to create a framework that will facilitate, on the medium term, a significant increase in renewable generated electricity within the EU. The Directive set the target that 22.1% of renewable

electricity in comparison to the overall electricity consumption should be reached by 2010.

In the EU, the transport sector relies today for more than 90% of its energy on mineral oil, and a growing proportion of this will have to be imported in the future. This is unacceptable from the point of view of the future security of EU energy supply, as well as from an environmental perspective (emissions of greenhouse gases), and justifies serious efforts by all sectors of society. Moreover, global oil resources are finite and the majority are located in regions of the world, which are distant from the EU. As a result, oil prices have already shown increasing volatility in recent years, and this volatility can only be expected to increase in the future.

In May 2003, the European Parliament and the Council adopted a directive for the promotion of biofuels for transport. Its main objective is to raise the part of biofuels used for transport purposes from the current 0.6% to 5.75% by 2010. Biofuels include bioethanol, biodiesel and any fuel for transport produced from renewable energy sources.

The goal of increasing the share of renewable energy sources in energy supply as well as in electricity production in an enlarged European Union (EU-28) will be challenging one and most likely will be addressed by a mix of promotion instruments. The most prominent policies in the case of electricity are renewable energy feed-in tariffs and quota systems, tenders, energy tax exemptions, environmental funds and soft loans. In the current situation the use of these instruments is varied in different countries and that is why the harmonisation of policy instruments is needed.

EU target for renewable energy are beyond reach, unless EU Member States put extra policies and measures in place concerning energy efficiency. By reducing consumption it will be easier to obtain a larger share of renewables. Energy efficiency increase is often cheaper than increase in renewables, but strong policies in both fields are needed in order to meet e.g. the CO<sub>2</sub> emission reduction targets. Directive on the Energy Performance of Buildings (2002) is aimed to realise a savings potential of around 22% by 2010 for energy used in heating, air-conditioning, hot water and lighting. This and the proposed directive on energy end-use efficiency and energy services are steps towards the right direction.

### **Energy security and energy availability**

The EU imports 50% of its energy requirements and if no measures are taken within the next 20 to 30 years this figure will rise to 70%. An important reason for investing in renewable technologies is the predicted increase in energy import dependency and energy security questions. The main risks in the field are related to source dependency, transit dependency, facility dependency and structural risks. The energy supply crisis in Europe may be triggered by natural disasters, political blackmail, terrorism, war and civil unrest. Security technologies should gain special attention in EU energy policies.

## Energy technology and innovation policy

In current situation there are some critical technology fields which should receive special attention in EU energy policy:

- biofuel technologies
- solar energy technologies
- hydrogen technologies
- wind energy technologies
- nano technologies supporting sustainable development
- sustainable transportation systems including fuel cell technologies
- energy saving and efficiency technologies
- combined heat and power technologies
- wave and tidal energy technologies
- sustainable infrastructures.

Obviously technologies and know-how related to renewable energy systems are facing high global demand and interest. The EU-25 region will not be competitive in global markets without considerable increase of R&D investments in renewable energy technologies. Critical technology fields in this aspect are nano technology applications and hydrogen and solar technologies. The biased balance of energy research funding can be seen in Fig. 2.

