

Nuclear Development and the Fuel Cycle

Nuclear Development Committee (NDC)

Alongside pursuing its ongoing role as an authority on the economics, resources and technology of nuclear energy, the NDC is incorporating two new dimensions into its work. The first concerns the review of the nuclear energy option in the context of competitive electricity markets. The second stems from a revival of interest in nuclear energy as a potentially attractive option for enhancing security of supply and environmental protection.

Nuclear policy issues

NDC work in the field of nuclear energy and sustainable development served as a basis for NEA contributions to major international meetings on this topic held in 2001 including the OECD Ministerial meeting and Forum 2001 and the United Nations Committee on Sustainable Development (CSD) meeting in preparation of "Rio +10". The results and findings of NEA analyses were commented and debated in those international fora where the benefits and challenges of nuclear energy were addressed by policy makers and other stakeholders. A number of recommendations for future Agency work, in particular on indicators of sustainable development in the nuclear energy sector, emerged from those discussions.

Recognising that getting the prices right is a prerequisite for energy market mechanisms to work effectively towards the development of sustainable energy mixes, the NEA and the IEA jointly organised a workshop on "Externalities and Energy Policy: The Life Cycle Analysis Approach". Policy makers from governmental bodies and the industry participated in the meeting and discussed the role and limitations of external cost valuation, in particular through life cycle analysis, in policy making for the energy sector. The proceedings from the workshop will be published on the websites of the two agencies and issued by the NEA as a free report early in 2002.

Management of Depleted Uranium was published in 2001, presenting the main findings and conclusions of a study carried out under joint NEA and IAEA auspices. The report provides information on inventories and potential uses of depleted uranium, highlights key issues for consideration by governments and policy makers and explores ideas for international co-operation in the field.

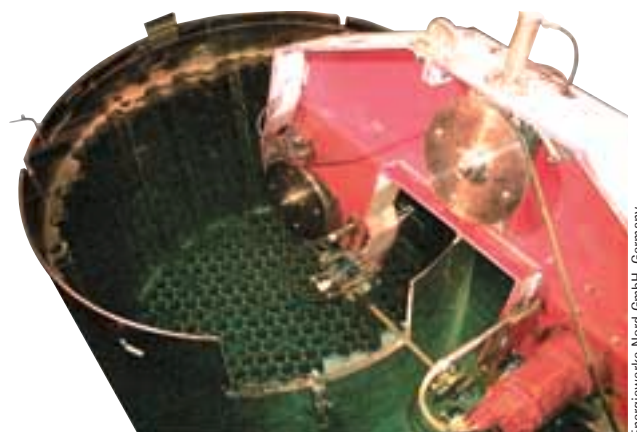
As the social dimension is playing an increasingly important role in the nuclear energy policies of Member countries, the NDC initiated a study on society and nuclear energy, examining in particular public perception of the related risks and benefits. The first phase of the study, an in-depth review of authoritative literature and expert opinions on the topic, was completed in 2001. The outcomes compiled during a desk study highlight a number of issues that need further analysis to better assess ways and means of improving

communication with various stakeholders on nuclear energy matters and broadening public participation in the decision-making process. The NDC will continue to work on this topic in 2002 and beyond in order to identify driving factors and eventually point to good practice. Further details are available on this activity in the section "Nuclear Energy and Civil Society".

The NEA participated in several in-depth energy policy reviews carried out by the IEA in countries where nuclear energy forms a significant part of the supply mix. In 2001, the countries concerned were the Czech Republic, the Republic of Korea, Spain and the United States.

Economics

In most OECD Member countries where nuclear energy programmes started in the 1960s and 1970s, the ageing of nuclear power plants is an important issue. Plant life management and extension was investigated by the NDC in its previous work programme. In 2001, a study on decommissioning policies, strategies and costs was initiated. The main objectives of the study are to collect and analyse data on the costs of decommissioning nuclear power plants and to assess the impact of national policies and industrial strategies on those costs.



Cutting the core basket during the dismantling of Unit 5 at Greifswald, Germany.

Energiwerke Nord GmbH, Germany

The study should be completed in 2002 with the publication of a report containing data, analyses, findings and conclusions.

