Nuclear Development and the Fuel Cycle

Nuclear Development Committee (NDC)

The NDC continues to support member countries in the field of nuclear energy policy, addressing issues of relevance for governments and the industry at a time of nuclear technology renaissance and sustained government interest in ensuring long-term security of energy supply, reducing the risk of global climate change and pursuing sustainable development.

Highlights

- A 40-year retrospective of statistical data and analyses on uranium resources, production and demand was published.
- The first international study on innovation in the nuclear energy sector, based on a comprehensive set of country reports and case studies, was completed for publication early in 2007.
- Co-operation with the International Energy Agency (IEA) was strengthened, leading to a better integration of nuclear energy issues in the global energy analyses carried out under OECD auspices. In particular, the NEA contributed to two IEA flagship publications: *Energy Technology Perspectives 2006* and the *World Energy Outlook 2006*.

Nuclear policy issues

The NDC study on innovation in the nuclear energy sector was completed in 2006 and prepared for publication early in 2007. It is based on data and information from 11 countries and 23 case studies. The study examined the special characteristics of nuclear innovation systems and investigated feedback from experience in the nuclear sector to delineate policy recommendations for enhancing their effectiveness.

In the framework of the project on nuclear energy risks and benefits in perspective, the Secretariat organised a seminar at the annual meeting of the NDC. A background document based upon a broad survey of literature on health and environmental impacts, economics and social aspects of alternative electricity generation technologies was presented and discussed by the Committee. Some members highlighted national viewpoints. The findings of the seminar will be reflected in a report for policy makers to be issued in 2007.

The study on licensing processes and nuclear energy in a competitive electricity market progressed in 2006 and received input from the NEA Committee on Nuclear Regulatory Activities (CNRA). The report is being finalised for publication early in 2007. The main objective of the project was to investigate the regulatory processes in place in various NEA countries from the viewpoint of their effectiveness in deregulated markets. The key findings from a review of regulatory experience in selected countries include: recognition/awareness by stakeholders of the challenges raised by combining effectiveness and efficiency in regulations and their implementation, and willingness to minimise potential undue regulatory

Shares of uranium resources and production (in %)

	Resources*	Production**
Australia	24.0	23
Canada	9.4	28
United States	7.2	2
Namibia	2.1	8
Niger	4.8	7
South Africa	7.2	2
Kazakhstan	17.2	10
Russian Federation	3.6	8
Uzbekistan	1.6	6
Ukraine	1.9	2
Others	21.0	4

* Identified resources recoverable at less than USD 130/kgU; ** in 2005.

burdens by means of advanced regulatory methods such as risk-informed regulation.

Strengthening its co-operation with the International Energy Agency (IEA), the NEA contributed to the drafting and review of nuclear energy sections in two major IEA books: *Energy Technology Perspectives 2006* and the *World Energy Outlook 2006*. The relative emphasis on nuclear energy in those publications reflects the renewed interest in the nuclear option in policy-making circles. The inputs from the NEA, based on the main findings from its activities and publications, help ensure that nuclear energy issues are assessed on a level playing field and integrated within the global energy analysis landscape.

The NEA also participated in the IEA in-depth energy policy reviews of Hungary, the Republic of Korea and the United Kingdom. This participation brings nuclear energy expertise to the review team and ensures that those issues are addressed in a comprehensive way in the context of the national energy policies under review.

Economics

A study on market competition in the nuclear industry was initiated towards the end of the year. It aims to examine competition in the supply of nuclear energy goods, materials and services for the whole nuclear fuel cycle, including the construction of new nuclear power plants. Some key markets will likely be selected for more in-depth analysis. In particular, given the anticipated increase in demand for new nuclear power plants and associated materials and services over the coming decade, the study will examine possible constraints on expansion of supply.

Technology

At the request of the French authorities, an international peer review of the results of the French R&D programme on partitioning and transmutation was organised by the NEA. The main findings, conclusions and recommendations of the review were presented to the French authorities and published. The peer review covers a number of topics of general relevance for member countries interested in sustainable approaches to the back end of the fuel cycle.

Nuclear power plant lifetime extension is becoming a routine operation and has proven to be a cost-effective way to maintain or increase the contribution of nuclear energy to electricity generation in many NEA countries. The study on *Nuclear Power Plant Life Management and Longer-term Operation*, published in 2006, builds on previous work carried out under NDC auspices. Based on the information provided by eleven member countries and two international organisations, the study presents statistics and current trends relating to the extended, longer-term operation of nuclear power plants. Findings from the study include the recognition of ageing phenomena and their potential impacts on safety, but it concludes that the extended operation of existing nuclear power plants offers significant economic advantages, contributes to security and stability of electricity supply, maintains the diversity of energy resources and reduces the risk of climate change. Finally, the report highlights the potential role of longer-term operation as a bridge between the present and future generations of reactors.

With the renewed interest for nuclear energy and the perspective of significantly expanding the installed nuclear capacity in the coming decades, recycling fissile and fertile material inventories is attracting increasing attention from policy makers. A study carried out under NDC auspices during 2005-2006 and to be published in 2007 covers strategic and policy issues associated with the management of recyclable materials. It provides an overview of the amounts of materials available, their state-of-the-art management options, through recycling or direct disposal, their potential value and the challenges raised by the implementation of advanced nuclear systems which could enhance the effectiveness of recycling.

Data and resource assessment

In the area of uranium resource assessment, the Joint NEA/IAEA Uranium Group continued its activities by completing the 2005 update of *Uranium: Resources, Production and Demand*, the "Red Book", and beginning preparations for the 2007 edition. Published in June 2006, the 2005 "Red Book" highlighted increased exploration and mine development efforts in many countries in response to recent increases in the spot market price for uranium. It concluded that sufficient uranium resources and production capability exist to meet future requirements, but cautioned that the long lead times needed to bring resources into production (typically in the order of ten years or more) mean that there is a potential for uranium supply shortfalls and continued upward pressure on prices, in particular if mine developments do not proceed as planned.

The Secretariat, under the leadership of past Uranium Group members, published the "Red Book Retrospective" in September 2006. The Retrospective was undertaken to compile, analyse and publish all of the key information collected in the 20 editions of the Red Book published between 1965 and 2004. It provides the most complete record of the uranium industry publicly available, along with new insights into costs of discovery, resource to production ratios and time to reach production after discovery.

The annual edition of the "Brown Book", *Nuclear Energy Data*, provides statistical data on nuclear electricity capacity and generation, as well as nuclear material and fuel cycle service production and demand in member countries. The 2006 edition offers projections to 2025 and country reports highlighting key events in the nuclear energy field.

Contact: Stan Gordelier
Head, Nuclear Development Division
+33 (0)1 45 24 10 60
stan.gordelier@oecd.org