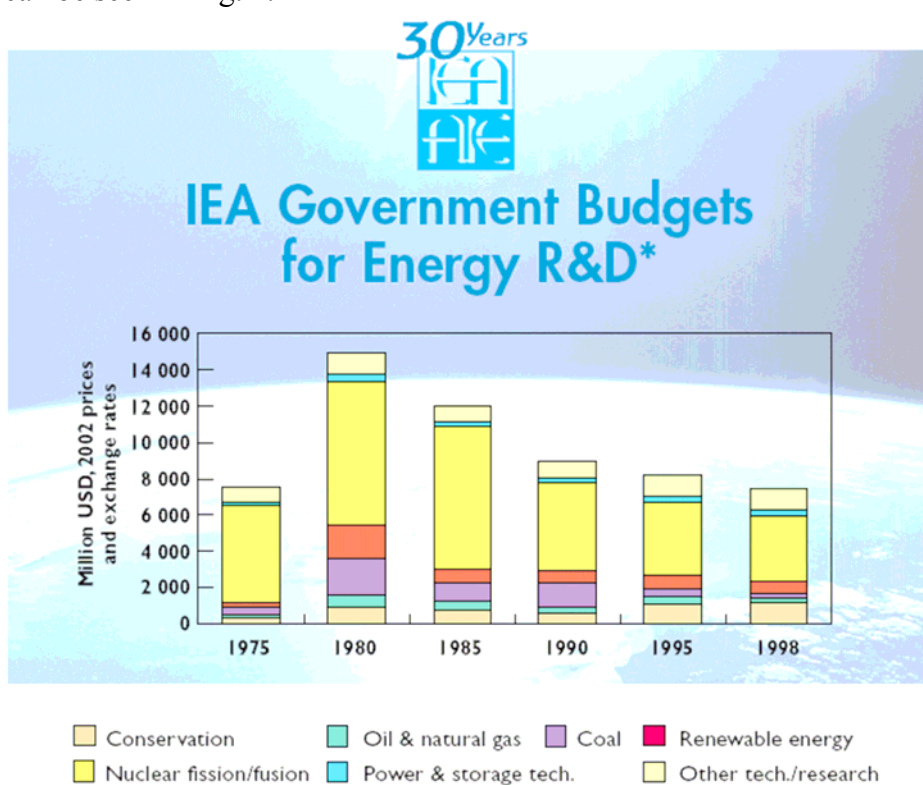


Figure 2. Allocation of funds for energy research and development by IEA member states governments.

## **Nuclear energy in the EU**

The nuclear industry currently supplies one-third of the EU's electricity. The Member States include countries with different policies on nuclear, some without any nuclear plants, some have invested heavily in the past, some plan nuclear phase-out. Currently only Finland continues investments in fission-based nuclear energy. On the other hand, nuclear energy is part of a wide debate on the security of future energy supplies in the EU, competitiveness, the single energy market, state aids and greenhouse gas emissions. In each of these issues, the views are conflicting. However, the share of nuclear (both nuclear fission and fusion) in EU's R&D budget on energy is the largest. The EU should seriously consider whether this is reasonable in the current situation or not.

Regardless of the future trends in the nuclear sector, existing nuclear installations must continue to be operated at a high level of safety and radioactive waste and stocks of spent fuel must be managed in a safe and environmentally sound manner. However, a definite solution to the direct disposal of nuclear waste does not exist. The spent fuel and other high level waste generated so far is either located in temporary storages usually on the plant sites, or reprocessed for different purposes (among them separation of plutonium used in nuclear weapons). At the end of their operating lives, nuclear facilities must be decommissioned in accordance with agreed safe practice, and high standards are required in the transport of radioactive materials.

### **Additional next steps**

Over 40% of the primary energy consumption in Europe is used for heating buildings, for domestic hot water production and for heating in industrial processes. Heat is the largest consumer of primary energy, being greater than electricity or transport. The markets for renewable heating sources (biomass, solar thermal, geothermal) therefore have a substantial potential for growth, and could replace substantial amounts of the fossil fuels and electricity, which are currently used for heating purposes. The cooling sector is steadily increasing. Since for heating and cooling applications, the end user can have an influence on the choice of energy sources, it is important to allocate sufficient effort to awareness raising campaigns and to the integration of renewable technologies like solar heating and biomass into the mainstream heating and construction industry.

Currently there is taking a place energy transformation from world powered by fossil fuels and nuclear to one running on renewable energy. The critical problem is whether energy transformation will occur rapidly enough to avoid the worst effects of warming world. One of the key questions is how coherently EU can respond to the needs of new policy formulations having to compromise between the different interests of Member States.

One fundamental idea in the EU has been economic integration and convergence policy. New challenge for the EU is to extend this integration to energy and sustainability policies. Article 6 of the European Community Treaty states that 'environmental protection requirements must be integrated into the definition and implementation of the Community policies and activities (...) in particular with a view to promoting sustainable development'. Environmental policy integration (EPI) involves a continual process to ensure environmental issues are reflected in all policymaking. This generally demands changes in political, organisational and procedural activities, so that

environmental issues are taken on board as early as possible and continuing during implementation. The product of EPI should be an overall improvement in policy and its implementation, in line with sustainable development needs. (EEA 2005)

To reach sustainability in the energy and climate policy area, the need for a comprehensive multi-level and multi-sectoral approach is needed. The European energy system has to be sustainable, secure and competitive. The achievement of these three key targets is not easy. What multi-level and multi-sectoral governance means in reality? It requires integration across:

- sectors (horizontal)
- levels (vertical)
- time (short and long term)
- scale (small/large scale)
- actors (stakeholder groups)
- knowledge forms (scientific/local knowledge)
- values (civilisations/cultures)

### **Further reading**

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