Technology

NDC activities concerning nuclear fuel cycle technologies emphasised the back-end of the fuel cycle. Owing to the renewed interest of Member countries in innovative nuclear systems, this work received high priority.

A report on *Trends in the Nuclear Fuel Cycle: Economic, Environmental and Social Aspects* was completed. The study carried out by a group of experts from governmental agencies, the nuclear industry and research laboratories reviewed developments in the nuclear fuel cycle that may further improve the competitiveness and sustainability of nuclear energy systems. The report complements other NEA publications on nuclear energy and sustainable development and provides findings of interest to policy makers as well scientific and technical experts.

The proceedings of the Sixth Information Exchange Meeting on *Actinide and Fission Product Partitioning and Transmutation*, held in Madrid, Spain in December 2000, were published. The publication, jointly issued by the NEA and the European Commission, includes a CD-ROM containing the 79 papers presented during the meeting as well as a book summarising the key issues addressed by the experts, and the findings and conclusions of the discussions. It provides a comprehensive review of the state of the art and new developments in P&T activities, and highlights key aspects relevant for policy makers in charge of planning R&D programmes in the field.

A study on innovative reactor development, undertaken jointly by the IEA, the IAEA and the NEA, was completed in 2001. The "Three Agency Study" reviews how some of the innovative nuclear fission technologies under development attempt to address the challenges facing nuclear energy. A summary report entitled *Innovative Nuclear Reactor Development: Opportunities for International Co-operation*, based upon information provided by designers and research laboratories, and compiled and analysed by the Secretariats of the three agencies, investigates how innovative technologies could help overcome existing challenges and how international co-operation could reduce the time and cost needed to make them available on the market.

Renewed interest in nuclear energy in several Member and non-member countries has led to new initiatives regarding the development of innovative reactors and associated fuel cycles. The Generation IV International Forum (GIF), initiated by the USDOE and now carried out by ten countries (including three non-NEA member countries), aims at identifying nuclear systems meeting the sustainability, safety, reliability and economic goals of the 21st century and the R&D challenges for their deployment by 2030. During the "roadmap" phase of the project, the Agency is providing support to GIF, drawing from its expertise and the authoritative knowledge available in its reports and publications. It is anticipated that the organisational skills of the Agency will be of assistance in the second phase of the project when multinational, co-operative R&D projects will be defined and managed.

- Issues related to nuclear energy and sustainable development were addressed in several high-level meetings, including the OECD Ministerial Meeting and Forum 2001 and the UN Committee on Sustainable Development meeting. The Agency contributed to the debates, drawing from the findings and conclusions of its study on *Nuclear Energy in a Sustainable Development Perspective* published at the end of 2000.
- The Agency organised jointly with the International Energy Agency (IEA) a workshop on "Externalities and Energy Policy: The Life Cycle Analysis Approach".
- A report on *Trends in the Nuclear Fuel Cycle: Economic, Environmental and Social Aspects* was completed.
- The Agency contributed to the activities of the Generation IV International Forum (GIF), initiated by the US Department of Energy (DOE) and currently carried out by ten countries (including three non-NEA member countries).

Data and resource assessment

In the field of resource assessment and management, trends in Member countries to explicitly recognise sustainable development goals have been reflected in the work of the Agency by giving enhanced consideration to environmental issues. One example of this trend is the publication of the Joint NEA/IAEA Uranium Group report on *Environmental Remediation of Uranium Production Facilities*. The report is based on information provided by participating countries on past, ongoing and planned remediation activities at uranium mining and milling sites. It includes an in-depth expert analysis of the most relevant issues. The joint Uranium Group has prepared the 2001 edition of the "Red Book" (*Uranium 2001: Resources, Production and Demand*) and will continue to foster information exchange in this area as well as on environmental aspects of uranium mining and ore processing.

The 2001 edition of the "Brown Book", *Nuclear Energy Data*, was issued in May. The Secretariat, under the guidance of the Member countries, developed a new questionnaire for the 2002 edition of the booklet, adding requests for information on various levels of the fuel cycle and mid-term nuclear energy projections. It is expected that this will allow a more comprehensive coverage of nuclear energy data and issues in the publication.



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